

MEASUREMENT AND TECHNICAL REPORT

ORTEL CORPORATION
2015 West Chestnut Street
Alhambra, CA 91803

DATE: 14 April 1998

This Report Concerns: Original Grant: Class II Change: X
Equipment Type: PCS5800 Hub and Antenna System, Model PS-5800PCS (B-band)
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes: Defer until: No: X
Company Name agrees to notify the Commission by: N/A
Transition Rules Request per 15.37? Yes: *No:
(*) FCC Part 2, Paragraphs 2.985, 2.989,, 2.991 and 2.993; and Part 24, Paragraph 24.238
Report Prepared by: TUV PRODUCT SERVICE
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 619 546 3999
Fax: 619 546 0364

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1 GENERAL INFORMATION

1.1 Product Description

5800 PCS Hub and Antenna System, Model PS-5800PCS (B-band)

1.2 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

- Test Performed:
- x 1. Conducted Emissions, FCC Part 2, Paragraphs 2.985, 2.989, 2.991 & Part 24, Paragraph 24.238
 - x 2. Radiated Emissions, EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters
 - x 3. Radiated Emission per FCC Part 2, Paragraph 2.993, 1 - 20 GHz
 - 4. Engineering evaluations

1.3 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 619 546 3999
Fax: 619 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

1.4 Product Information

**Single Level Current Bill of Material
4 Filter Component Information Sheets**

2 CONDUCTED EMISSION DATA

ORTEL CORPORATION
PCS 5800 Hub and Antenna System, Model PS-5800PCS (B-band)

See following page(s).

Part 2, Paragraph 2.989

3/26/98
FCC ID: LB45800PCS

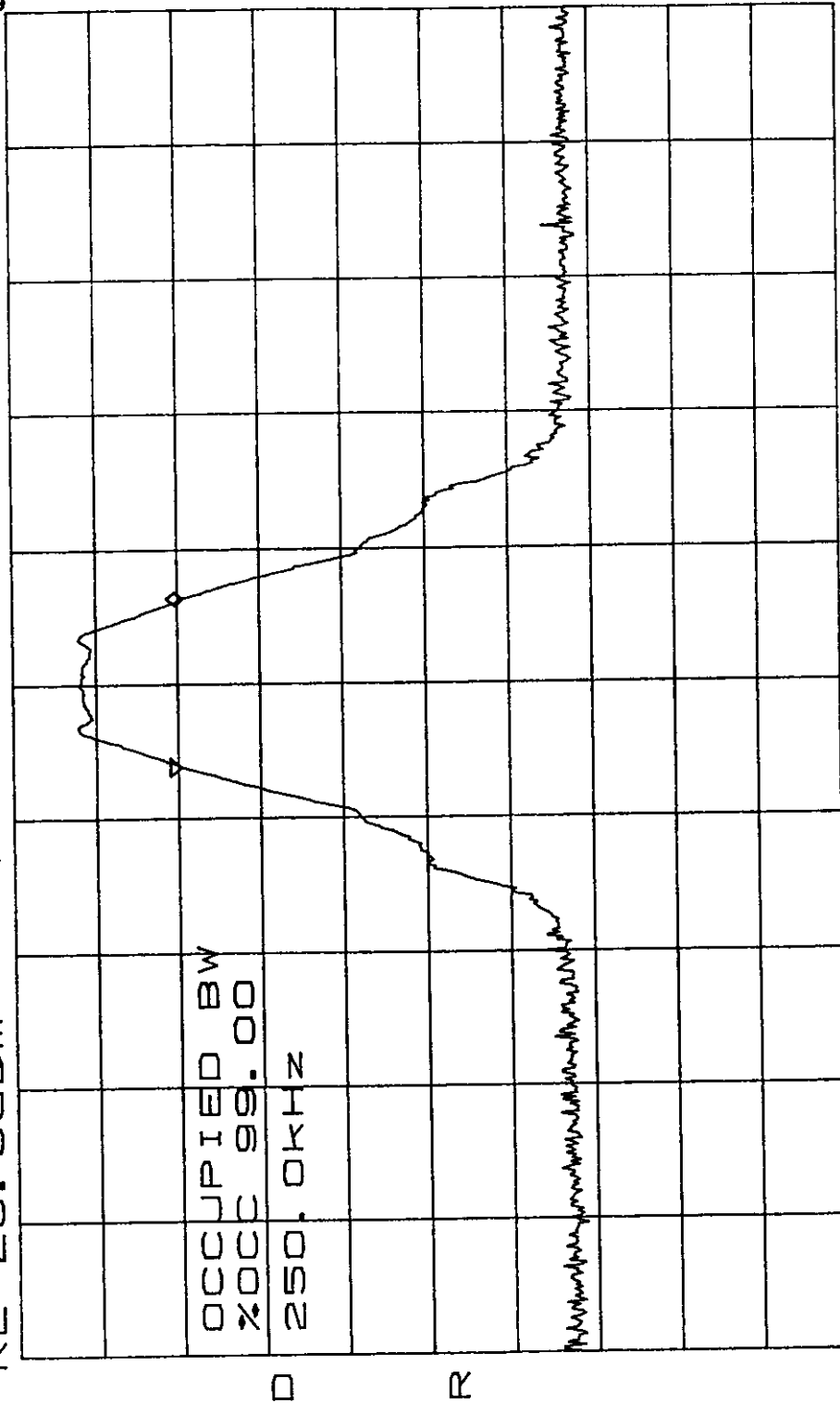
Occupied BW
Max Hold

GSM Source
for PCS 1900

ΔMKR - .34dB
250KHZ

ATTEEN 30dB
RL 20.0dBm

DL Low (B-band)
(1950.2 MHz)

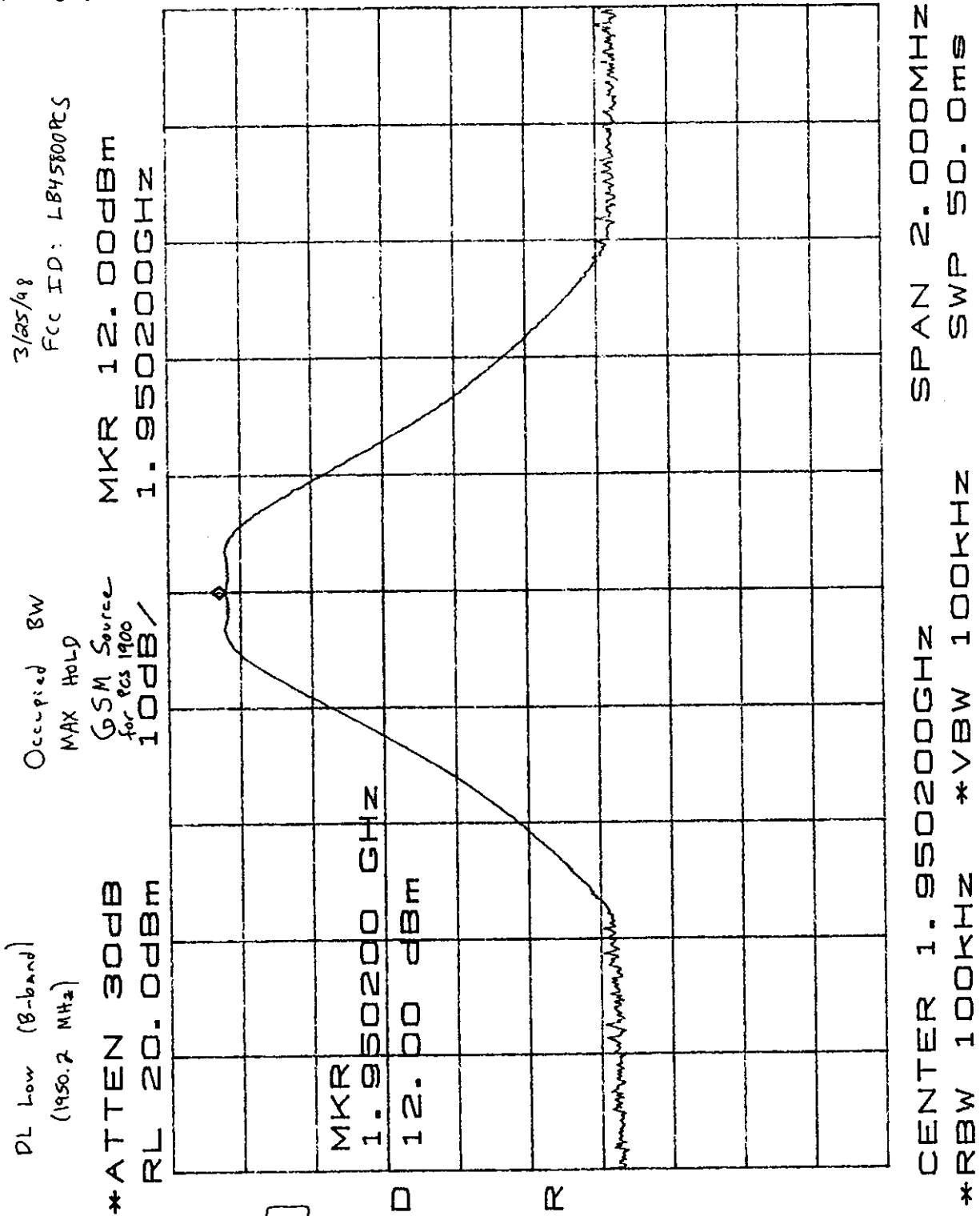


CENTER 1.950200GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 2.000MHZ
SWP 50.0ms

2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.989



2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.989

3/26/98
FCC ID: LB45800PCS

Occupied BW
Max Hold

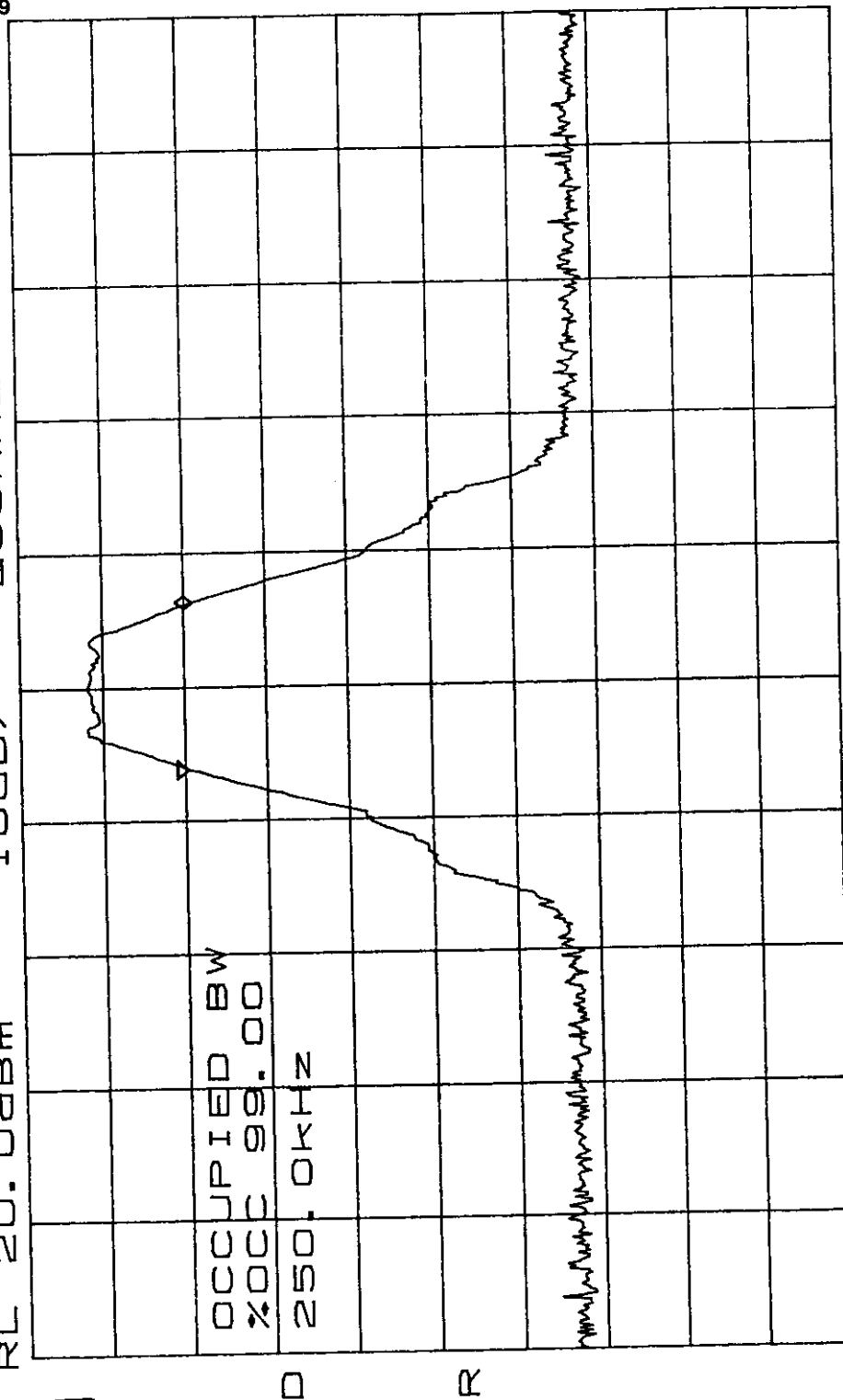
GSM Source
for PCS 1900
10dB/

ΔMKR -.67dB
250KHZ

DL Mid (B-band)
(1957.5 MHz)

ATTEN 30dB
RL 20.0dBm

OCCUPIED BW
%OCC 99.00
250.0KHZ



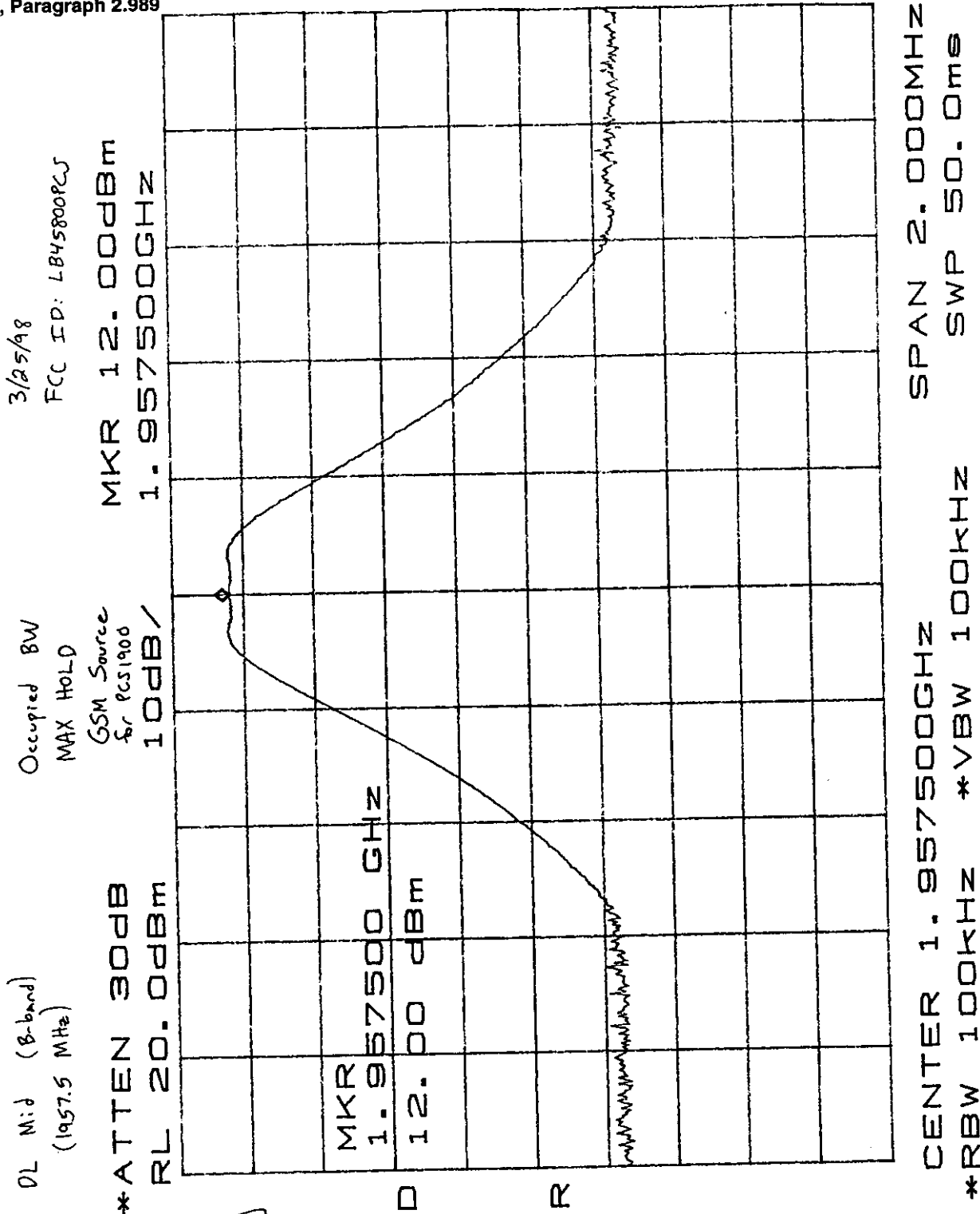
SPAN 2.000MHZ
SWP 50.0ms

CENTER 1.957500GHZ
*RBW 30KHZ *VBW 30KHZ

2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.989



2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.989

3/26/98
FCC ID: LB45800PCS

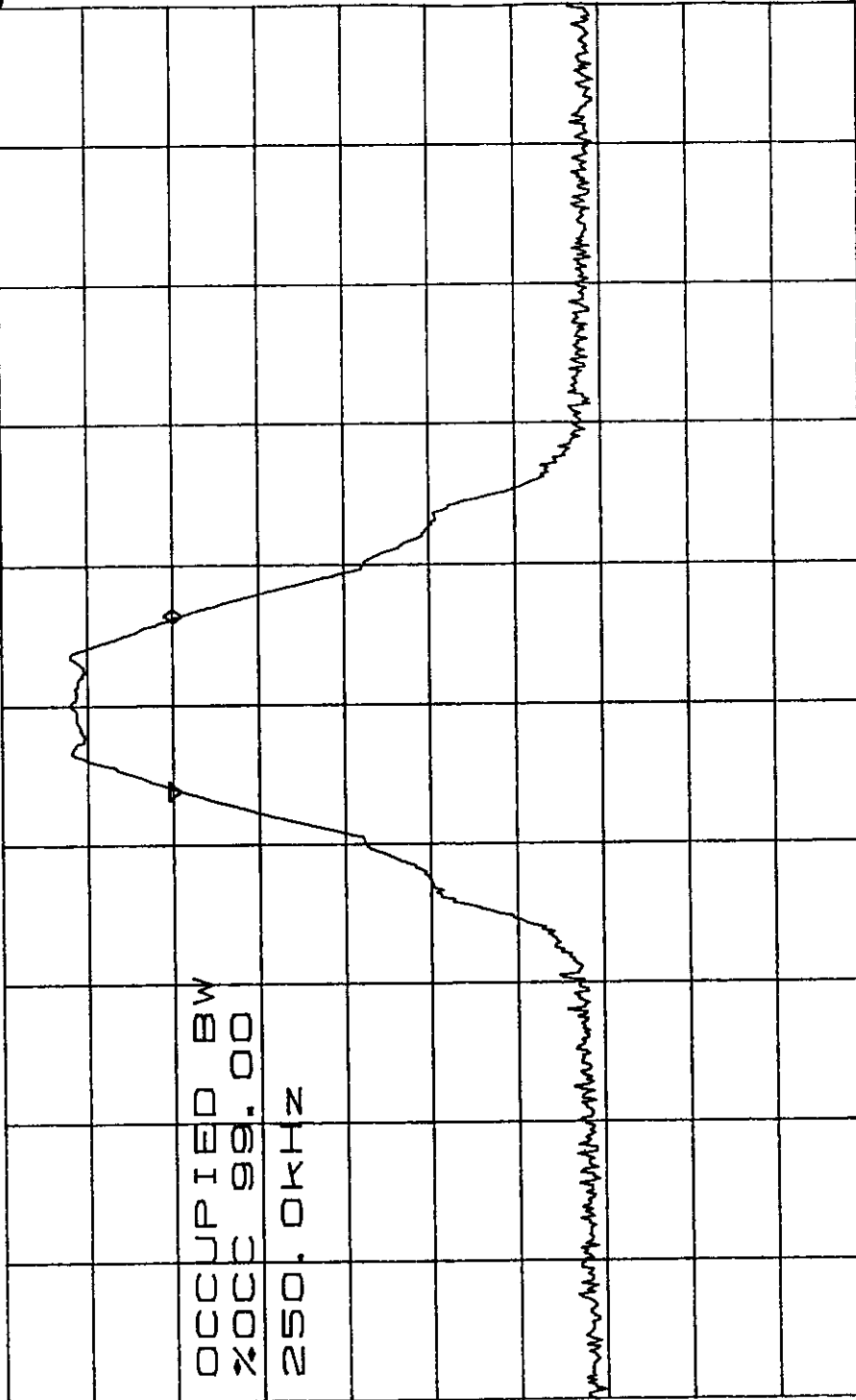
ΔMKR - .17dB
250KHZ

Occupied BW
Max Hold
GSM Source
for PCS1900
10dB/

DL High (B-band)
(1964.8 MHz)

