TÜV PRODUCT SERVICE

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:	Mirror Cell PCS Repeater, Model CSR-1902-2 (C-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:** **of the intended date of announcement of the product so that the grant can be issued on that date.**	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:

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

TÜV PRODUCT SERVICE

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

1 GENERAL INFORMATION

1.1 Product Description

Mirror Cell PCS Repeater, Model CSR-1902-2

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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
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

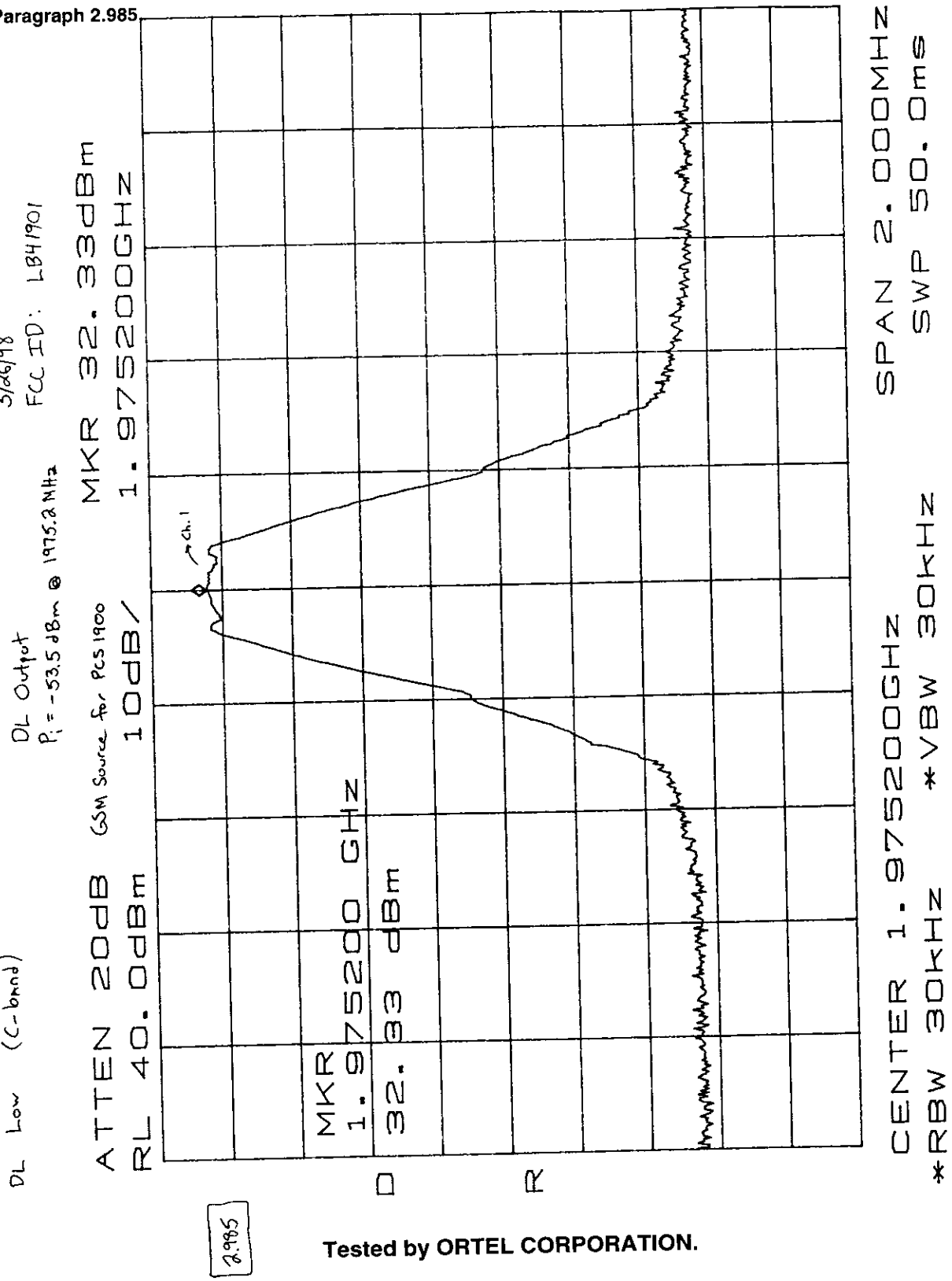
The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in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

2 CONDUCTED EMISSION DATA

ORTEL CORPORATION
Mirror Cell PCS Repeater, Model CSR-1902-2 (C-band)

See following page(s).