ATTEN 30dB
RL 20.0dBm

OCCUPIED BW
%OCC 99.00
250.0KHZ



SPAN 2.000MHZ
SWP 50.0ms

CENTER 1.964800GHZ
*VBW 30KHZ

*RBW 30KHZ

2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.989

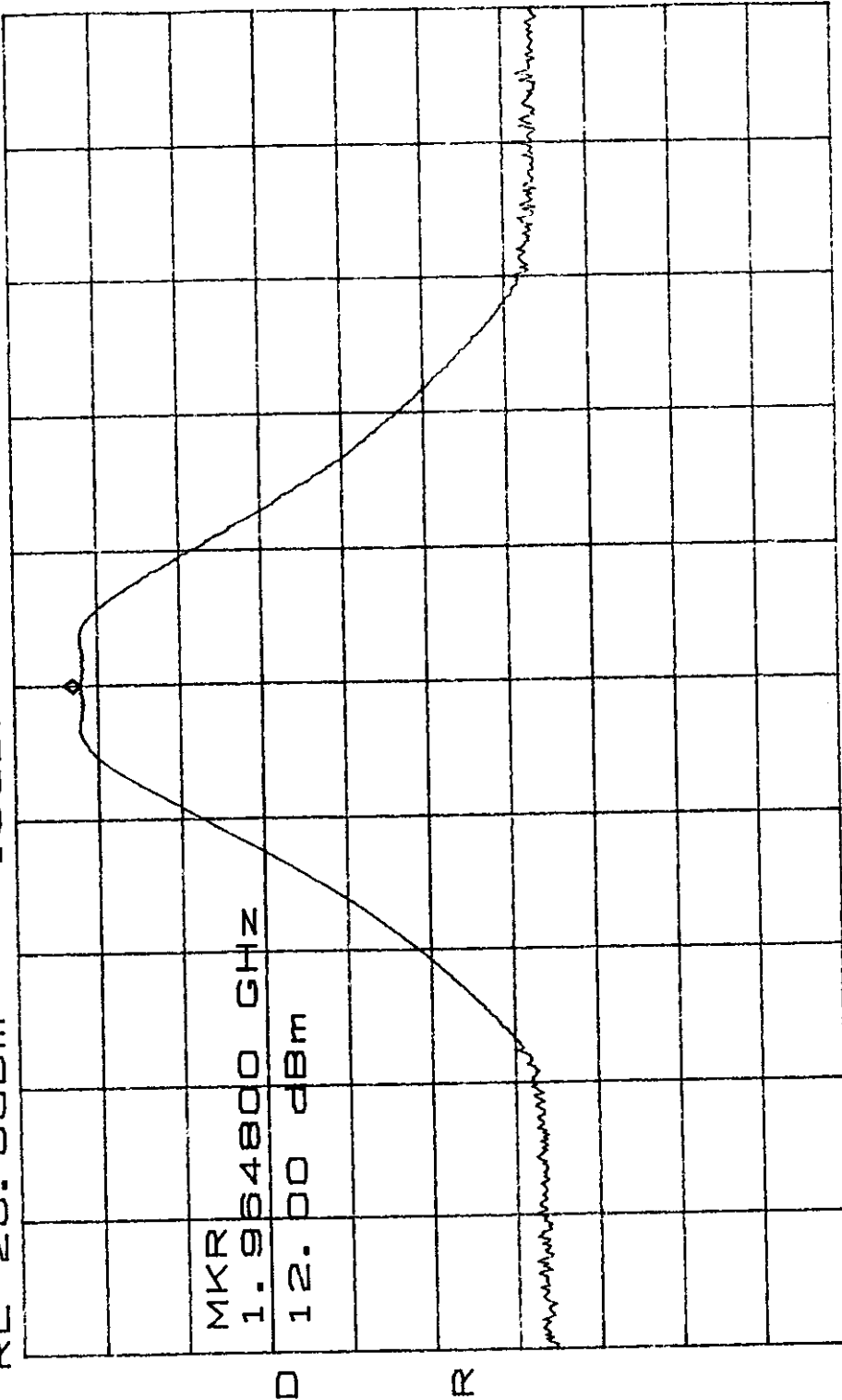
3/25/98
FCC ID: LB45800PCS

Occupied BW
MAX HOLD

GSM Source
for PCS 1900
MKR 12.00dBm
1.964800GHZ
10dB/

DL High (8-band)
(1964.8 MHz)

* ATTN 30dB
RL 20.0dBm

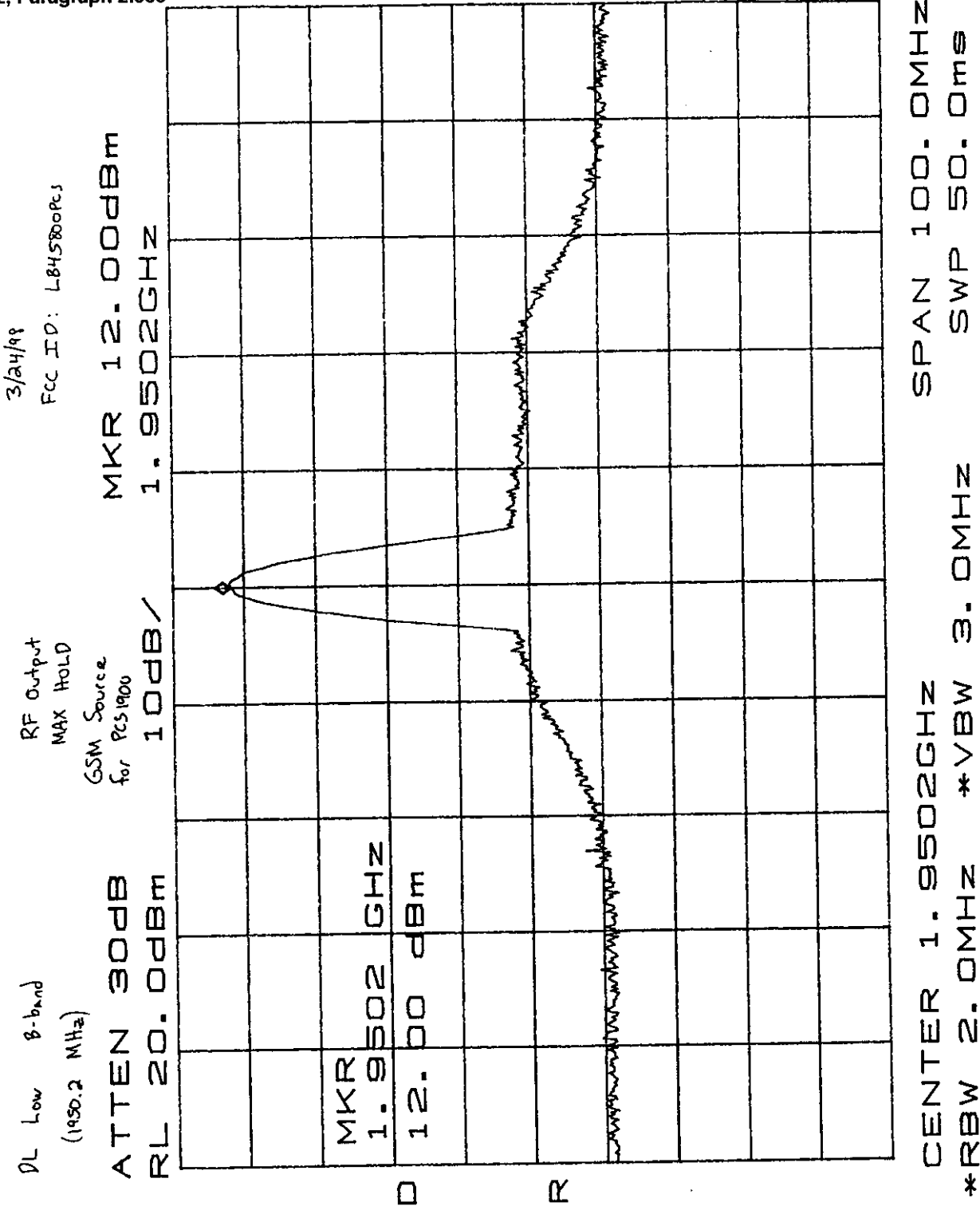


CENTER 1.964800GHZ
*RBW 100KHZ *VBW 100KHZ
SPAN 2.000MHZ
SWP 50.0ms

2.989

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985



2.985

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985

3/24/98
FCC ID: LB45800PCS

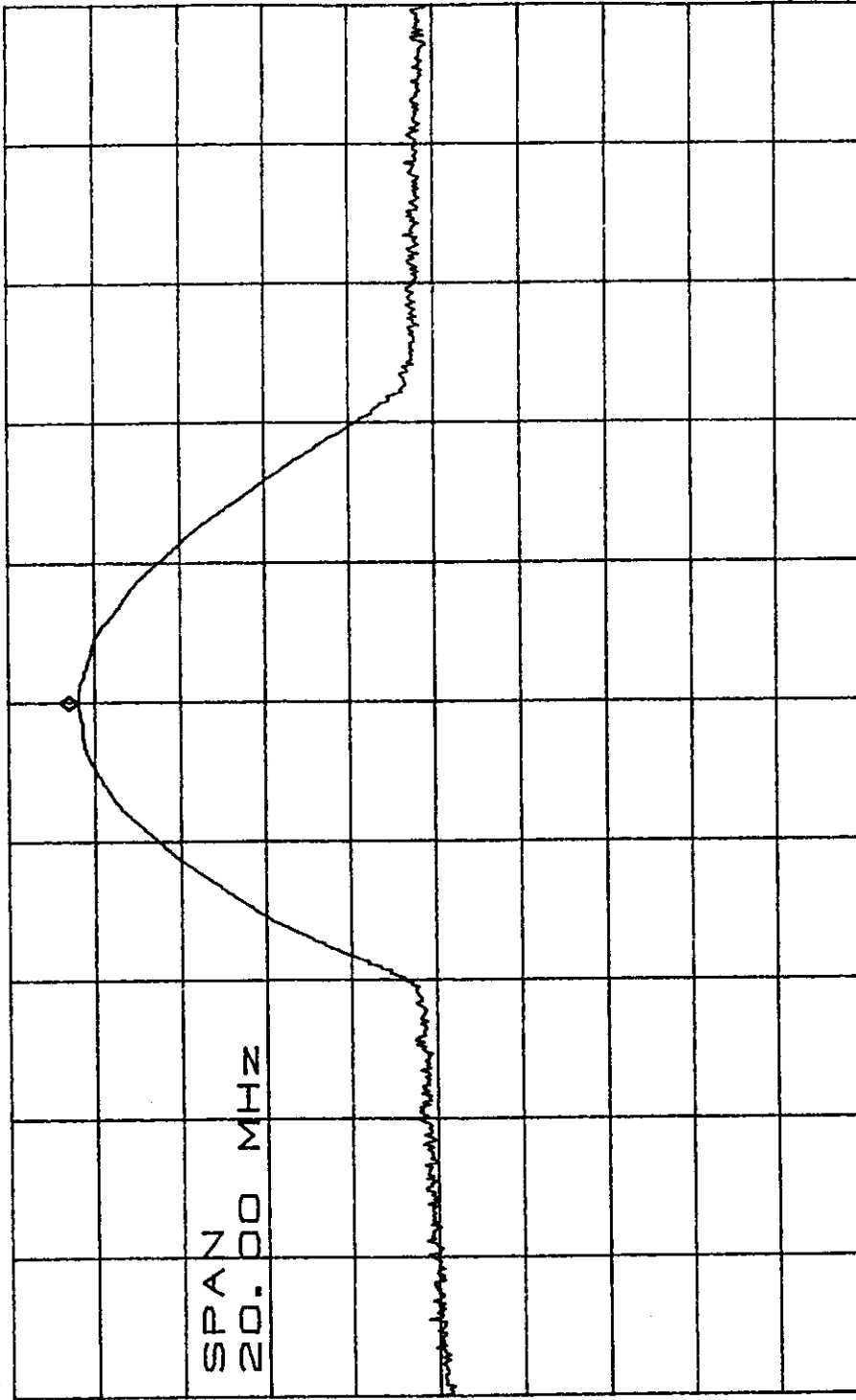
RF Output
MAX HOLD

GSM Source
for PCS1900

MKR 12.00dBm
1.95020GHZ

ATLEN 30dB
RL 20.0dBm

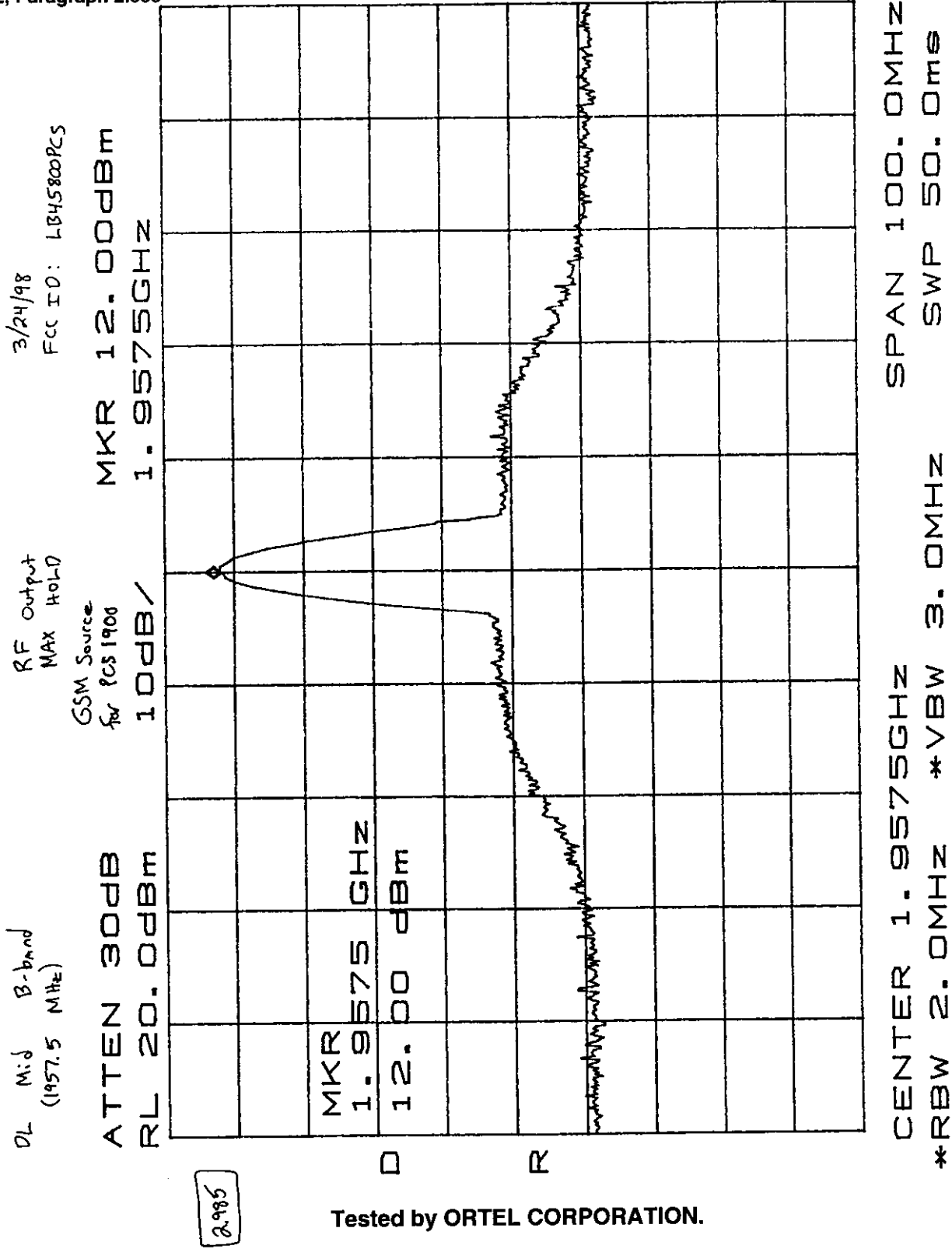
DL Low B-band
(1950.2 MHz)



2.985

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985



Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985

3/24/98
FCC ID: LB45800PCS

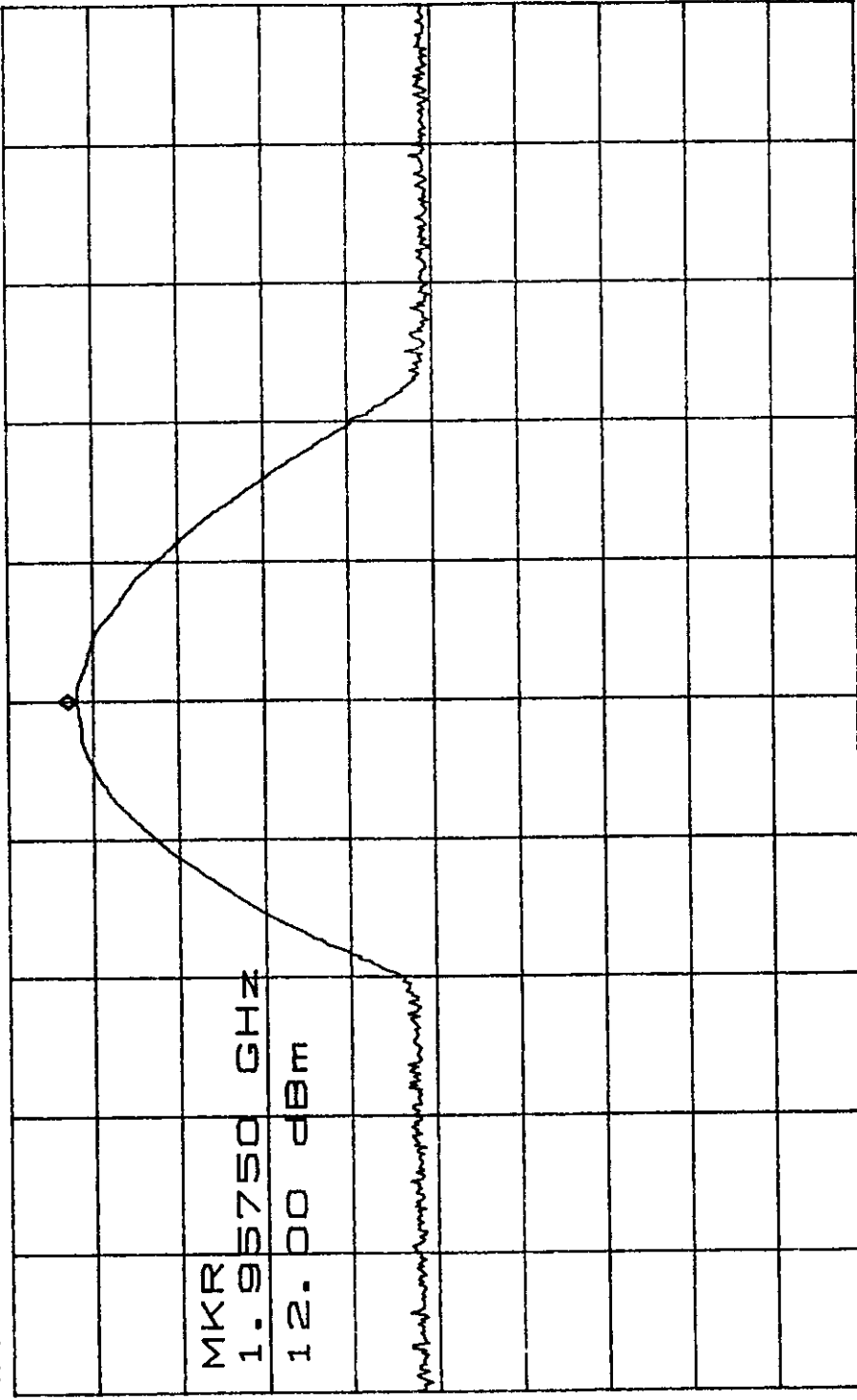
RF output
MAX HOLD

GSM Source
for PCS1900
10dB/

OL Mid Band
(1957.5 MHz)

MKR 12.00dBm
1.95750GHZ

ATTEN 30dB
RL 20.00dBm



CENTER 1.95750GHZ
*RBW 2.0MHZ *VBW 3.0MHZ
SPAN 20.00MHZ SWP 50.0ms

2.985

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985

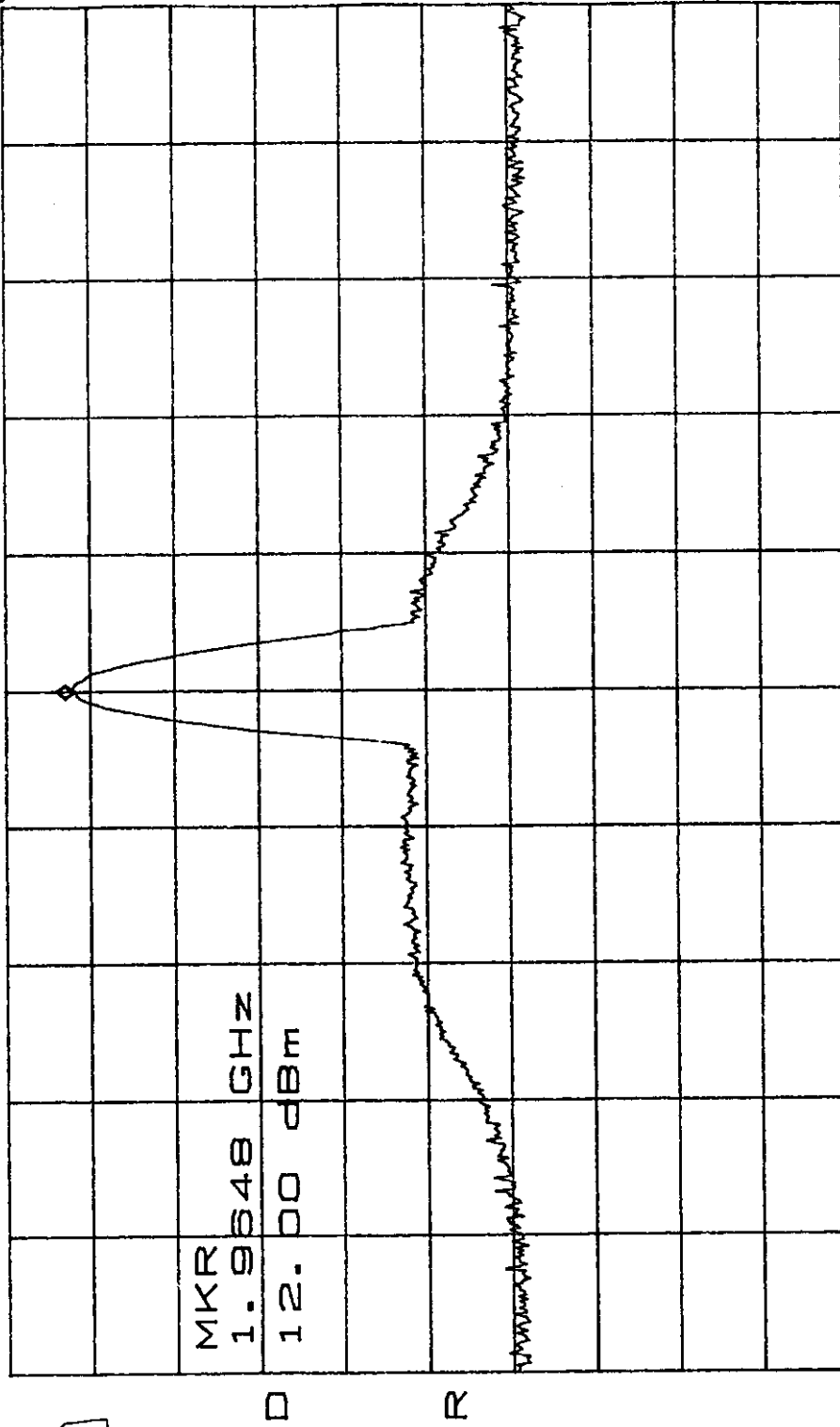
3/24/98
FCC ID: LB45800PCS

RF Output
MAX HOLD

MKR 12.00dBm
1.9648GHZ

GSM Source
for PCS 1900
10dB/

DL High B-band
(1964.8 MHz)
ATTEN 30dB
RL 20.0dBm



SPAN 100.0MHz
SWP 50.0ms

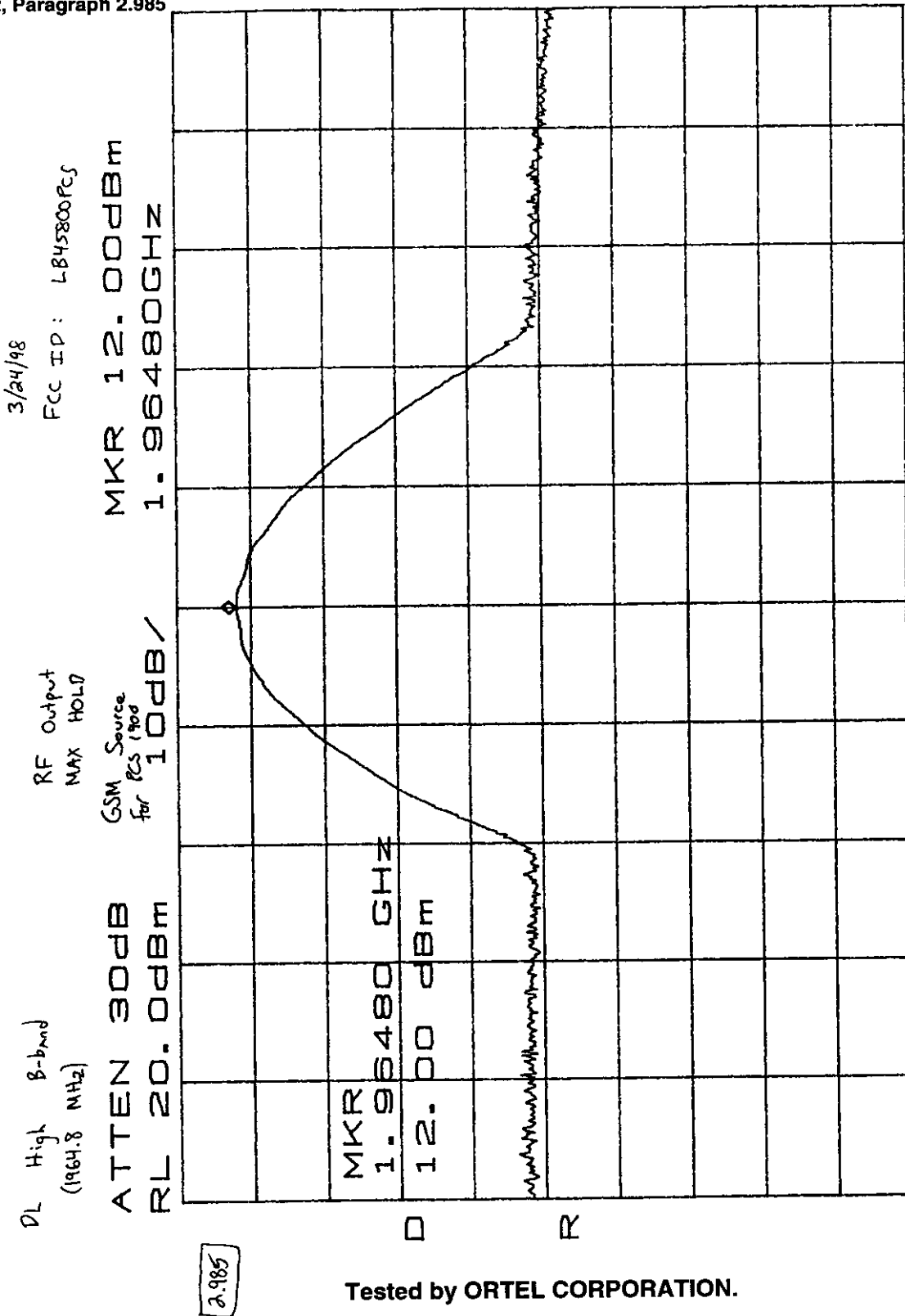
*VBW 3.0MHz

CENTER 1.9648GHZ
*RBW 2.0MHz

2.985

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.985



CENTER 1.96480GHZ
*RBW 2.0MHz *VBW 3.0MHz
SPAN 20.00MHz
SWP 50.0ms

Tested by ORTEL CORPORATION.

In/Out

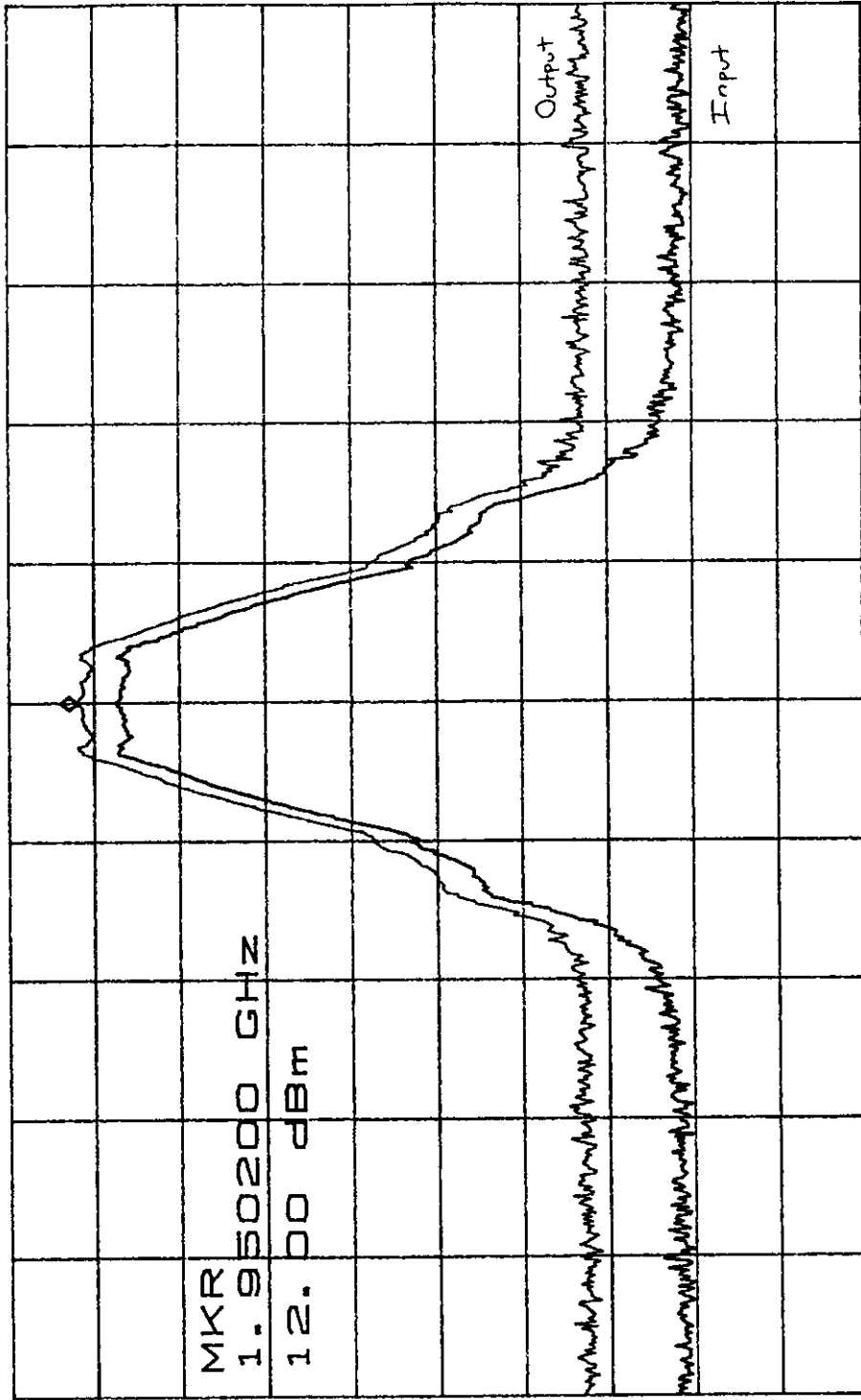
3/24/98
FCC ID: LB45800PCS
Input Source Split: 1:8

In/out
MAX HOLD

GSM Source for Pcs1900

MKR 12.00dBm
1.950200GHZ

DL Low (8-band)
(1950.2 MHz)
ATTEN 30dB
RL 20.0dBm



SPAN 2.000MHZ
SWP 50.0ms

CENTER 1.950200GHZ
*VBW 30KHZ

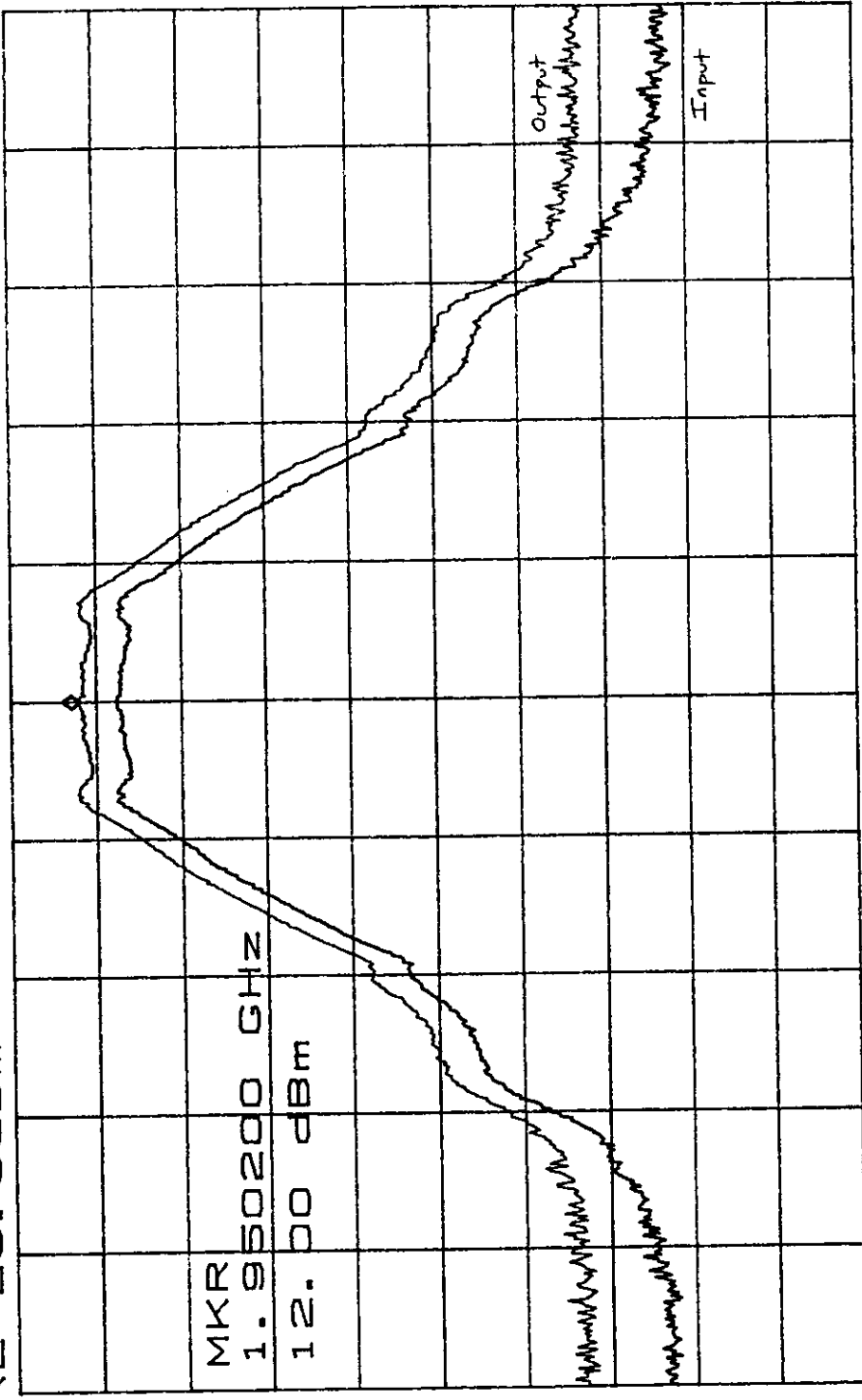
*RBW 30KHZ

In/out

Tested by ORTEL CORPORATION.

In/Out

3/24/98
 FCC ID: LB45800PCS
 Input Source Splits 1:8
 DL Low (B-band)
 (1950.2 MHz)
 In/Out Signal
 MAX HOLD
 GSM Source for PCS 1900
 MKR 12.00dBm
 10dB/
 1.950200GHZ
 ATTN 30dB
 RL 20.0dBm



In/Out

Tested by ORTEL CORPORATION.

CENTER 1.950200GHZ
 *RBW 30KHZ *VBW 30KHZ
 SPAN 1.000MHZ
 SWP 50.0ms

In/Out

3/24/98
FCC ID: LB45800PCS
Input Source Split, 1:8

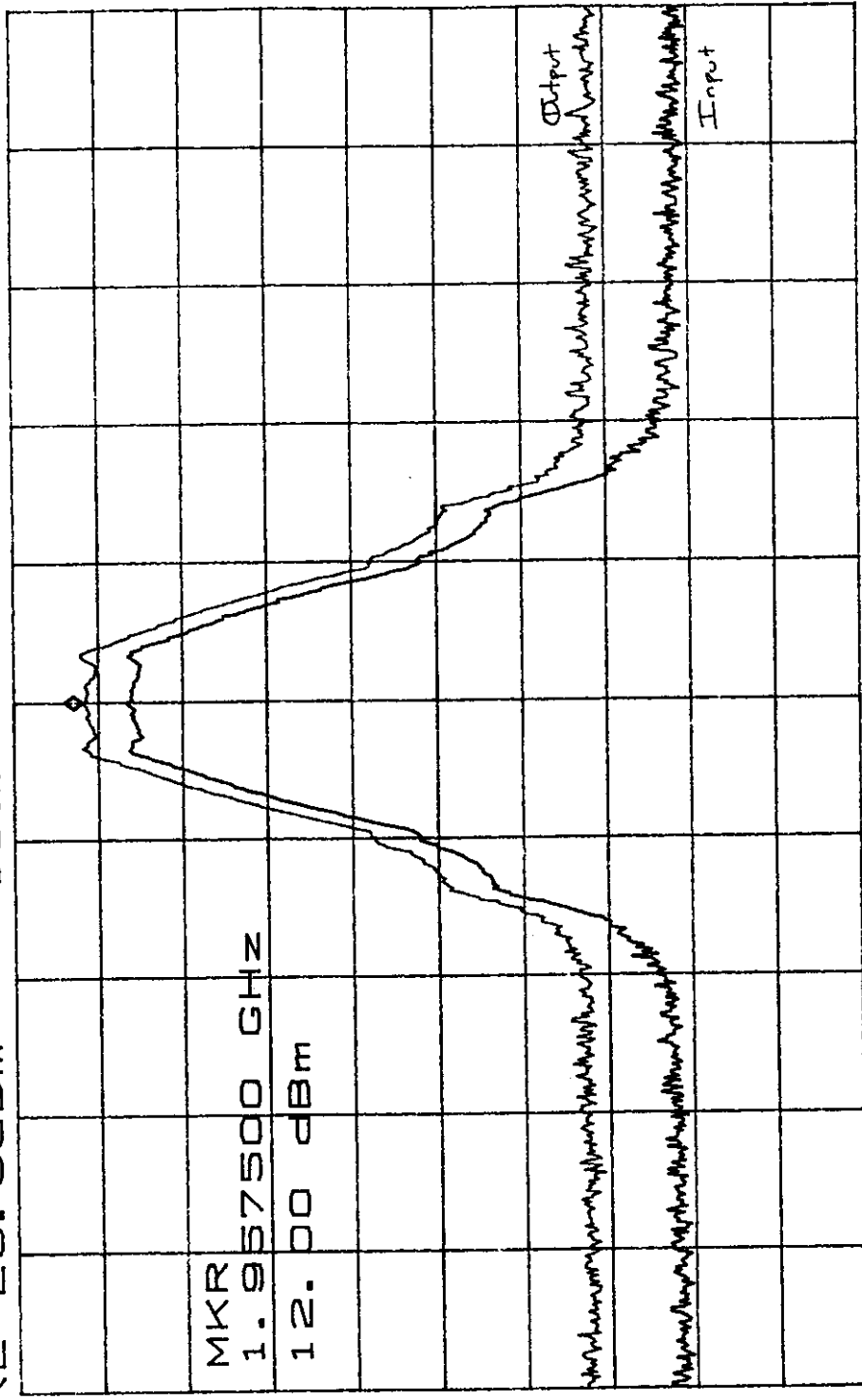
In/Out
Max Hold
GSM Source for PC1900

PL Mid (B-band)
(1957.5 MHz)

MKR 12.00dBm
1.957500GHZ

10dB/

ATTEN 30dB
RL 20.0dBm

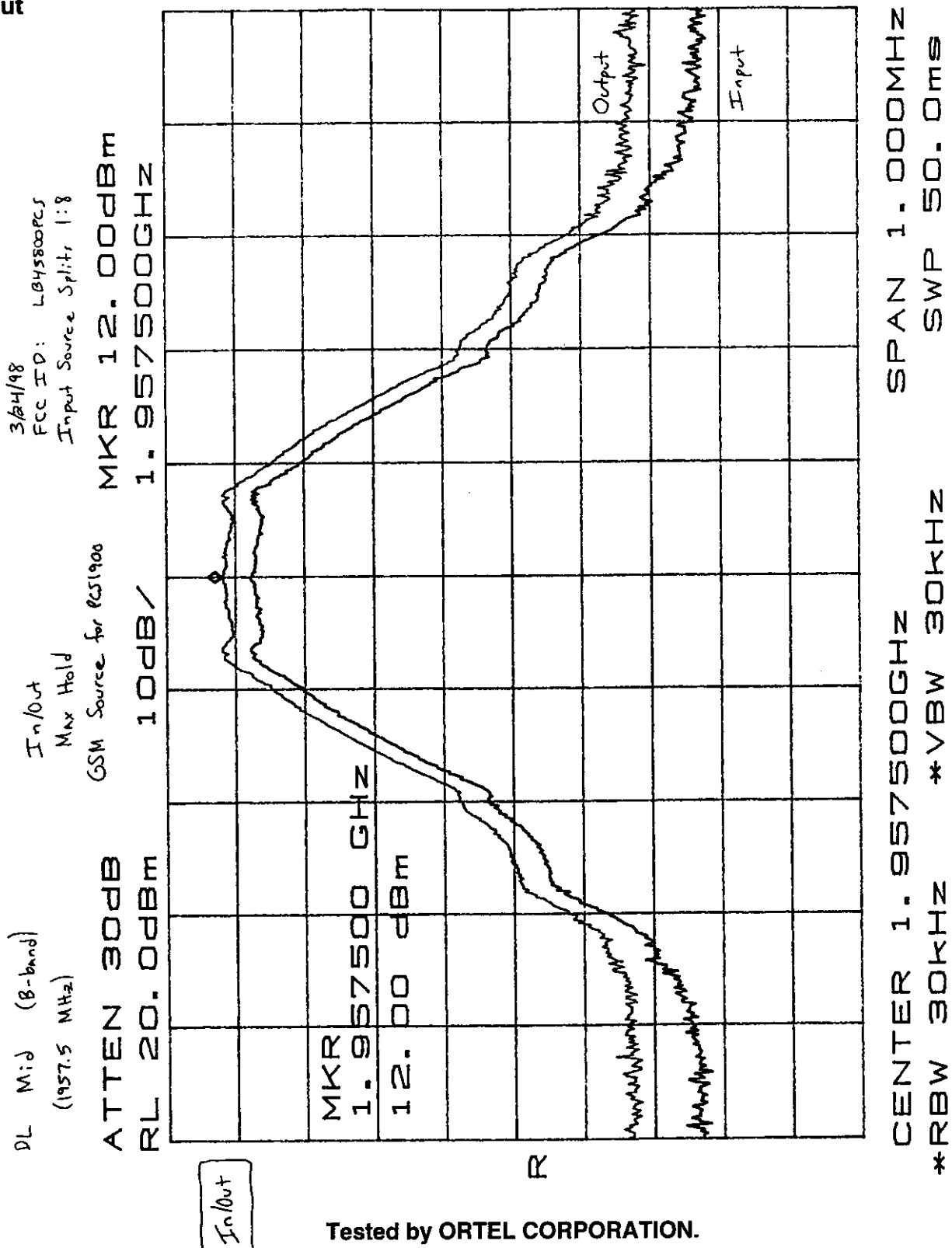


In/Out

Tested by ORTEL CORPORATION.

CENTER 1.957500GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 2.000MHZ
SWP 50.0ms

In/Out



In/Out

Tested by ORTEL CORPORATION.

In/Out

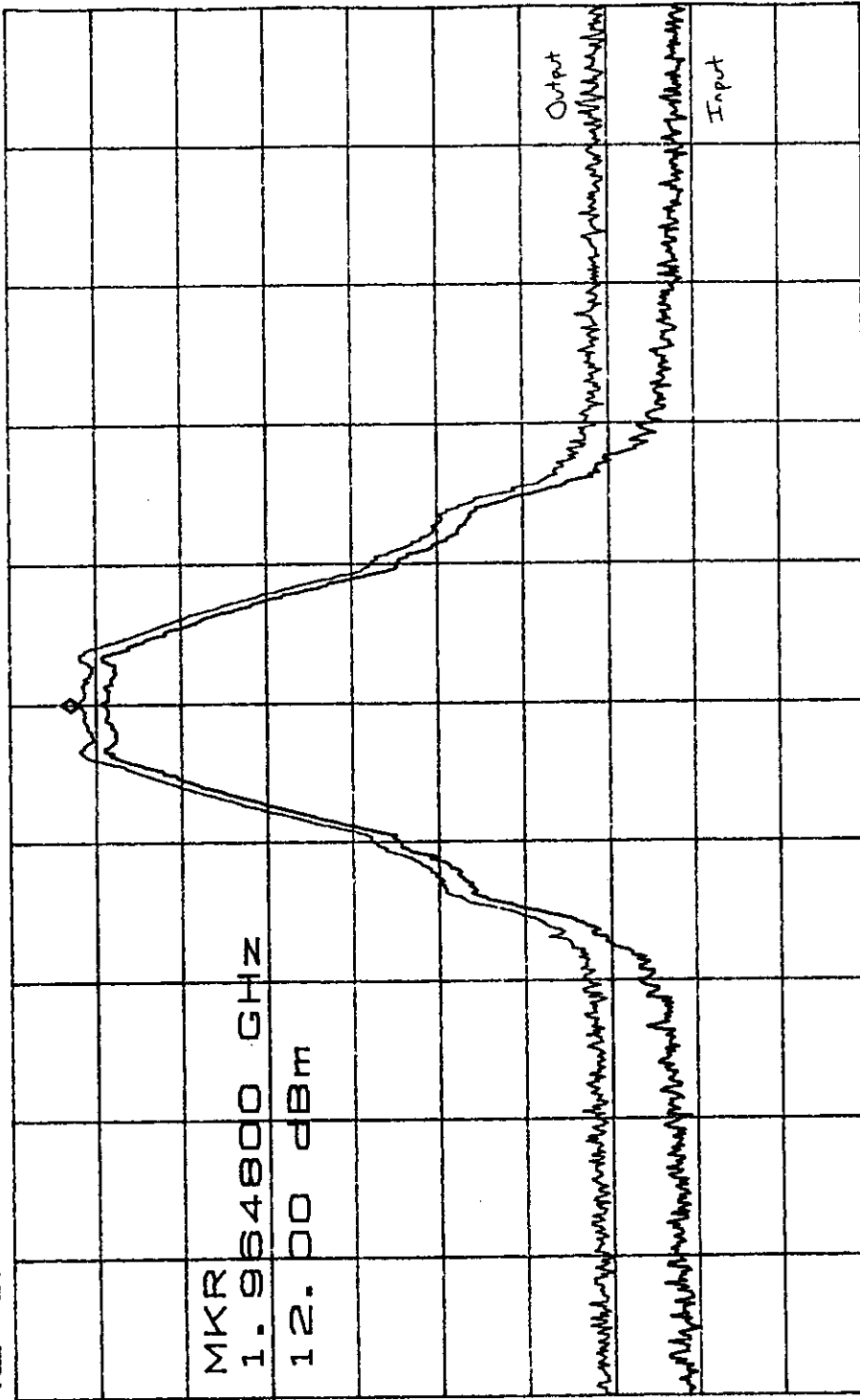
DL High (8-band)
(1964.8 MHz)

3/24/98
FCC ID: LB45800PCS
Input Source Splits 1:8

ATLEN 30dB
RL 20.0dBm

GSM Source for PCS 1900
Max Hold

MKR 12.00dBm
1.964800GHZ



CENTER 1.964800GHZ
*RBW 30KHZ *VBW 30KHZ

SPAN 2.000MHZ
SWP 50.0ms

In/Out

Tested by ORTEL CORPORATION.