Part 2, Paragraph 2.985



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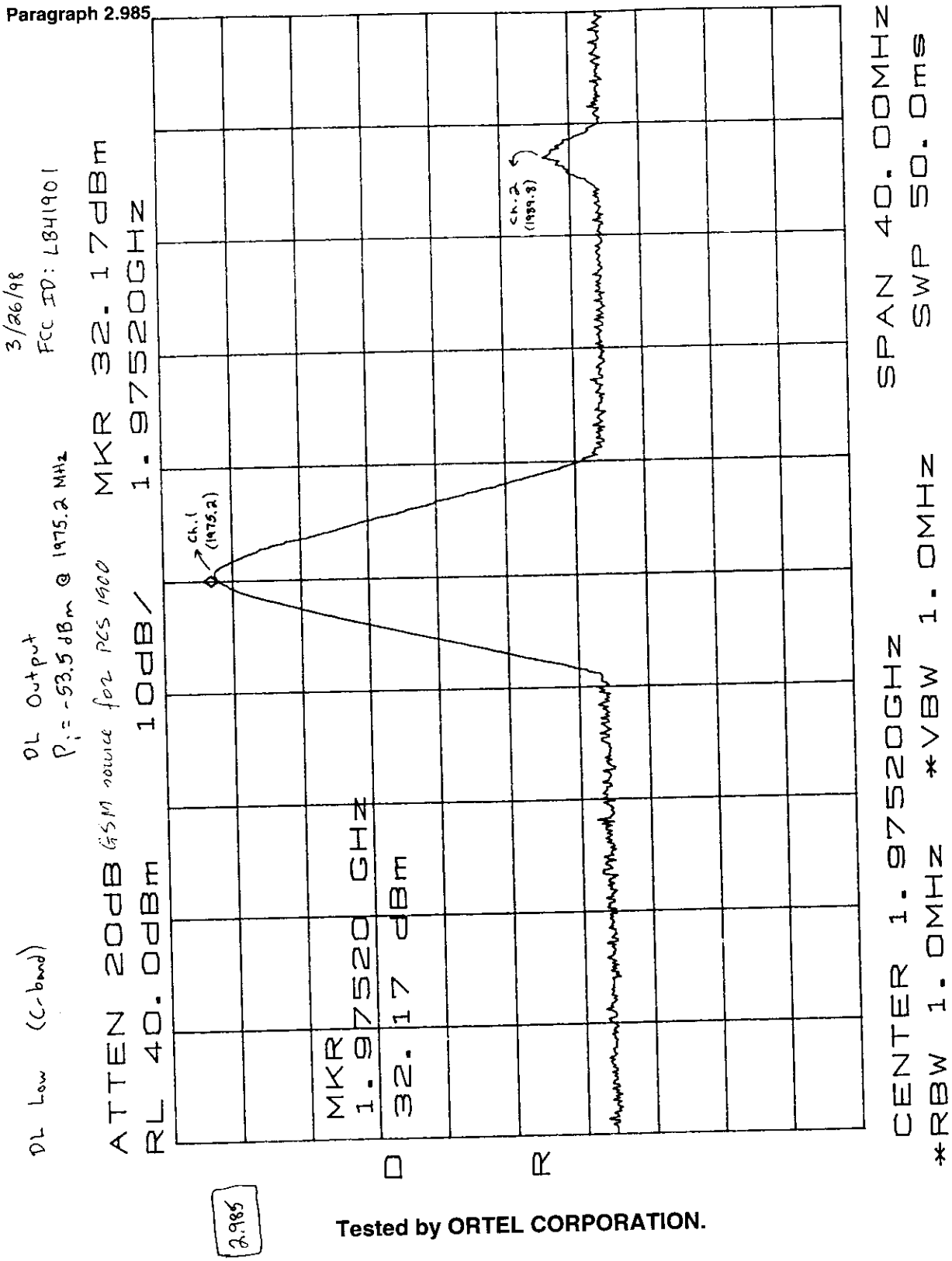