In/Out

3/24/98
FCC ID: LB45800PCS
Input Source Splits 1:8

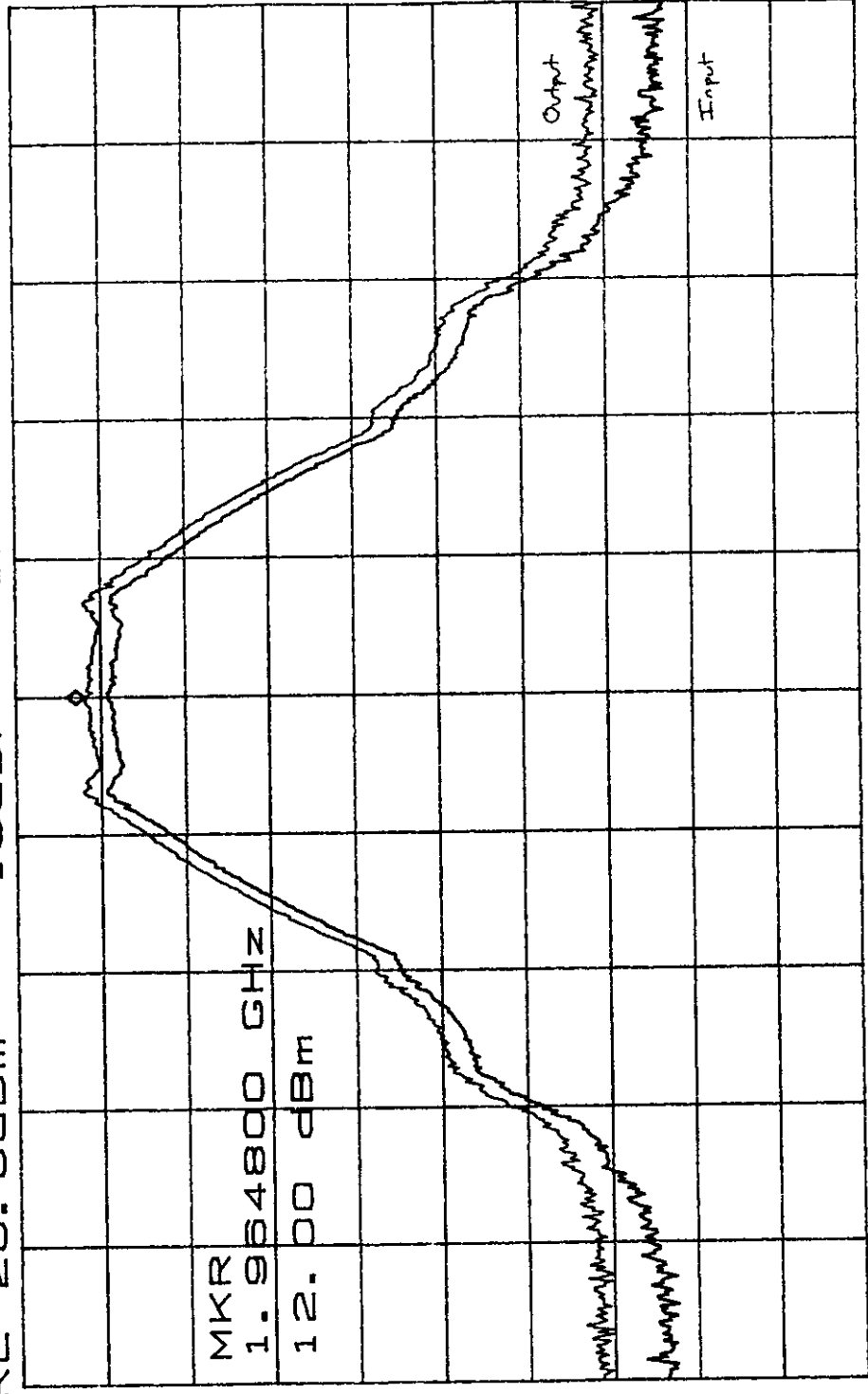
In/Out
Max Hold

GSM Source for Pcs1900 MKR 12.00dBm
10dB/ 1.964800GHZ

DL High (8-band)
(1964.8 MHz)

ATTEN 30dB
RL 20.0dBm

MKR
1.964800 GHZ
12.00 dBm



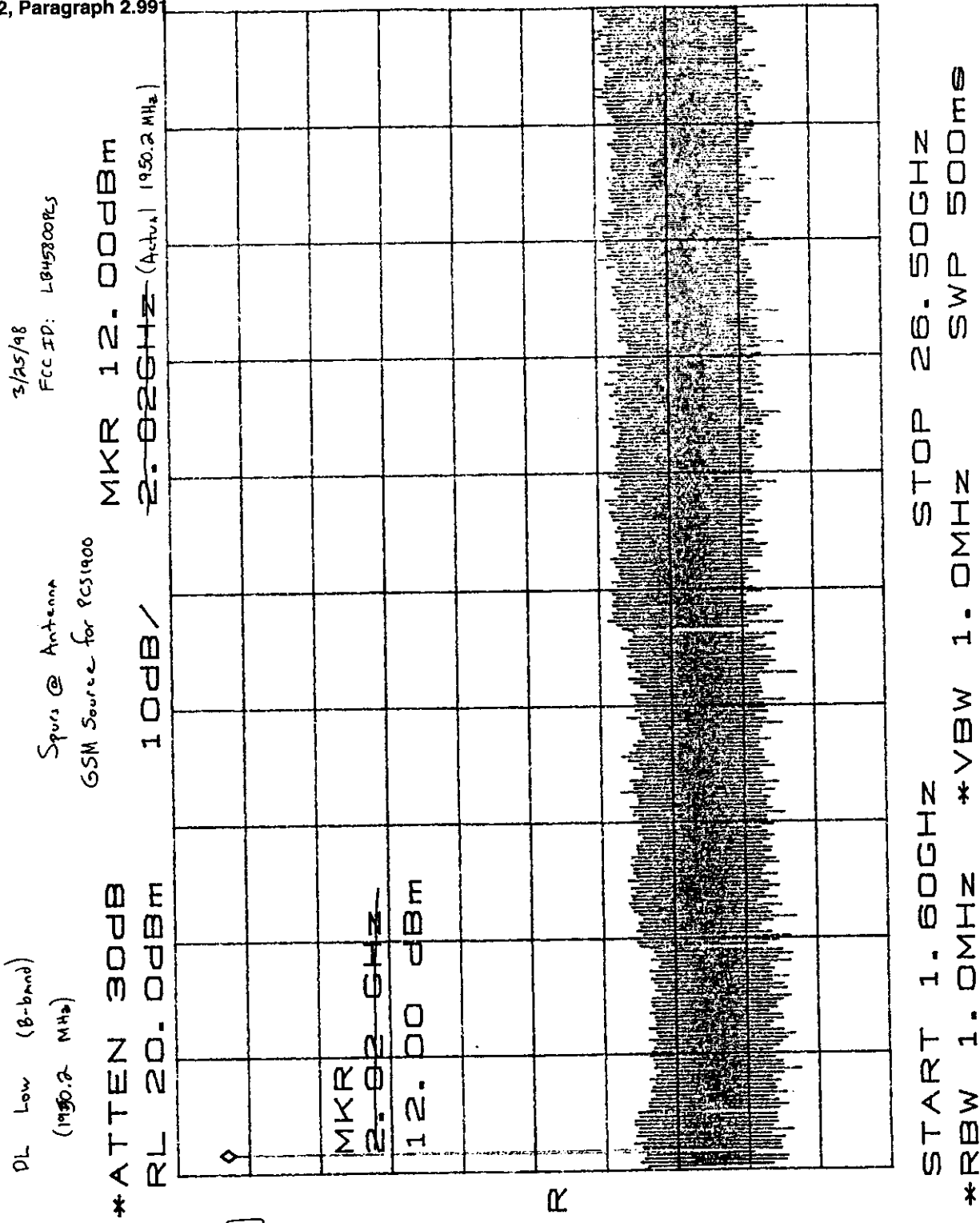
SPAN 1.000MHZ
SWP 50.0ms

CENTER 1.964800GHZ
*RBW 30KHZ *VBW 30KHZ

In/Out

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.991



2.991

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.991

DL Low (8-band)
(1950.2 MHz)

Spurs @ Antenna
MAX HOLD

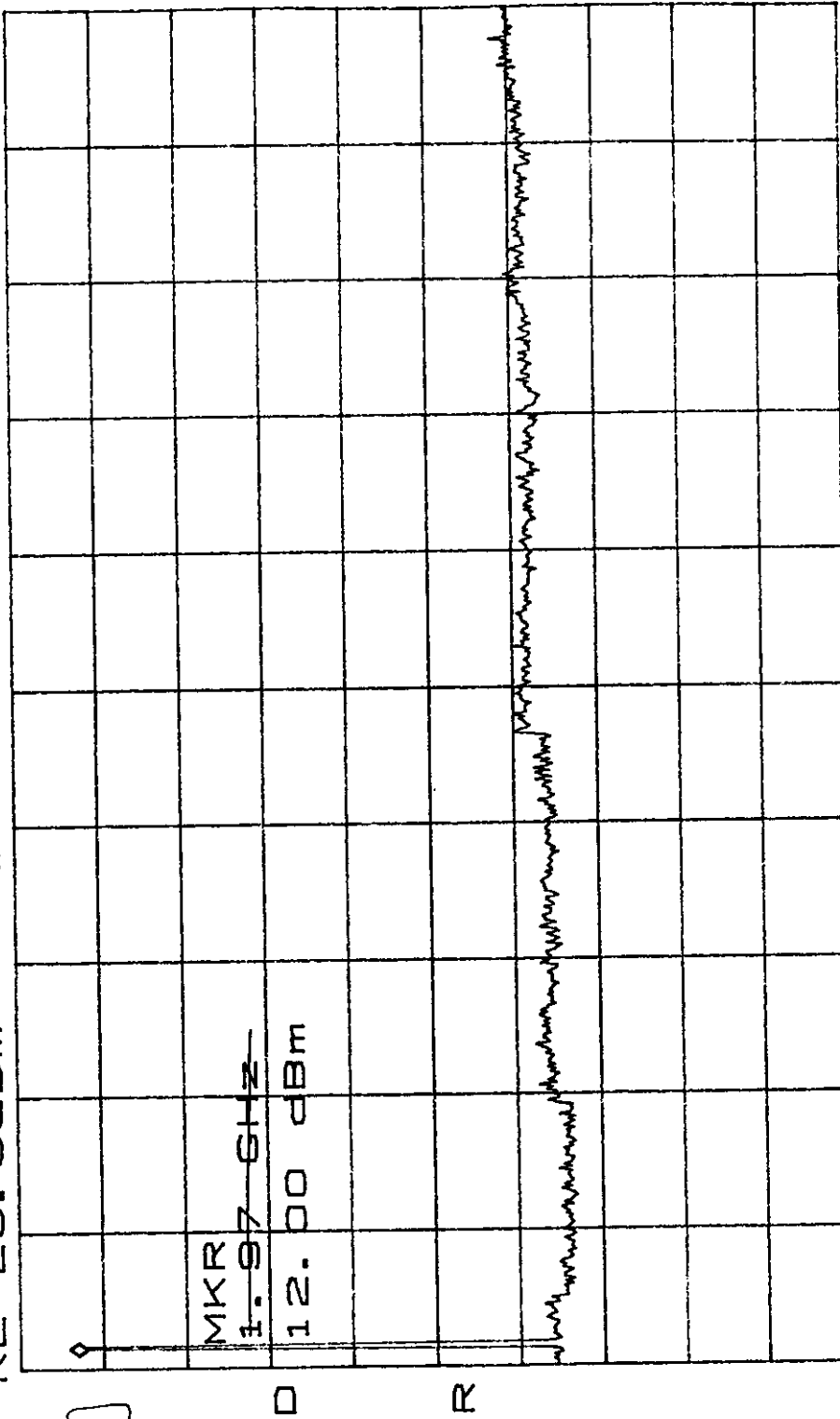
GSM Source for Pcs1900

3/25/98
FCC ID: LB45800PCS

*ATTEN 30dB
RL 20.0dBm

MKR 12.00dBm
~~1.976GHz~~ (Actual = 1950.2 MHz)

10dB/

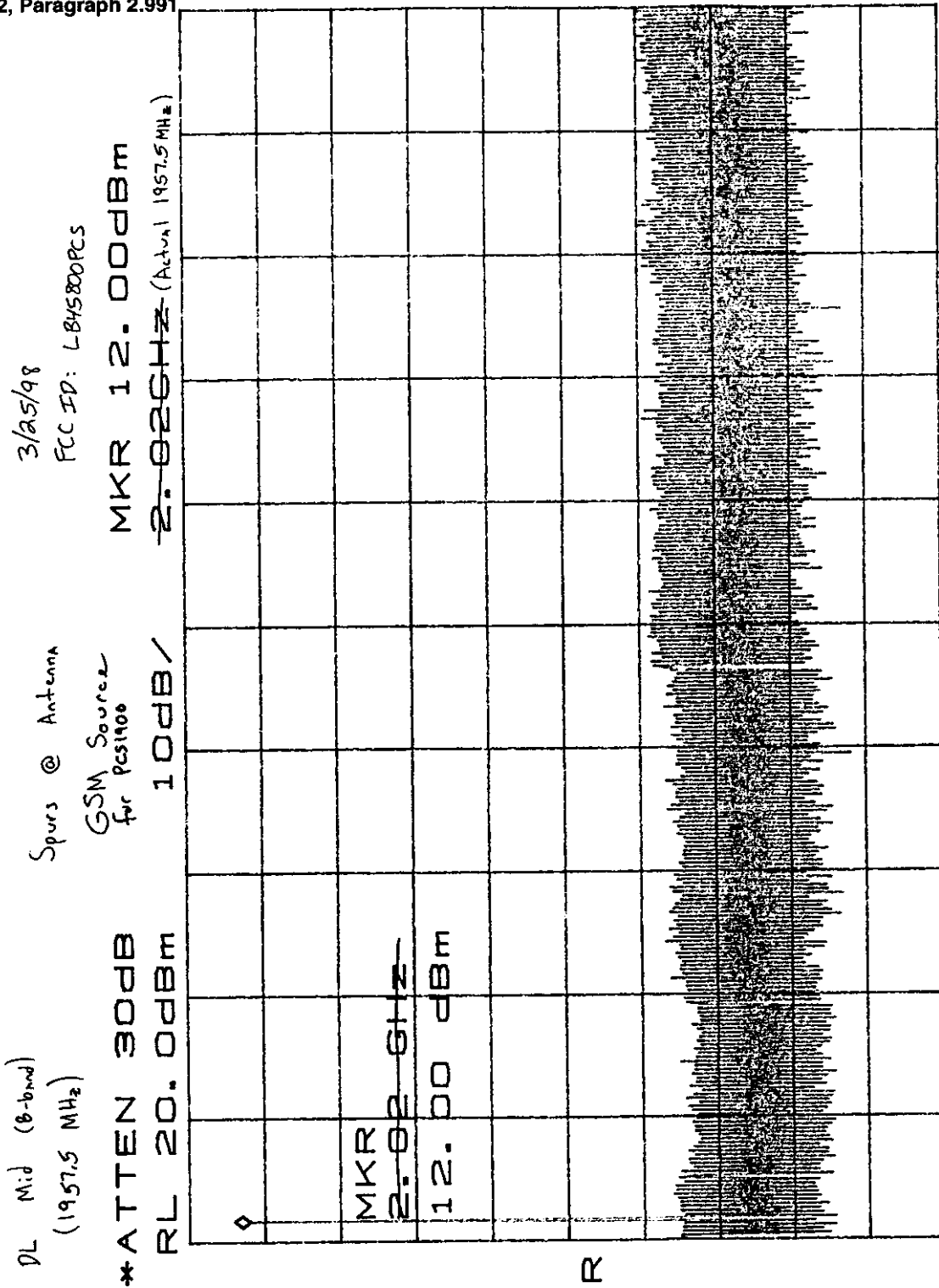


2.991

Tested by ORTEL CORPORATION.

START 1.60GHZ *RBW 1.0MHZ *VBW 1.0MHZ STOP 26.50GHZ SWP 500ms

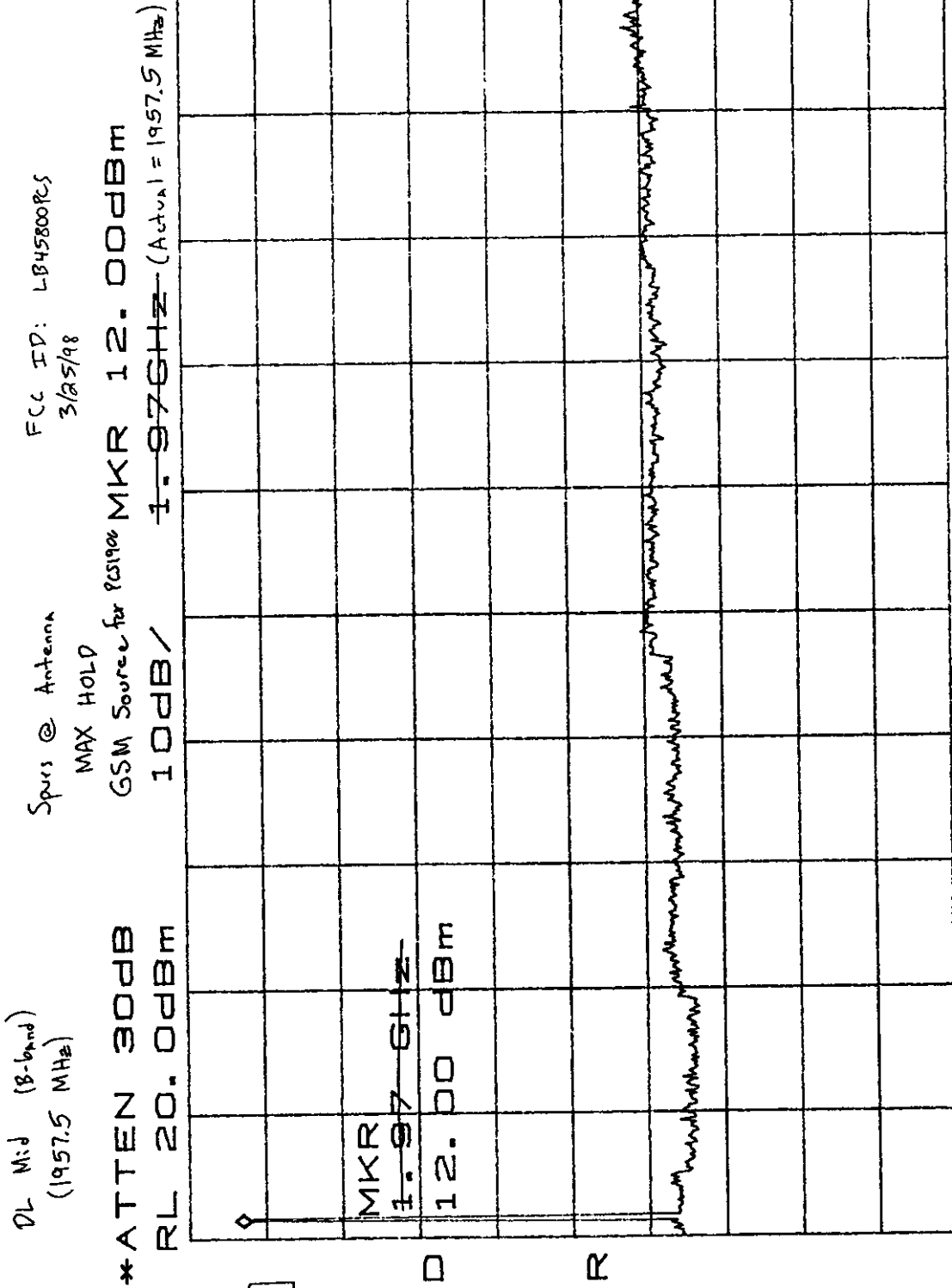
Part 2, Paragraph 2.991



START 1.60GHz STOP 26.50GHz
*RBW 1.0MHz *VBW 1.0MHz SWP 500ms

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.991



2.991

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.991

DL High (B-band)
(1964.8 MHz)

FCC ID: LB45800PCS
3/25/98

Spurs @ Antenna

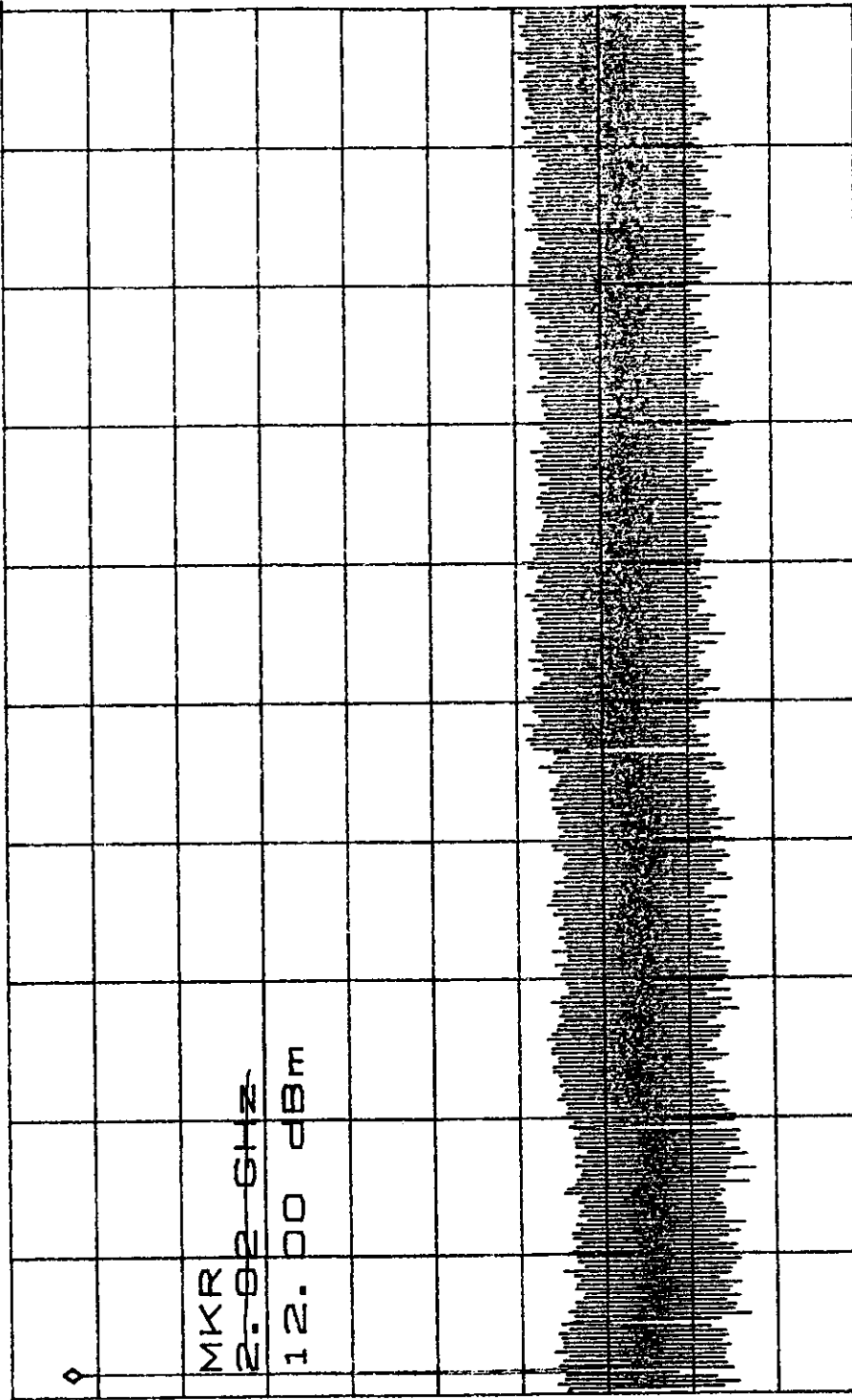
GSM Source
for PCS 1900
10dB/

MKR 12.00dBm

~~2.02 GHz~~ (Actual 1964.8 MHz)

* ATTN 30dB

RL 20.0dBm



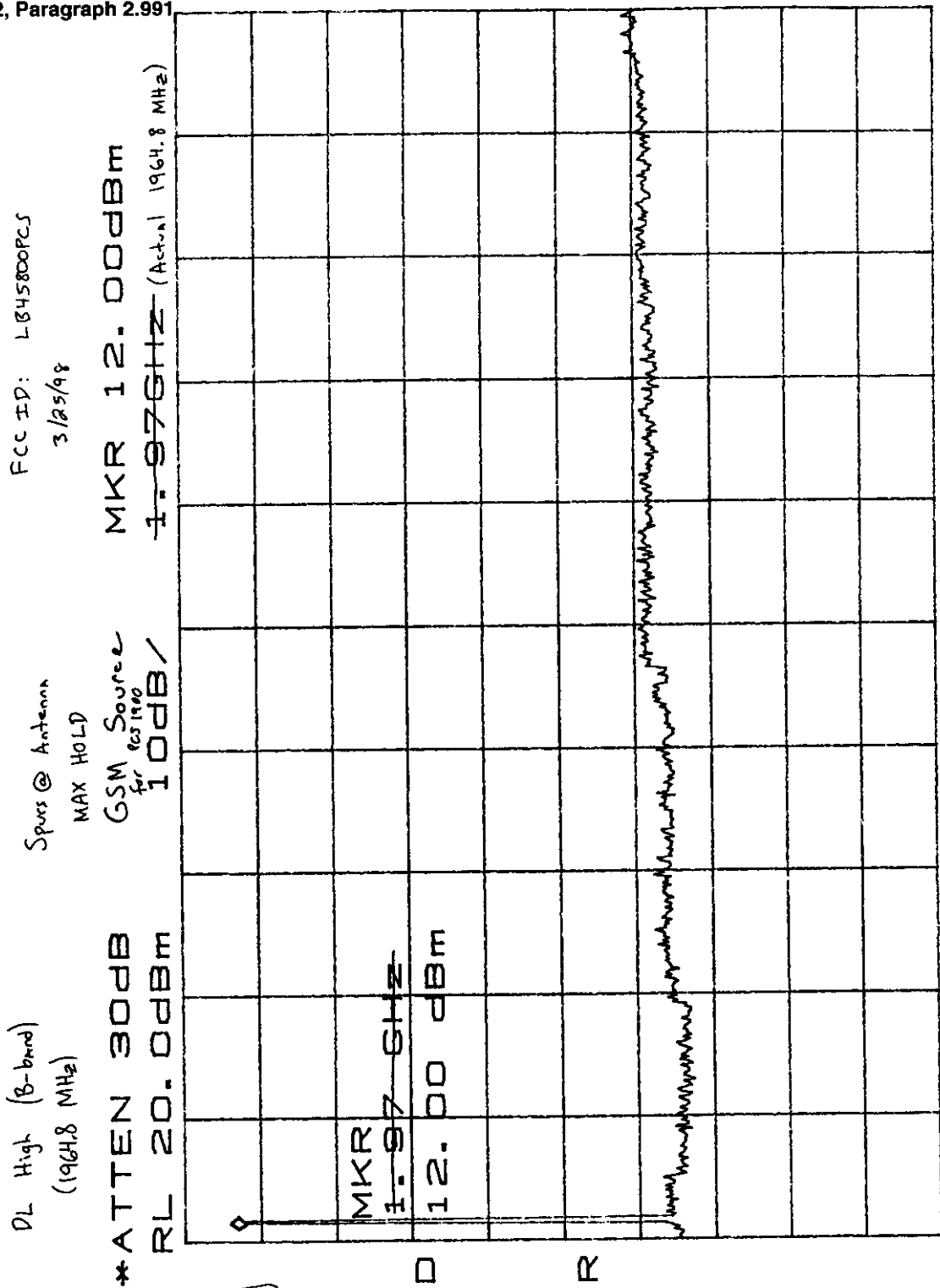
START 1.60GHZ STOP 26.50GHZ

*RBW 1.0MHZ *VBW 1.0MHZ SWP 500ms

2.991

Tested by ORTEL CORPORATION.

Part 2, Paragraph 2.991

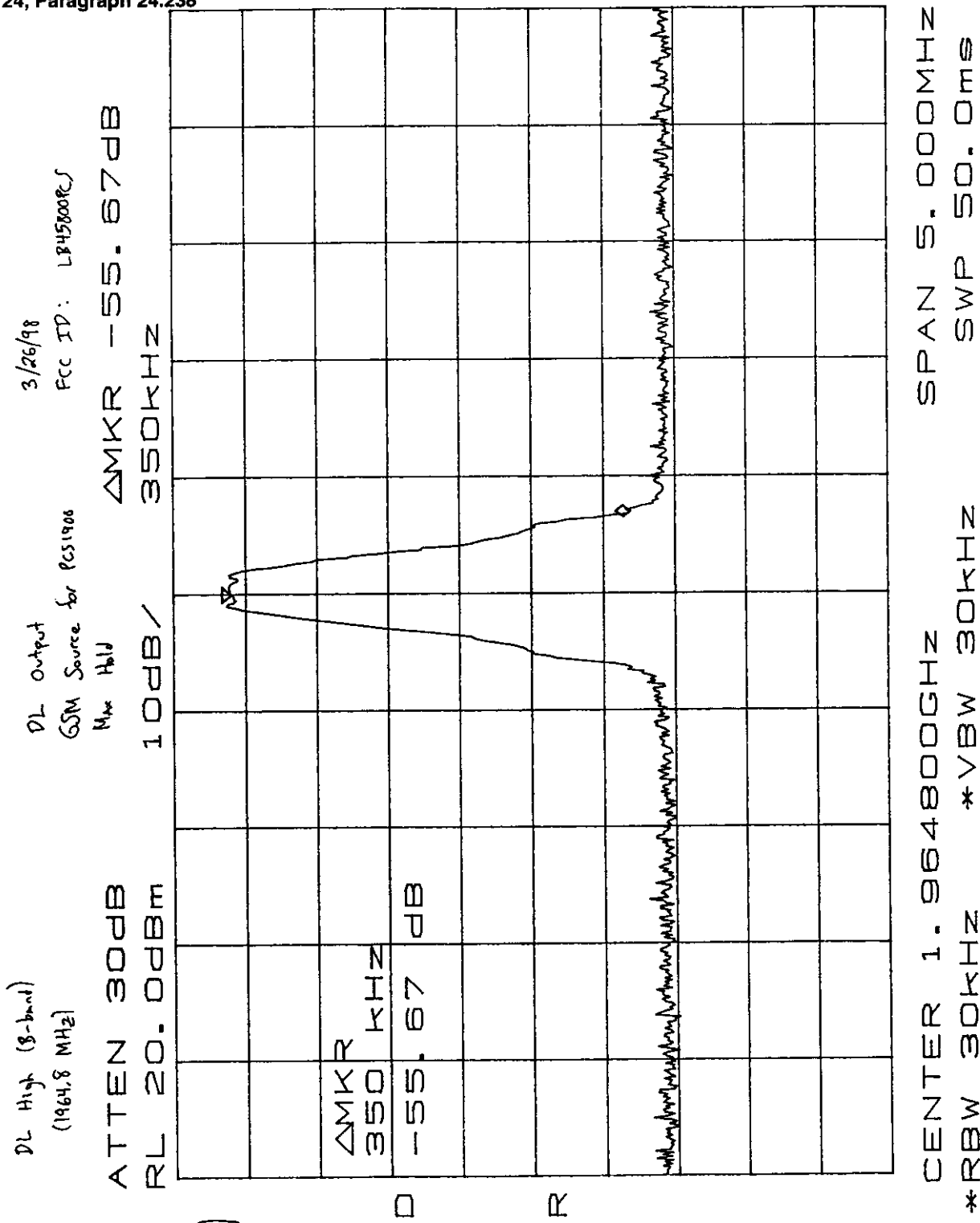


START 1.600GHZ *RBW 1.0MHZ *VBW 1.0MHZ SWP 500ms

STOP 26.500GHZ

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238

3/26/98
 FCC ID: LB45800PCS
 Input Source Splits 1:8

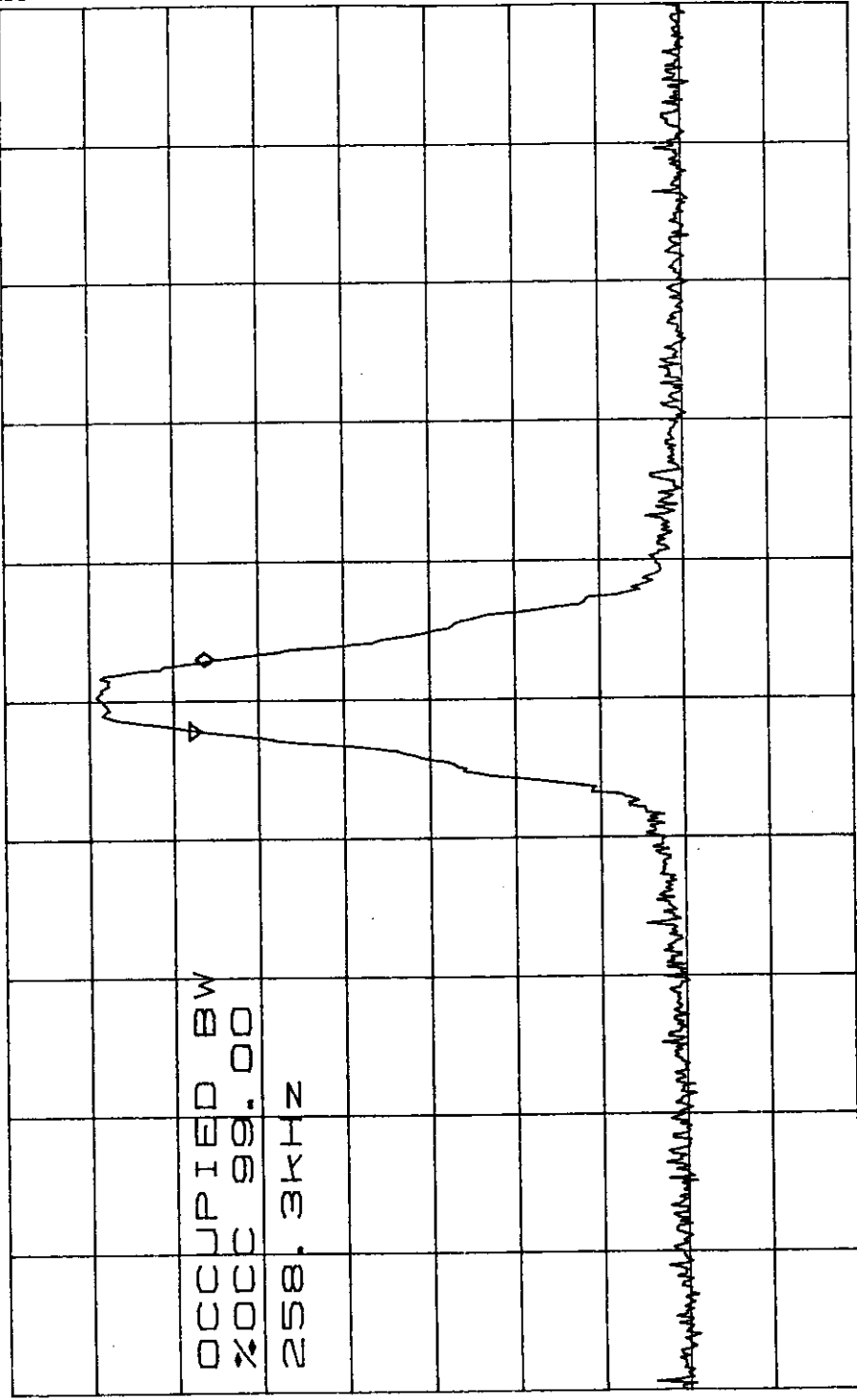
Input Signal Fr
 GSM Source for PCS1900
 Max Hold

PL High (B-band)
 (1964.8 MHz)

MKR 8.50dBm
 1.964800GHZ

ATTEN 30dB
 RL 20.0dBm

10dB/

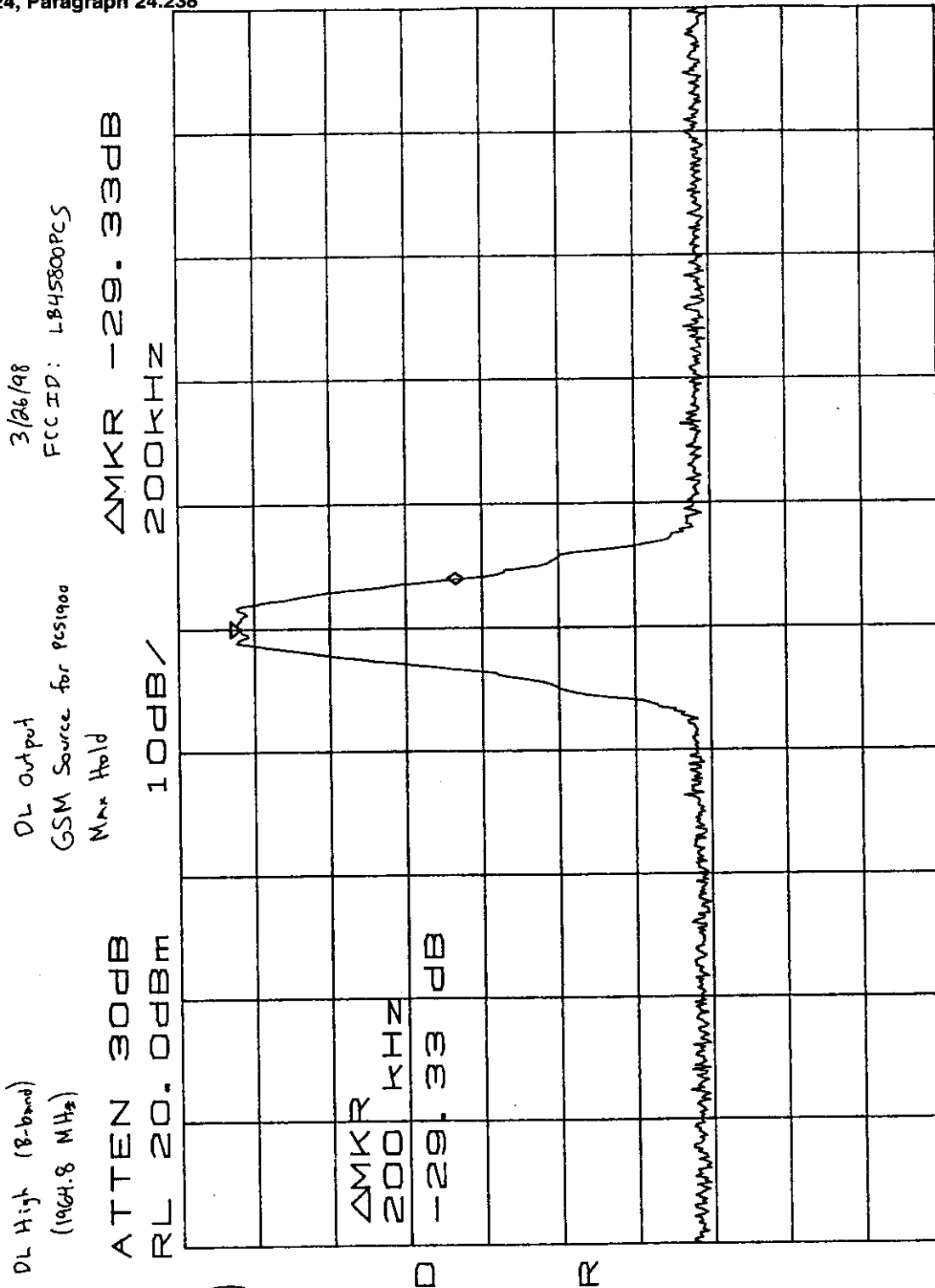


CENTER 1.964800GHZ SPAN 5.000MHZ
 *RBW 30KHZ *VBW 30KHZ SWP 50.0ms

24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



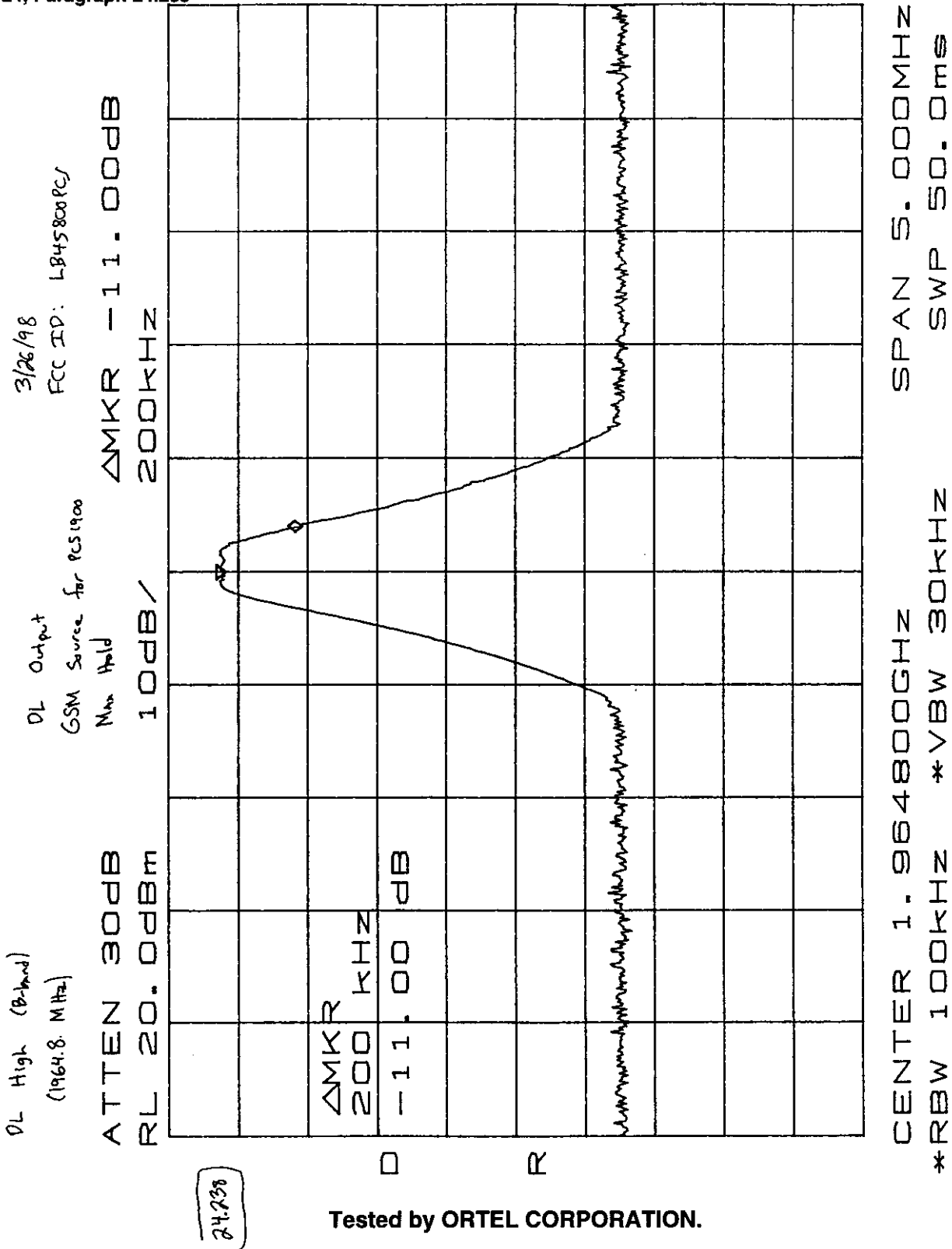
CENTER 1.964800GHZ
*RBW 30KHZ *VBW 30KHZ

SPAN 5.000MHZ
SWP 50.0ms

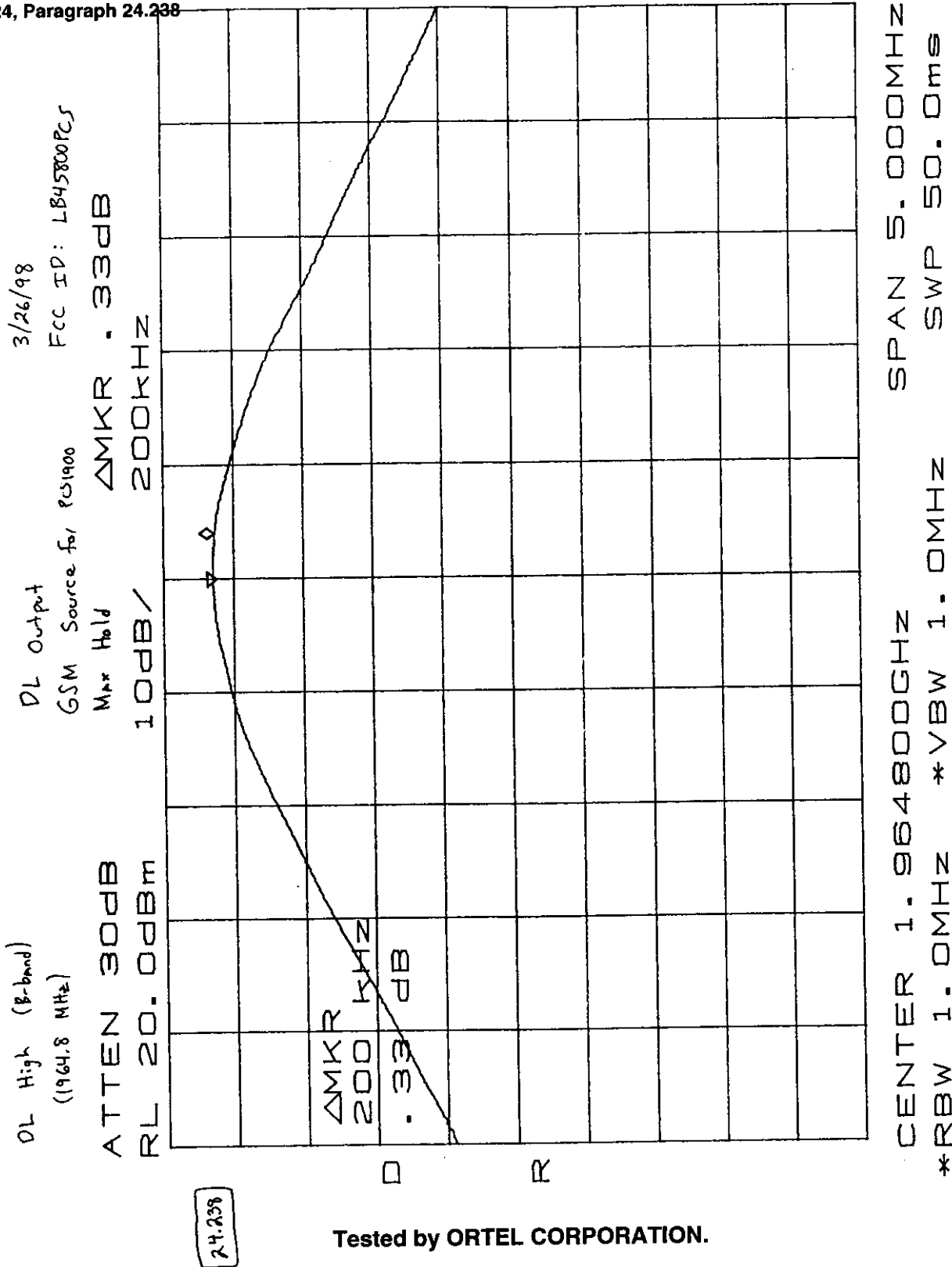
24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238