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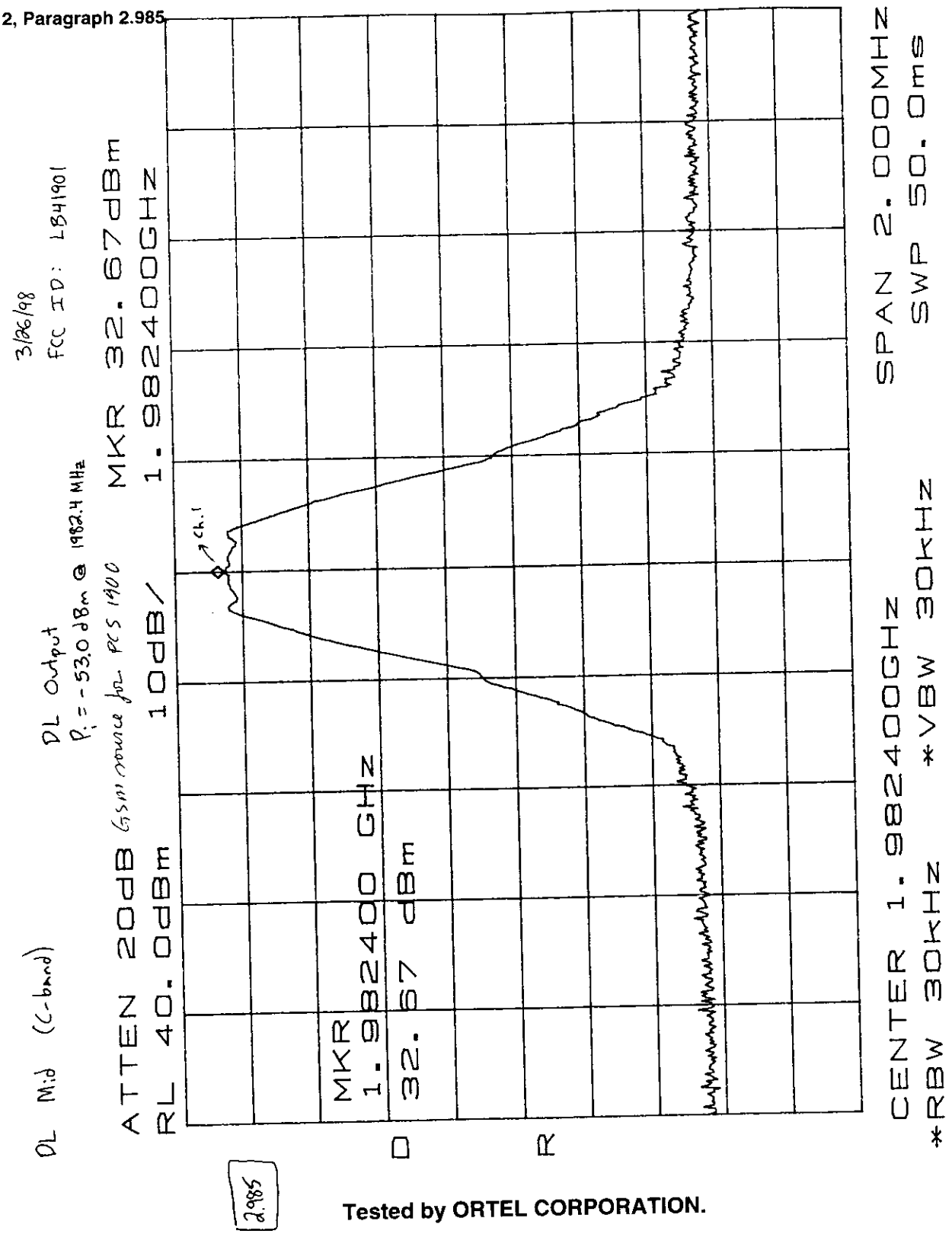