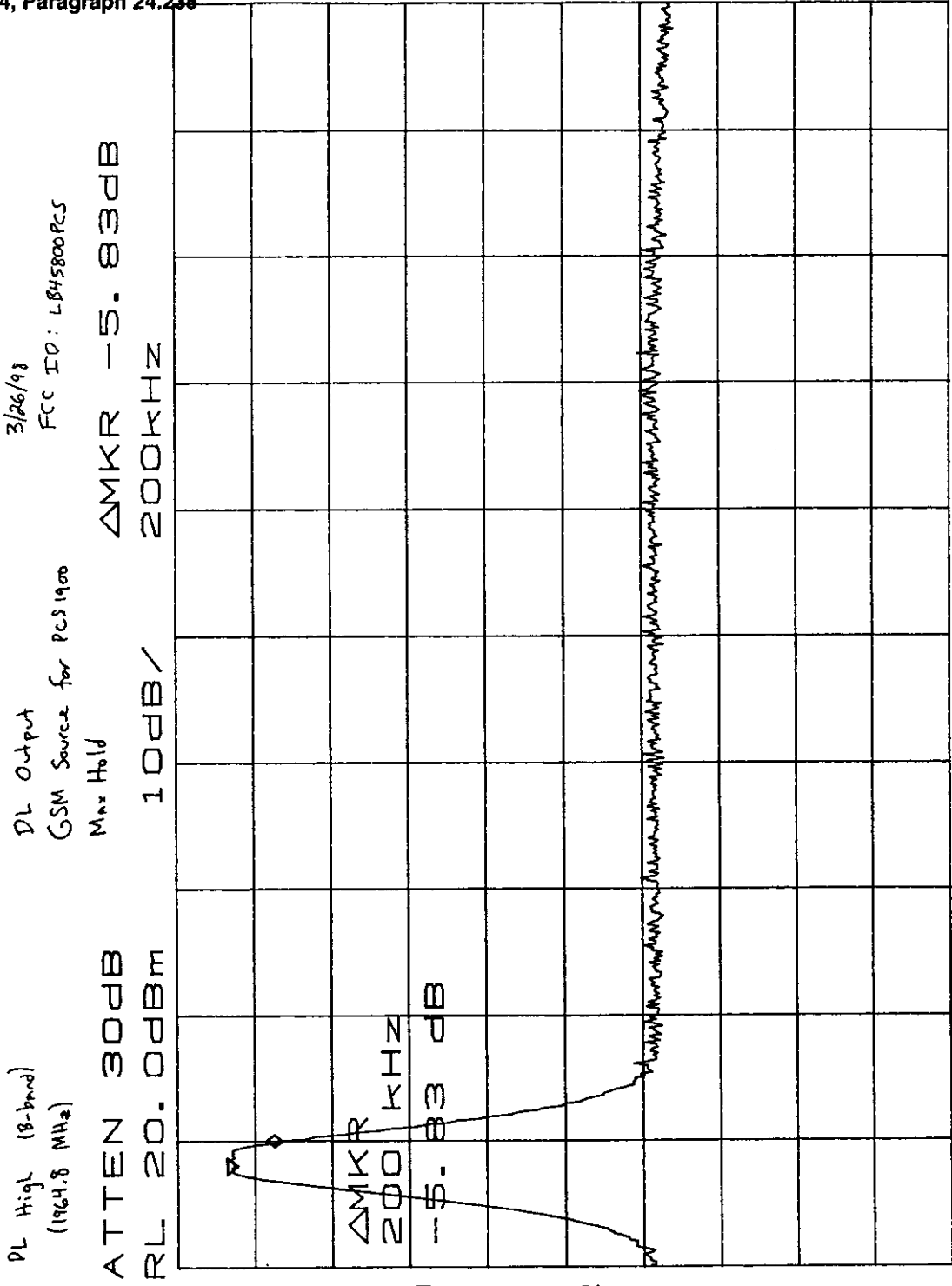


Part 24, Paragraph 24.238



Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238

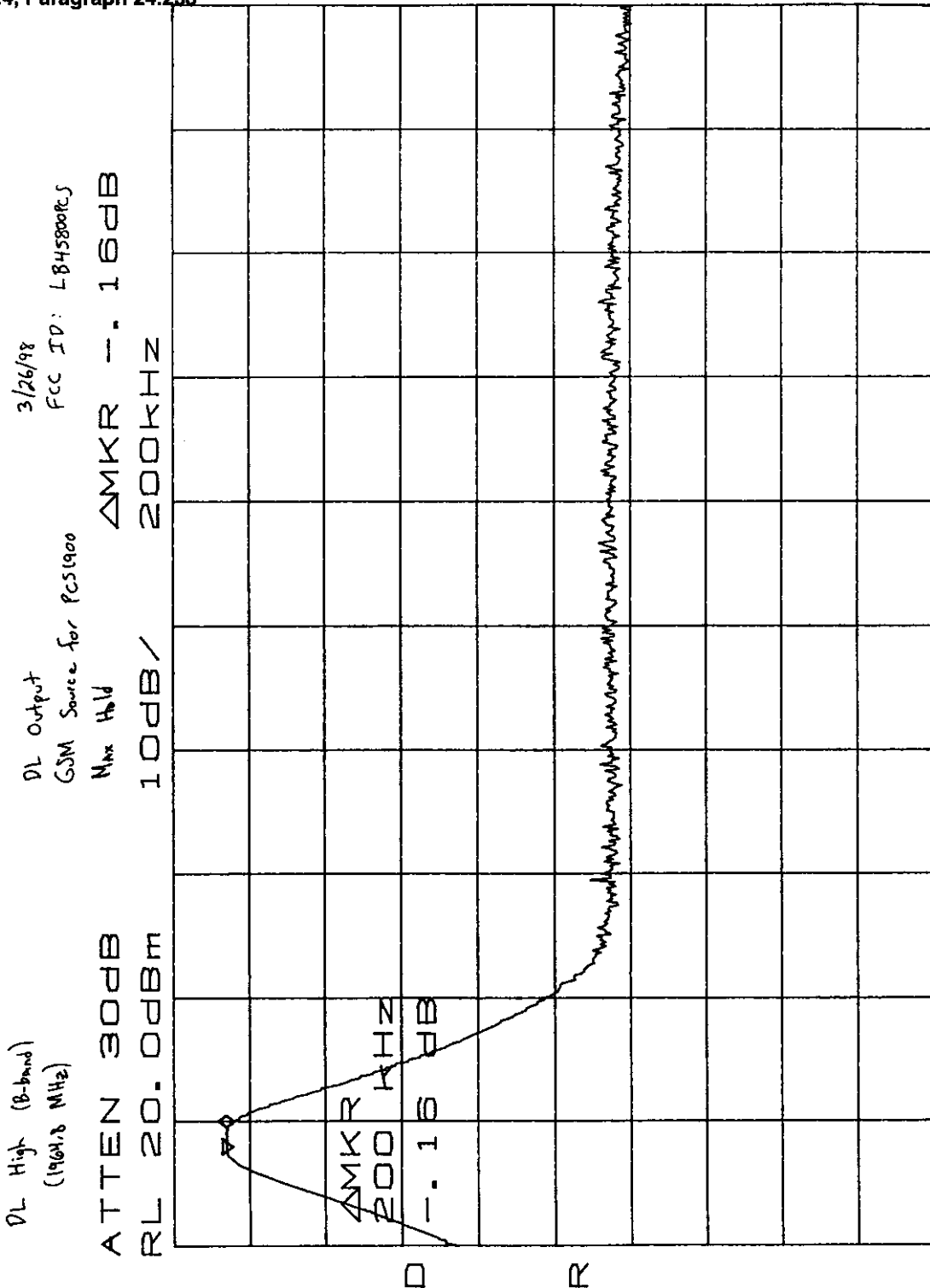


CENTER 1.96900GHZ *VBW 1.0MHZ
 *RBW 100KHZ SWP 50.0ms

34.238

Tested by ORTEL CORPORATION.

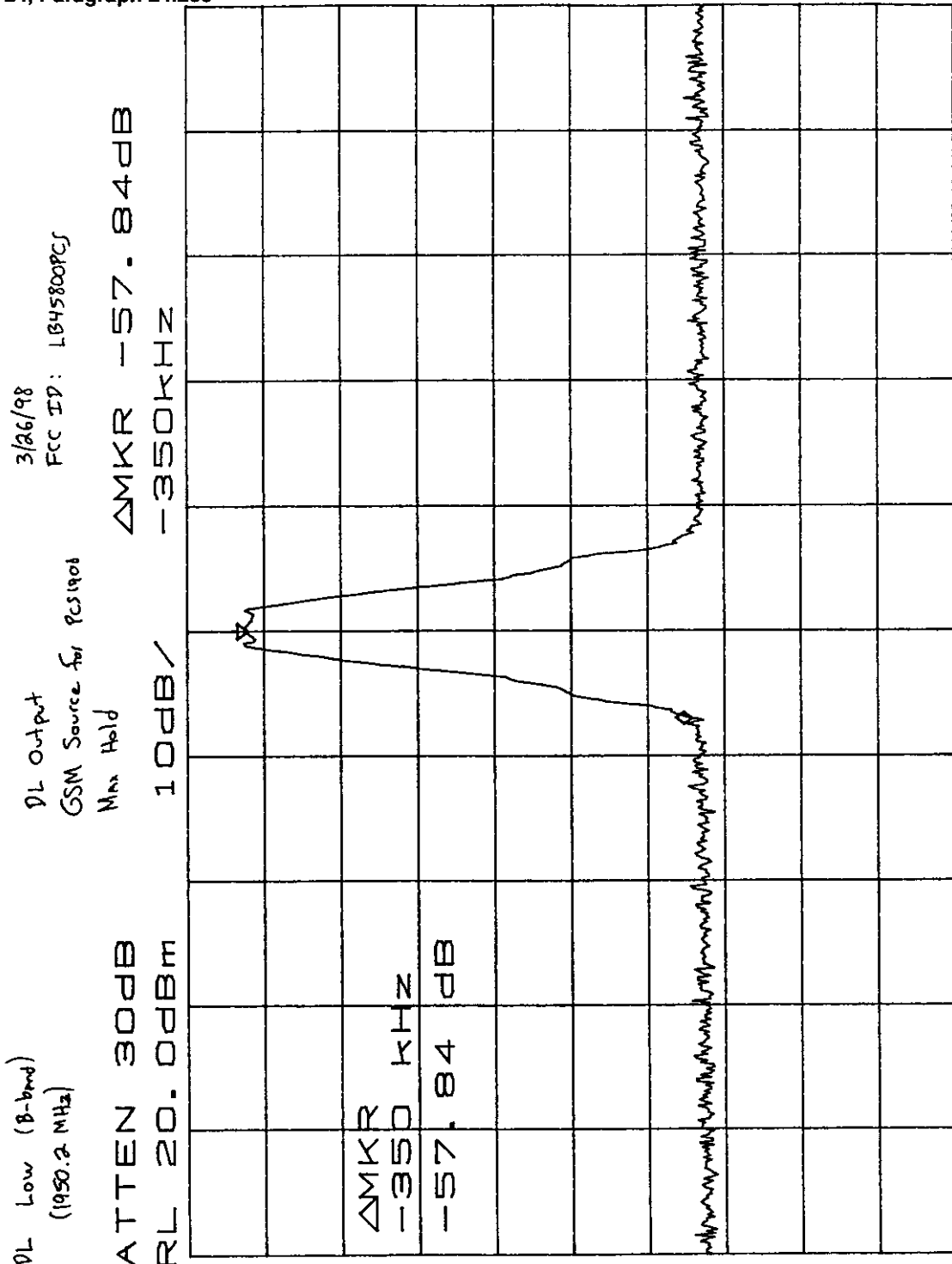
Part 24, Paragraph 24.238



24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



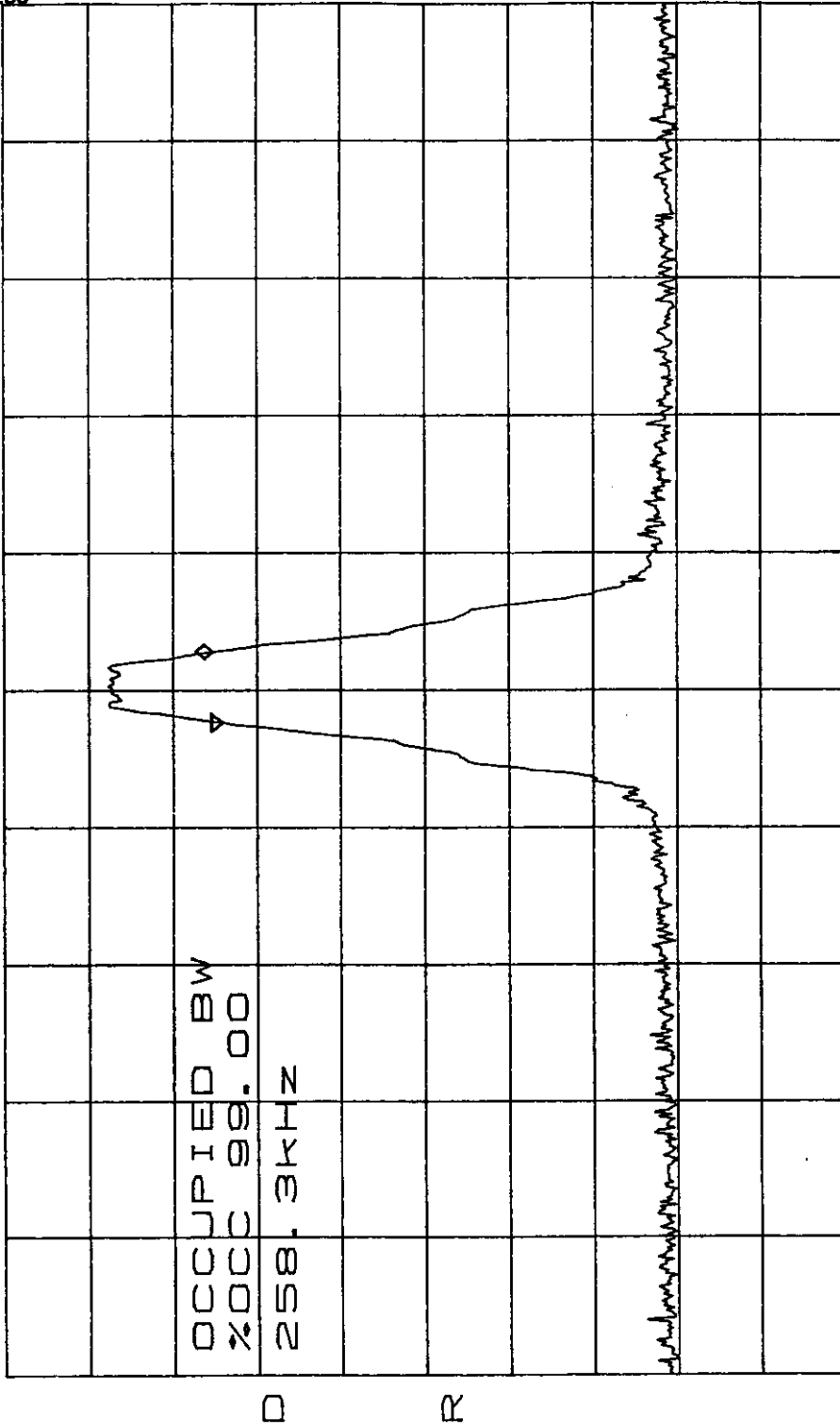
CENTER 1.950200GHZ
*RBW 30KHZ *VBW 30KHZ

SPAN 5.000MHZ
SWP 50.0ms

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238

DL Low (B-band)
(1950.2MHz)
ATTEEN 30dB
RL 20.0dBm
Input Signal In
GSM Source for PCS1900
Max Hold
3/26/98
FCC ID: LB45800PCS
Input Source Splitr 1:8
 Δ MKR 1.16dB
258kHz
10dB/

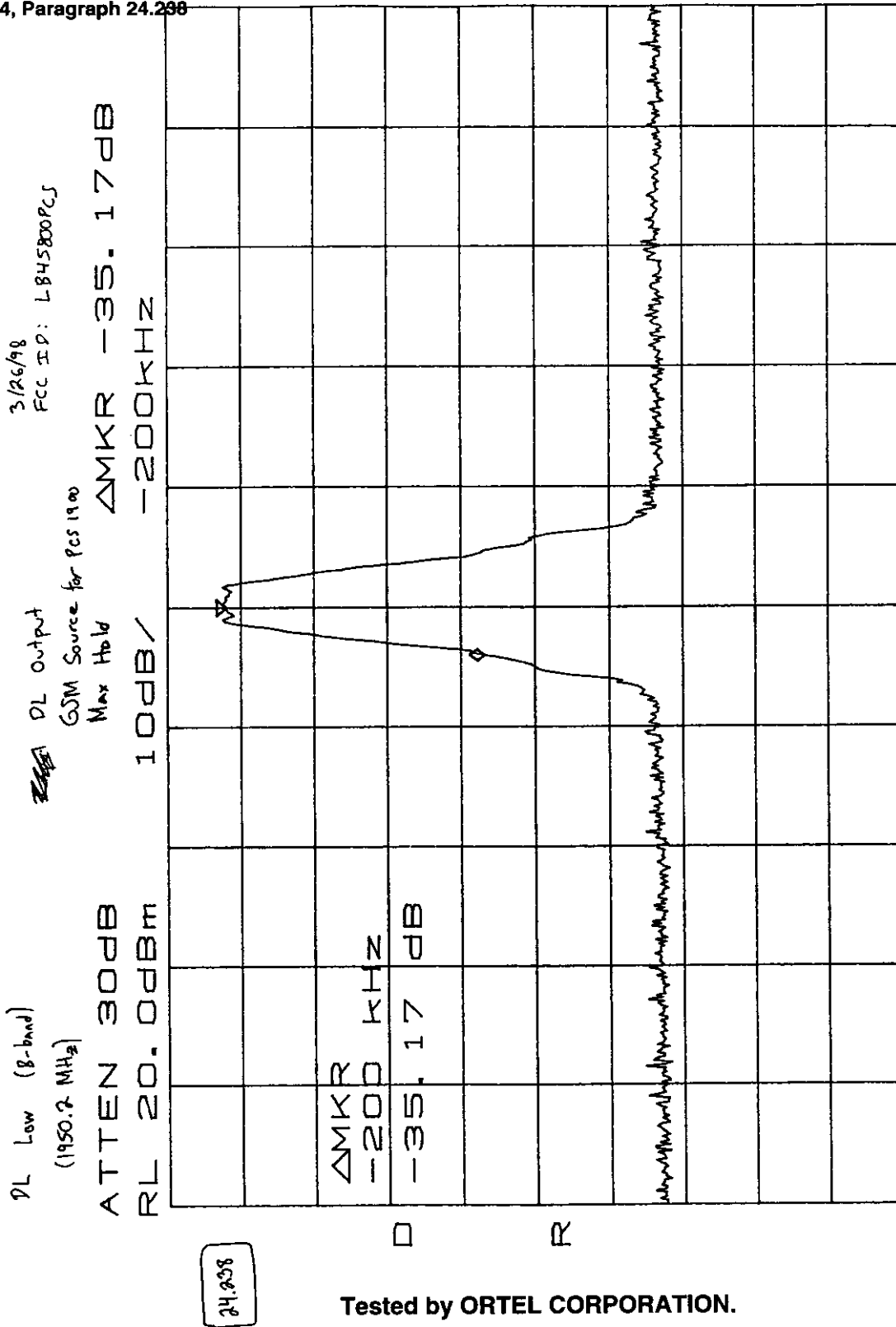


CENTER 1.950200GHZ
*RBW 30kHz *VBW 30kHz
SPAN 5.000MHZ
SWP 50.0ms

24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



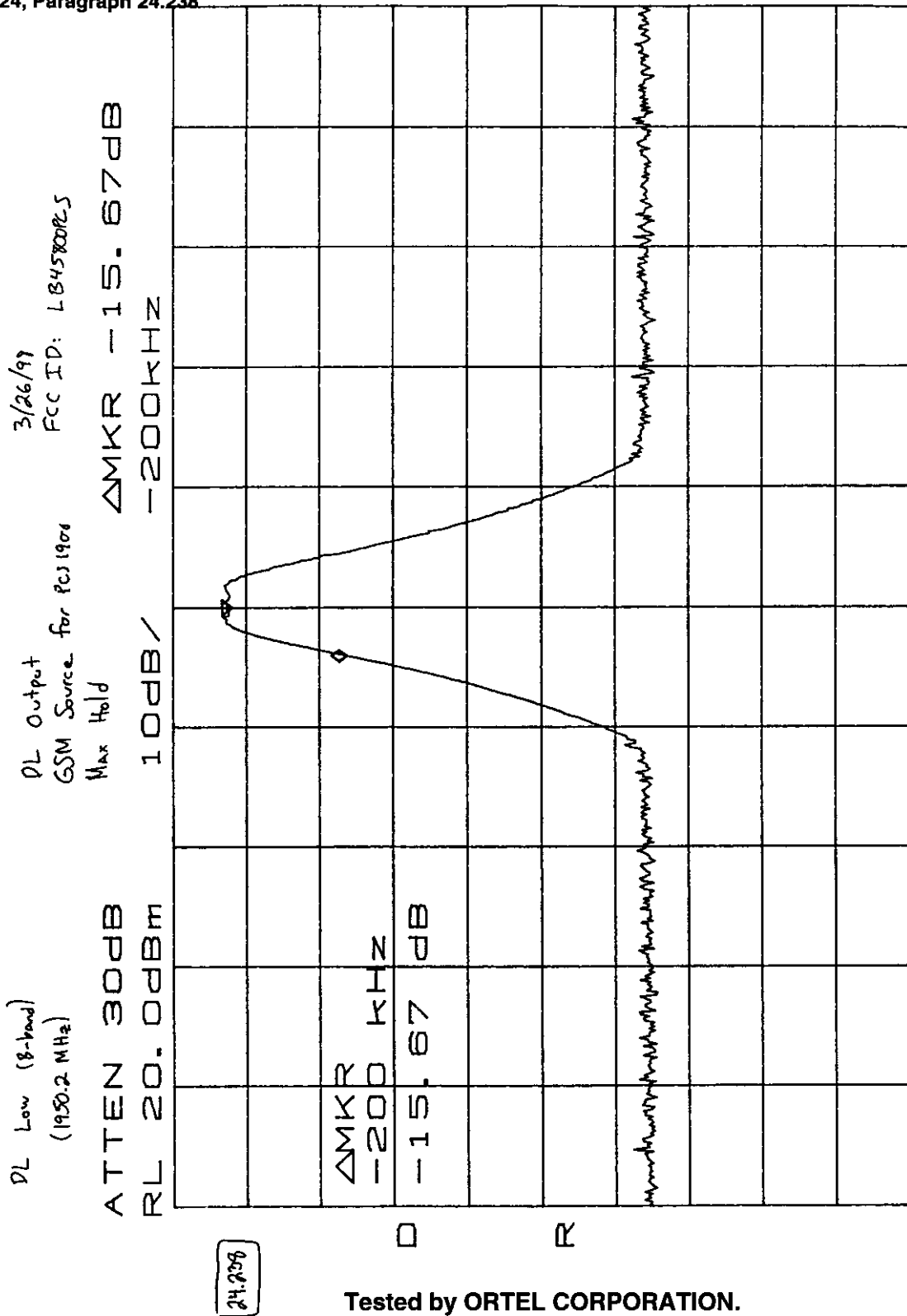
CENTER 1.950200GHZ
*RBW 30KHZ

SPAN 5.000MHZ
SWP 50.0ms

*VBW 30KHZ

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



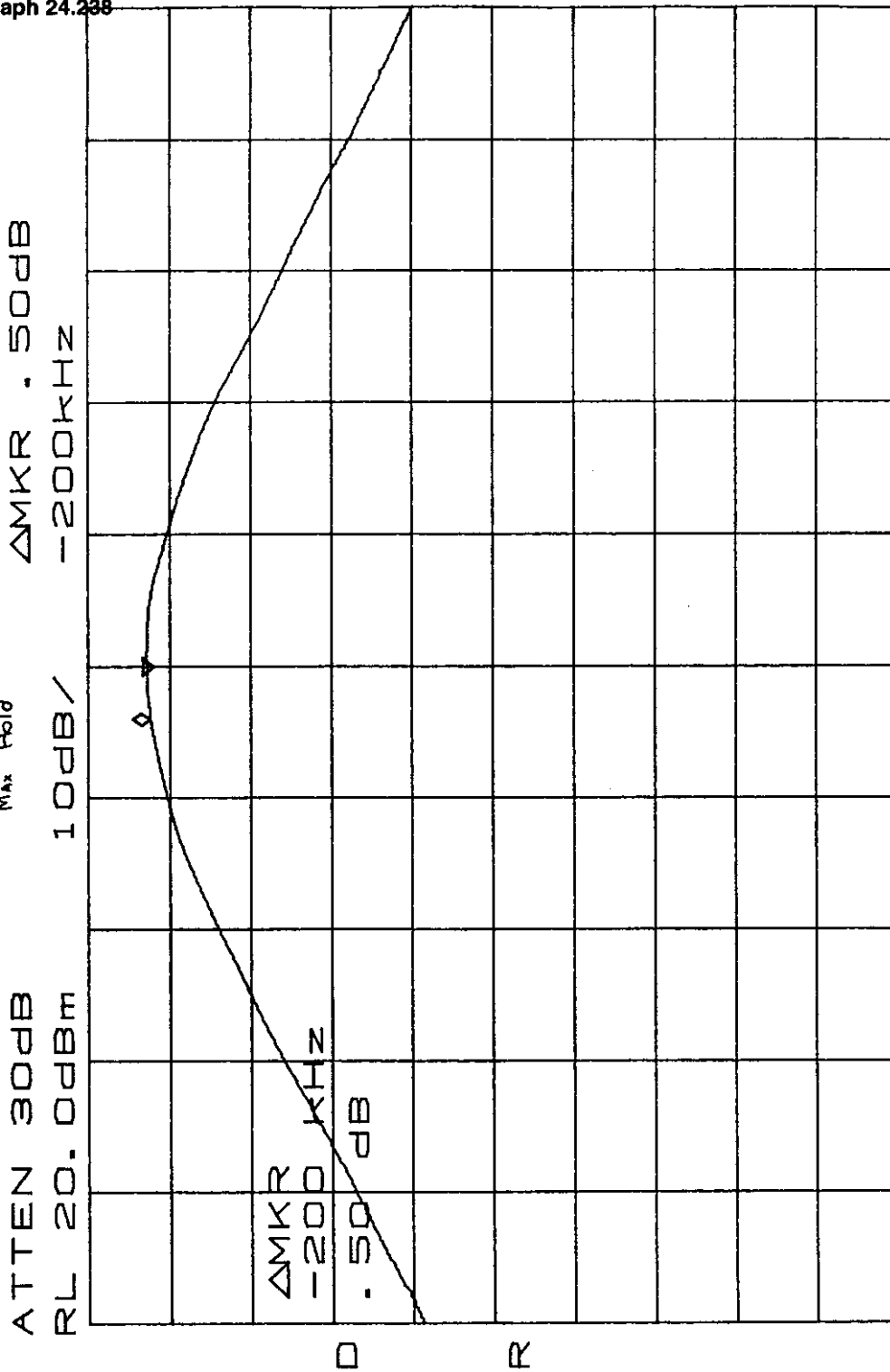
CENTER 1.950200GHZ
 *RBW 100KHZ *VBW 30KHZ
 SPAN 5.000MHZ
 SWP 50.0ms

Part 24, Paragraph 24.238

3/26/98
FCC ID: LB45800PCS

DL Output
GSM Source for PCS1904
Max Hold

DL Low (8-band)
(1950.2 MHz)



CENTER 1.950200GHZ SPAN 5.000MHZ
*RBW 1.0MHZ *VBW 1.0MHZ SWP 50.0ms

24.238

Tested by ORTEL CORPORATION.

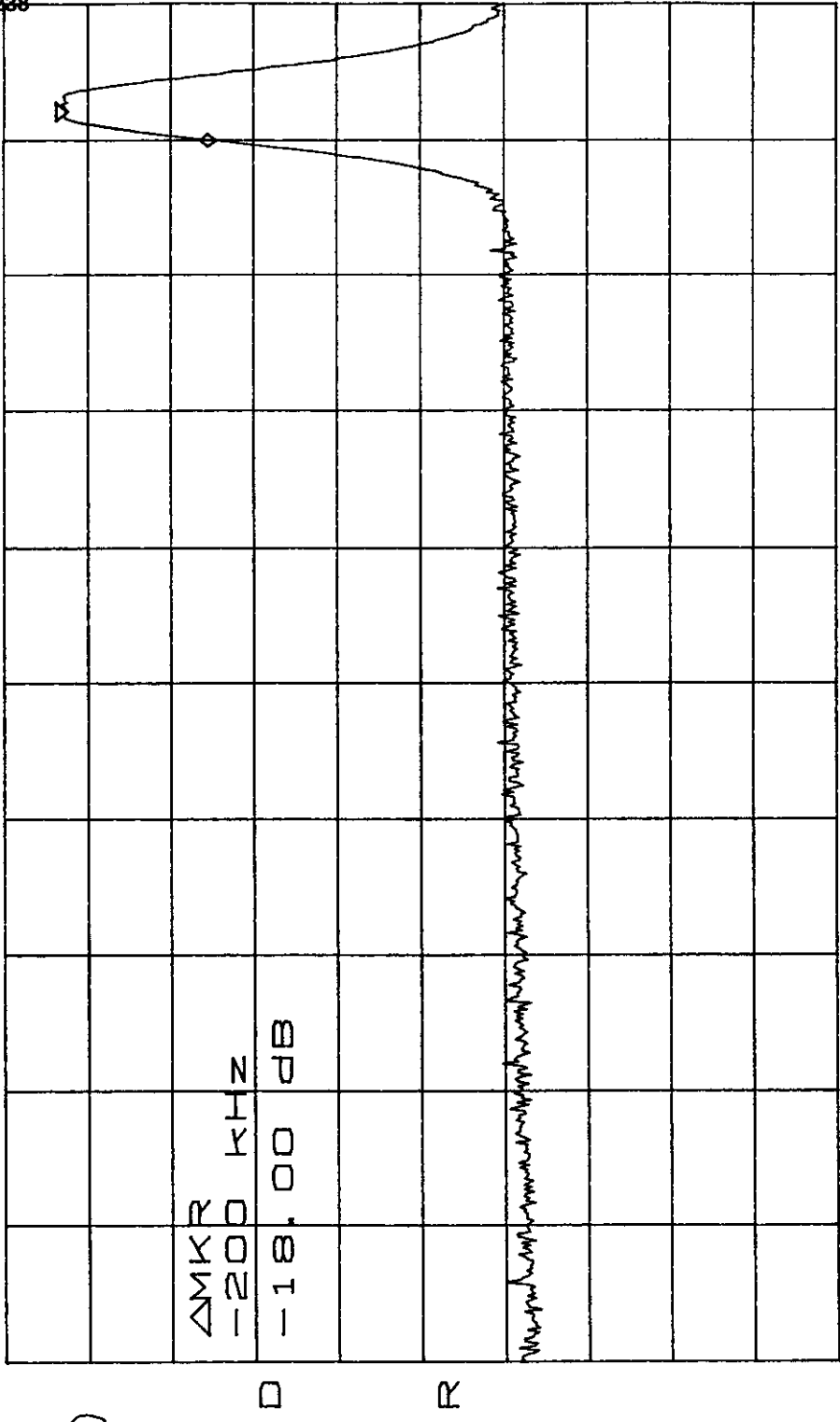
Part 24, Paragraph 24.238

3/26/98
FCC ID: L B45800PCS

DL output
GSM Source for PCS1900
Max Hold

DL Low (8-band)
(1950.2 MHz)

ATTEN 30dB
RL 20.0dBm
ΔMKR -18.00dB
-200KHZ



CENTER 1.94600GHZ
*RBW 100KHZ *VBW 1.0MHZ
SPAN 10.00MHZ
SWP 50.0ms

24.238

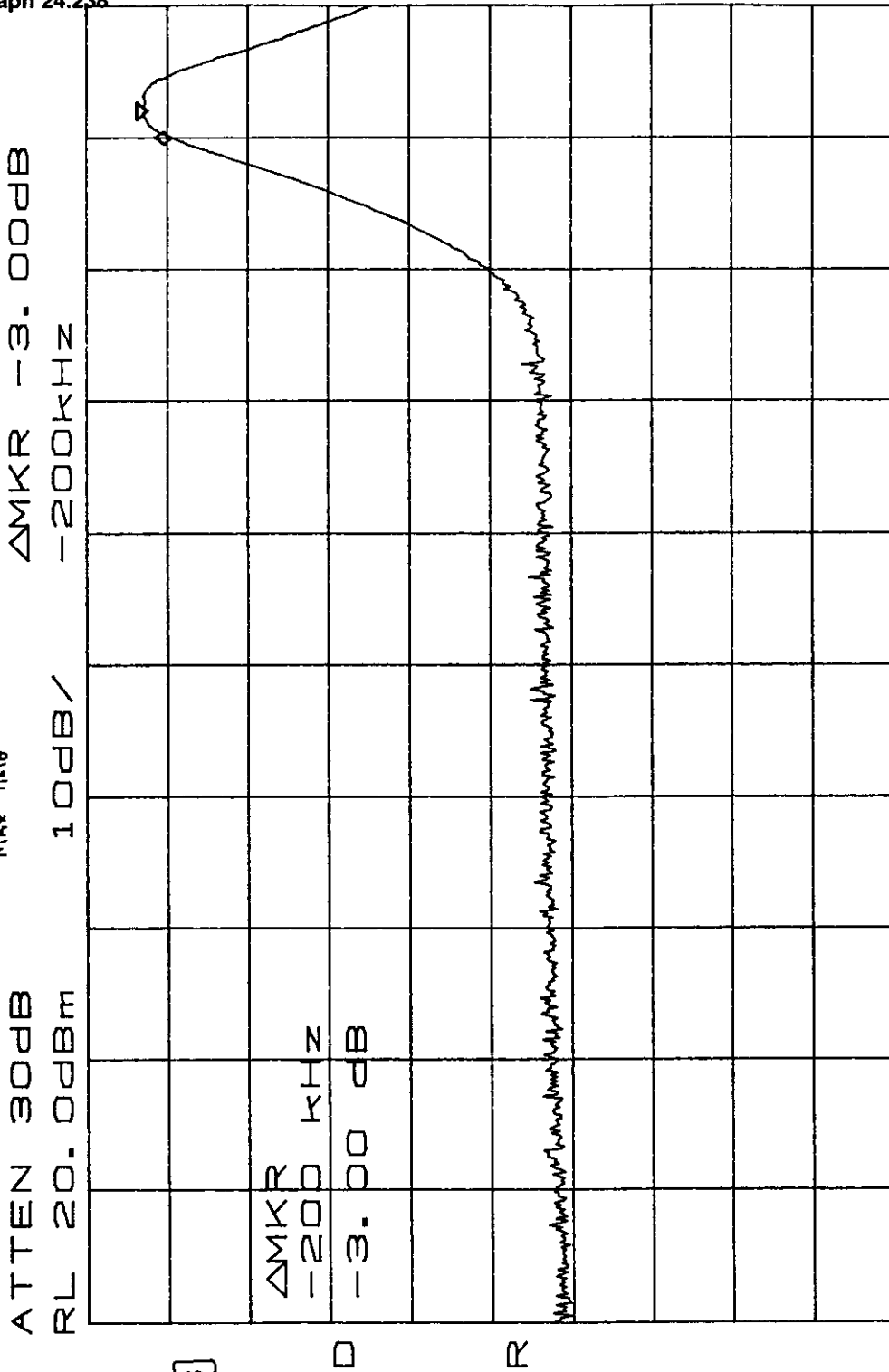
Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238

3/26/98
FCC ID: LB45800PCS

DL Output
GSM Source for PCS 1900
Max Hold

DL Low (8-band)
(190.2 MHz)



Tested by ORTEL CORPORATION.

2-tone

4/6/98
FCC ID: LB45800PCS

Intermods Over
B-band

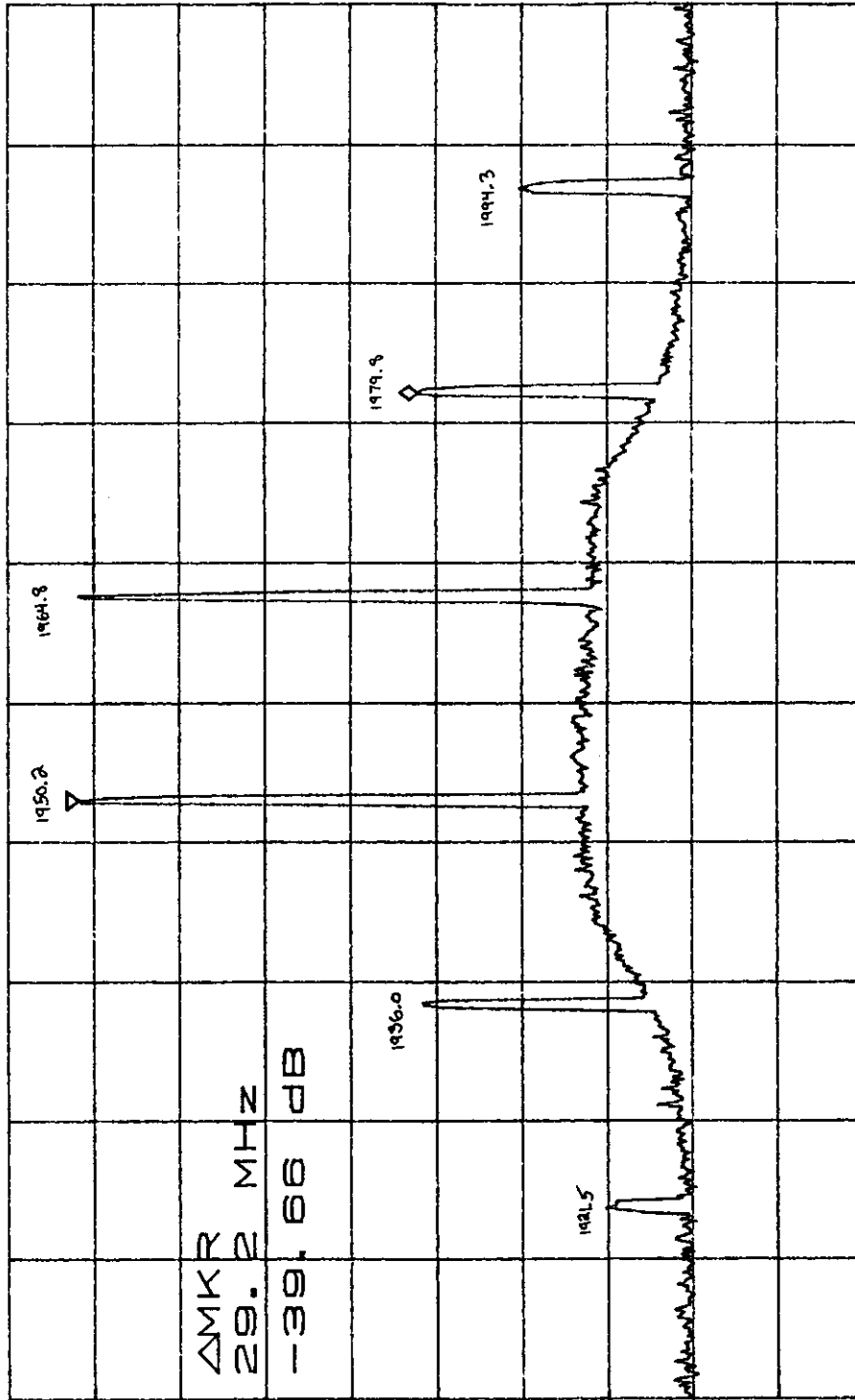
MAX HOLD

DL Input Freqs: 1950.2 MHz
1964.8 MHz
(GSM Sources
for PCS 1900)

ATTEN 30dB
RL 20.0dBm

ΔMKR -39.66dB
29.2MHz

10dB/



CENTER 1.9575GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 100.0MHZ
SWP 280ms

2-tone

Tested by ORTEL CORPORATION.

2-tone

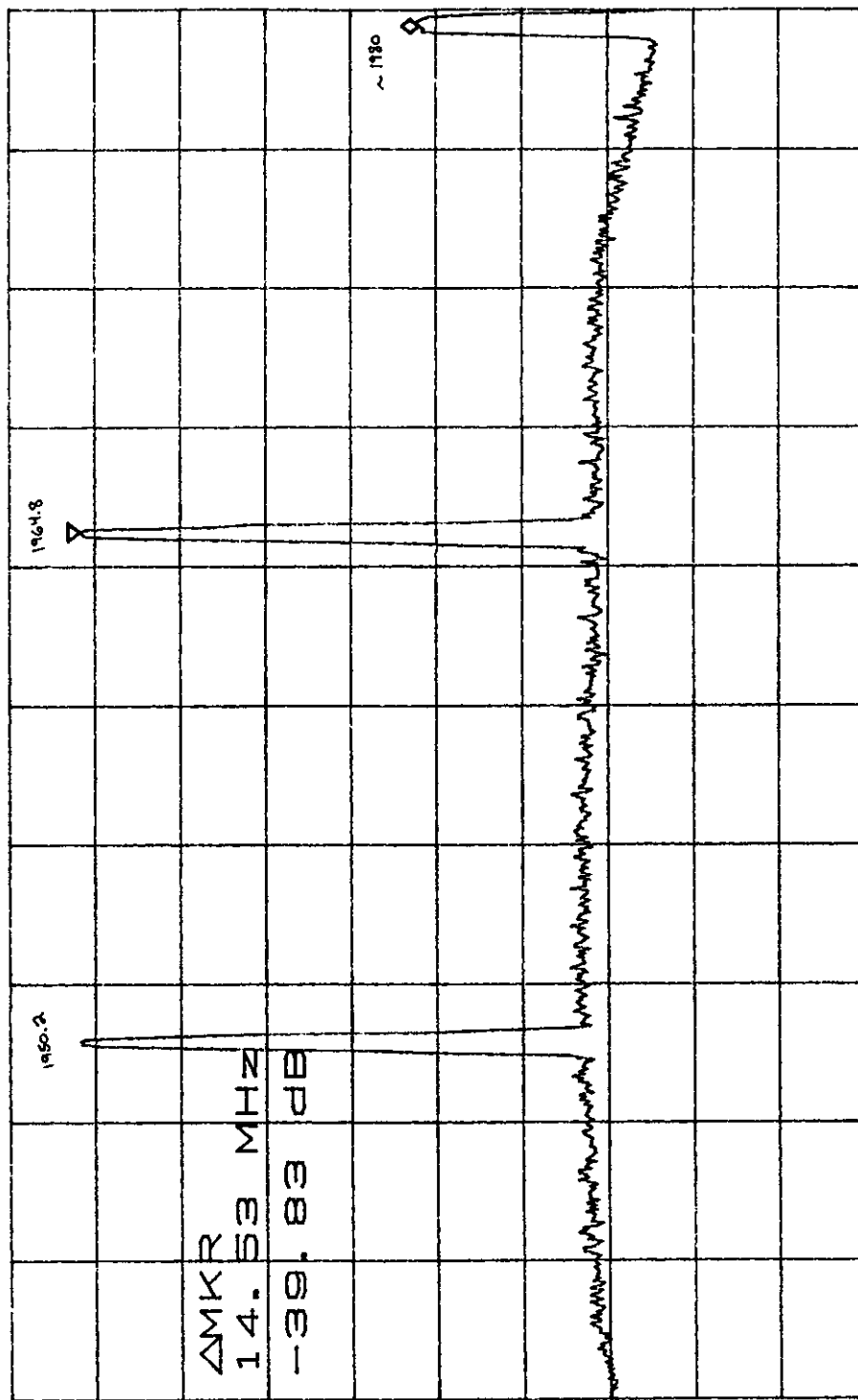
4/6/98
FCC ID: LB45800PCS

Intermods Over
B-band

MAX HOLD

DL Inputs Freq: 1950.2 MHz
1964.8 MHz
(GSM Sources for PCS 1900)

ATTEN 30dB
RL 20.0dBm
ΔMKR -39.83dB
14.53MHz



2-tone

Tested by ORTEL CORPORATION.

START 1.94000GHZ STOP 1.98000GHZ
*RBW 30KHZ *VBW 30KHZ SWP 120ms

2-tone

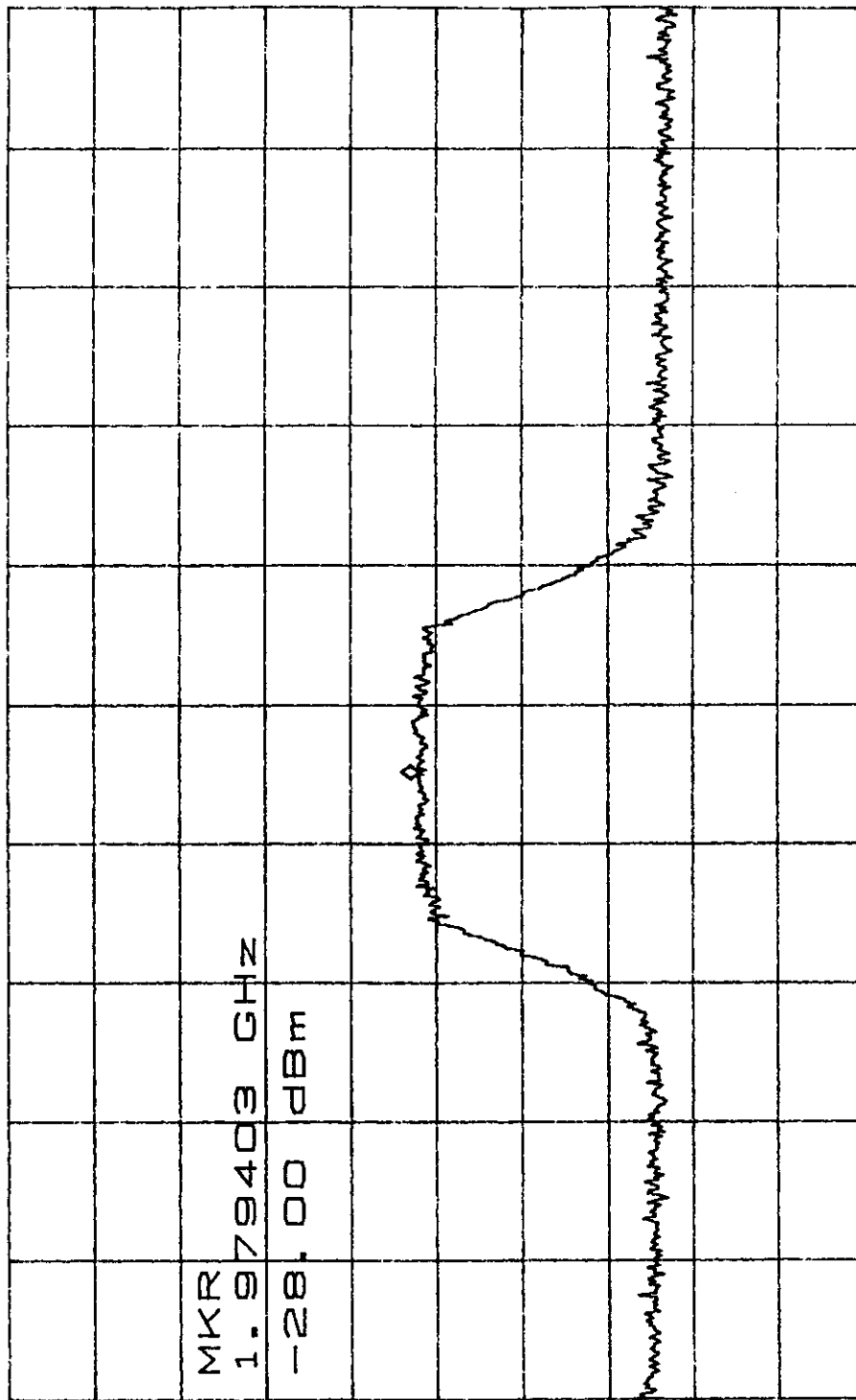
4/6/98
FCC ID: LB45800PCS

Highest Peak Intermod
B-band
MAX HOLD

DL Impl Freq's: 1950.2 MHz
1964.8 MHz
(GSM Sources)
for PCS 1900

MKR -28.00dBm
1.979403GHZ

ATTEN 30dB
RL 20.00dBm



2-tone

Tested by ORTEL CORPORATION.

CENTER 1.979500GHZ
*RBW 30KHZ *VBW 30KHZ SPAN 2.000MHZ SWP 50.0ms

2-tone

4/6/98
FCC ID: LB45800PCS
Inputs to 1:4 Splitter on Hub (Slight amplitude difference of peaks due to gain variation over BW)

Inputs for IMD
B-band
MAX HOLD

DL Inputs: 1950.8 MHz
1964.8 MHz

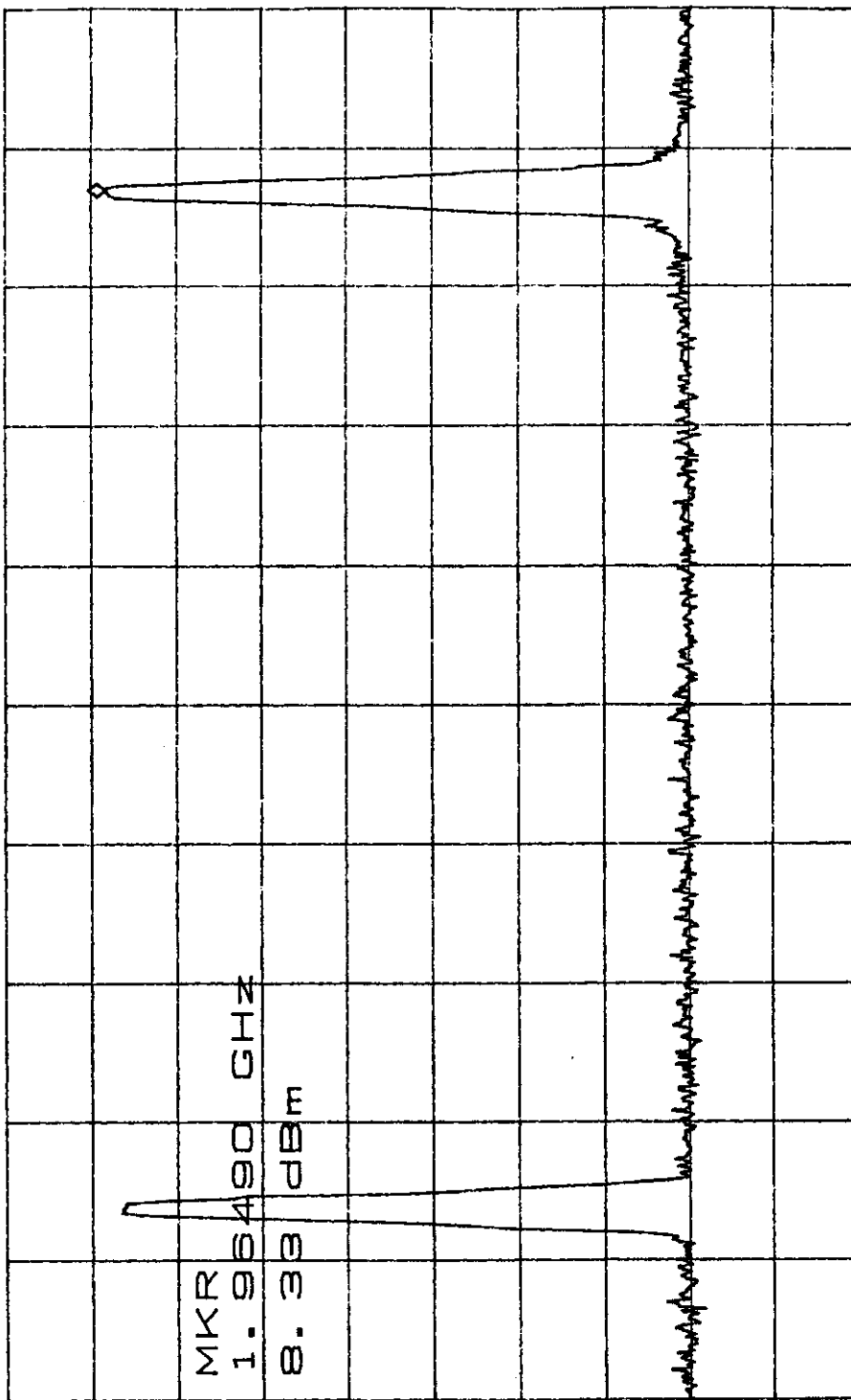
(GSM Sources for PISIMD)

AT TEN 30dB
MKR 8.33dBm

RL 20.0dBm

10dB/

1.96490GHZ



2-tone

Tested by ORTEL CORPORATION.

CENTER 1.95750GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 20.00MHZ
SWP 56.0ms

2-tone

4/6/98
FCC ID: LB45800PCS

Intermods Over B-band

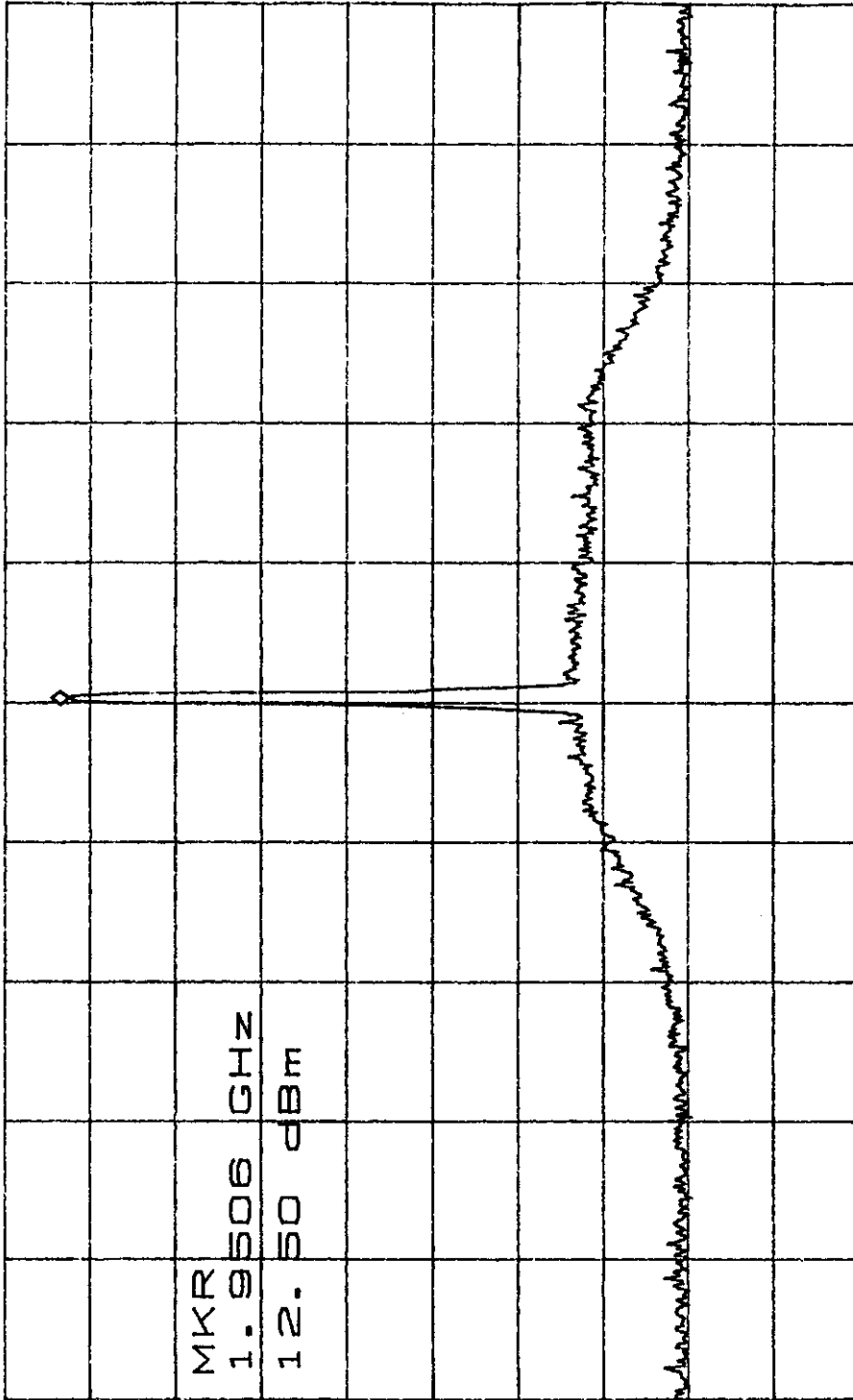
MAX HOLD

DL Input Freq's: 1950.2 MHz
1950.4 MHz

(GSM Source)
for FCC 1906

ATTEN 30dB
RL 20.0dBm

MKR 12.50dBm
1.9506GHZ



2-tone

Tested by ORTEL CORPORATION.

CENTER 1.9503GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 100.0MHZ SWP 280ms

2-tone

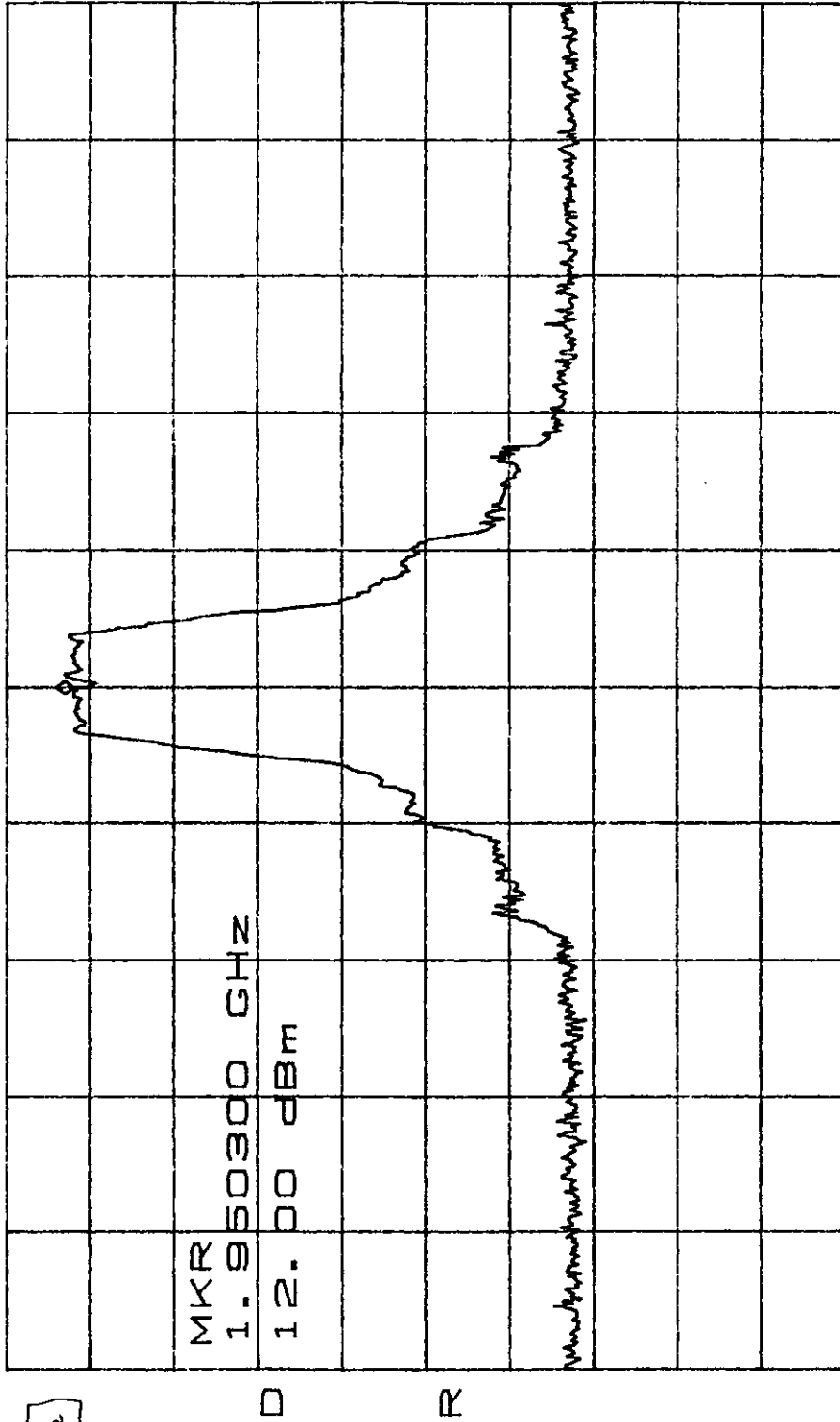
4/6/98
FCC ID: LB45800PCS

Intermod Over B-band
MAX HOLD

DL Input Freq's: 1950.2 MHz
1950.4 MHz
(GSM Sources)
for P21909

MKR 12.00dBm
1.950300GHZ

ATTEN 30dB
RL 20.00dBm



2-tone

Tested by ORTEL CORPORATION.

CENTER 1.950300GHZ
*RBW 30KHZ *VBW 30KHZ
SPAN 5.000MHZ
SWP 50.0ms

2-tone

4/6/98
FCC ID: LB45800PCS
Inputs to 1:4 Splitter

Inputs for IMP
B-band

MAX HOLD

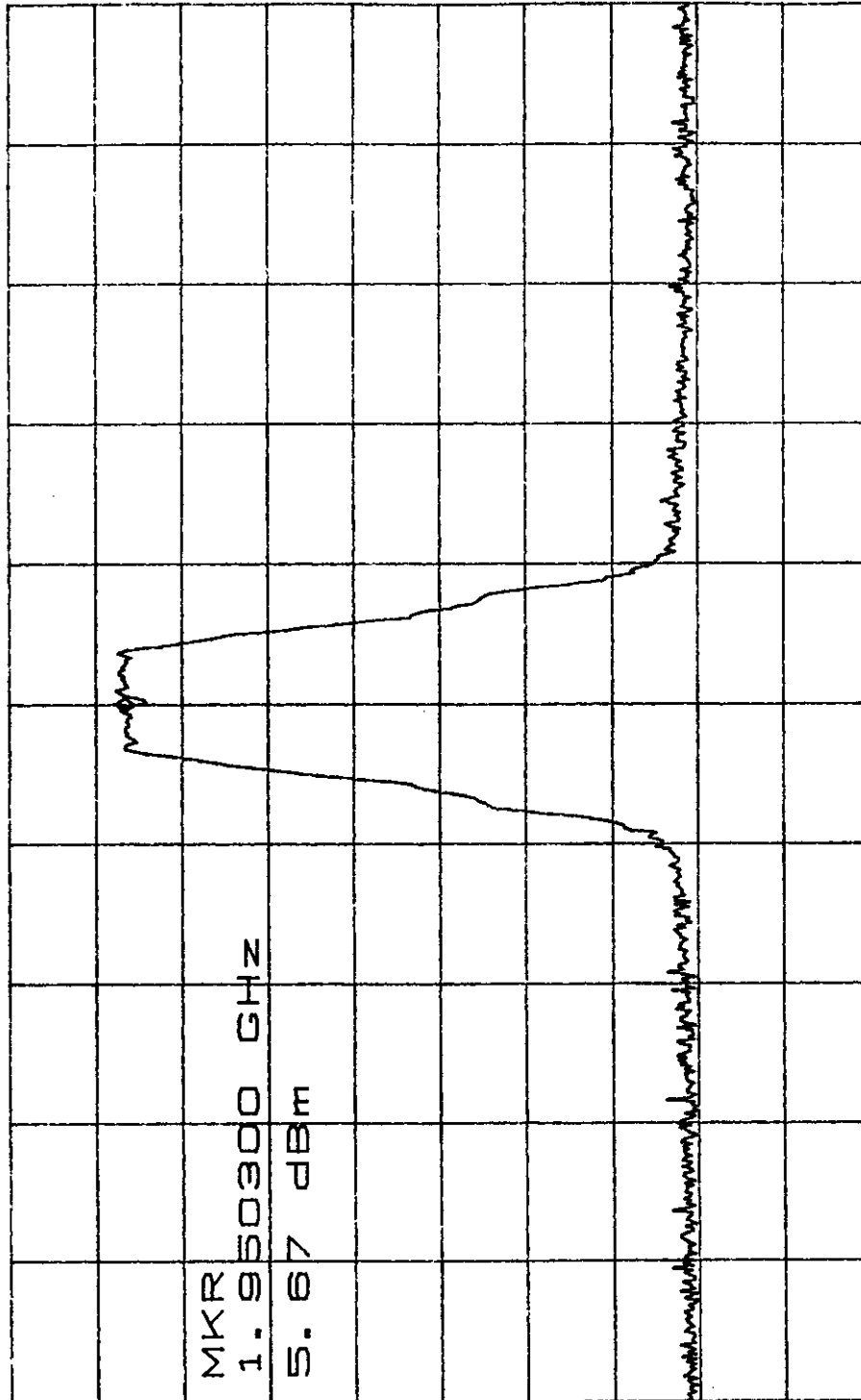
DL Inputs: 1950.2 MHz
1950.4 MHz
(GSM Sources)
for PCS 192

ATTEN 30dB

RL 20.0dBm

MKR 5.67dBm

1.950300GHZ



2-tone

MKR
1.950300 GHZ
5.67 dBm

Tested by ORTEL CORPORATION.

SPAN 5.000MHZ
SWP 50.0ms

CENTER 1.950300GHZ
*RBW 30kHz *VBW 30kHz

3 RADIATED EMISSION DATA

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 20 GHz were performed in a horizontal and vertical polarization at the following test location :

- Test not applicable

- Roof (Small Open Area Test Site)
- Canyon #1 (10- and 30-Meter Open Area Test Site), Carroll Canyon, San Diego
- Canyon #2 (3- and 10-Meter Open Area Test Site), Carroll Canyon, San Diego

Testing was performed at a test distance of:

- 1 meters
- 3 meters
- 10 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.
<input checked="" type="checkbox"/> - 8566B	407	Spectrum Analyzer	Hewlett Packard	2311A02209
<input type="checkbox"/> - 85662B	406	Spectrum Analyzer Display	Hewlett Packard	2309A04682
<input type="checkbox"/> - 3115	453	Antenna, Double Ridge Guide	EMCO	9412-4363
<input checked="" type="checkbox"/> - 3115	251	Antenna, Double Ridge Guide	EMCO	2495
<input type="checkbox"/> - AFD3-0102-13-ST	366	Pre-Amplifier (38 dB gain), 1 to 2 GHz	Miteq, Inc.	16429
<input checked="" type="checkbox"/> - AFD3-0208-40-ST	367	Pre-Amplifier (30 dB gain), 2 to 8 GHz	Miteq, Inc.	155382
<input type="checkbox"/> - AFS4-08001800-70-10P-4	368	Pre-Amplifier (22 dB gain), 8 to 18 GHz	Miteq, Inc.	167
<input type="checkbox"/> - 91888-2	252	Horn Antenna (1 to 2 GHz)	Eaton	101
<input type="checkbox"/> - 91889-2	253	Horn Antenna (2 to 3.6 GHz)	Eaton	101
<input type="checkbox"/> - 91892-1	254	Reflector Antenna (3.6 to 18 GHz)	Eaton	--
<input type="checkbox"/> - 94613-1	255	Horn Antenna (3.6 to 7.6 GHz)	Eaton	--
<input type="checkbox"/> - 91891-2	256	Horn Antenna (7.3 to 12 GHz)	Eaton	--
<input type="checkbox"/> - 94614-1	257	Horn Antenna (12 to 18 GHz)	Eaton	--

Remarks: _____