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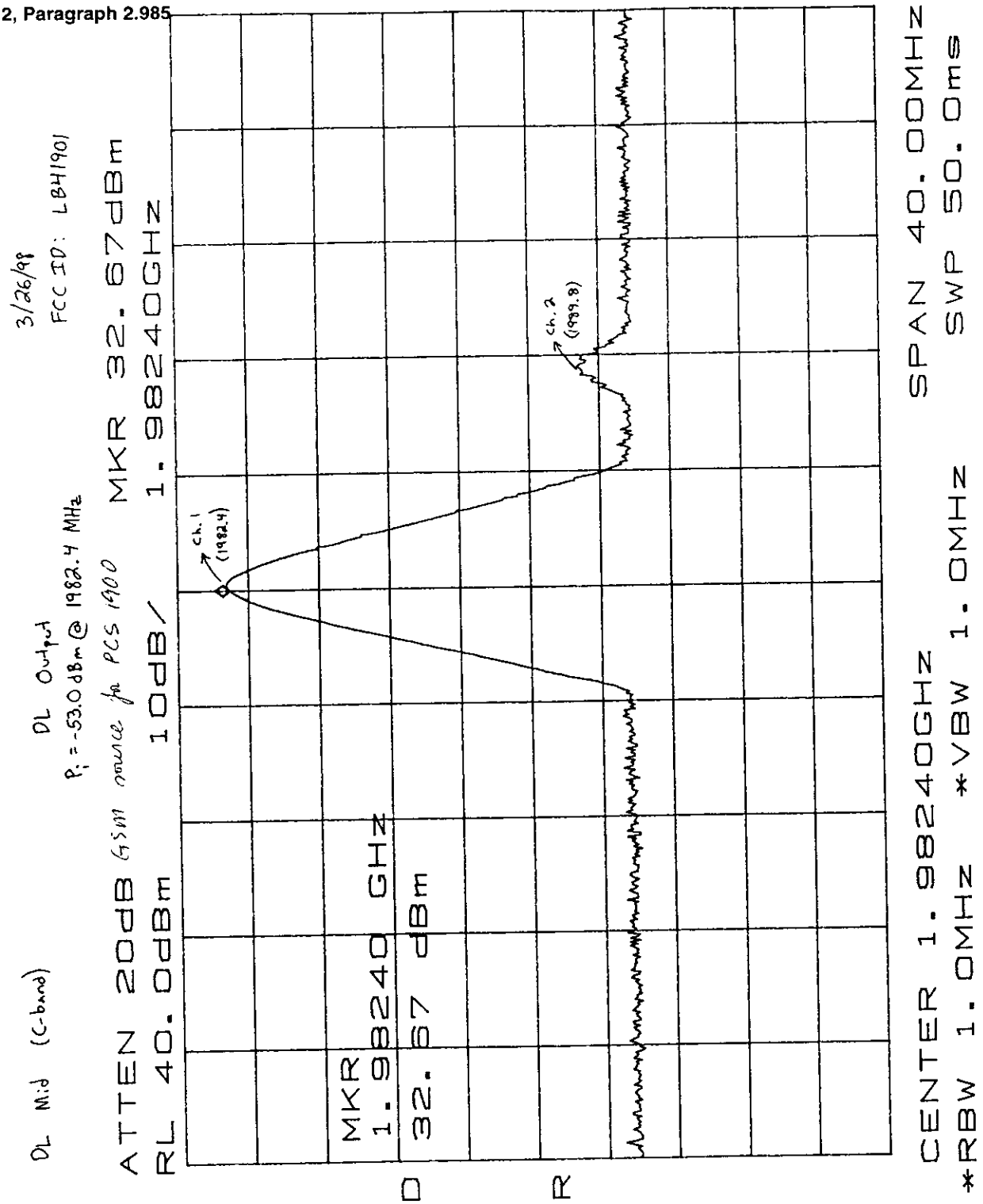

2.985

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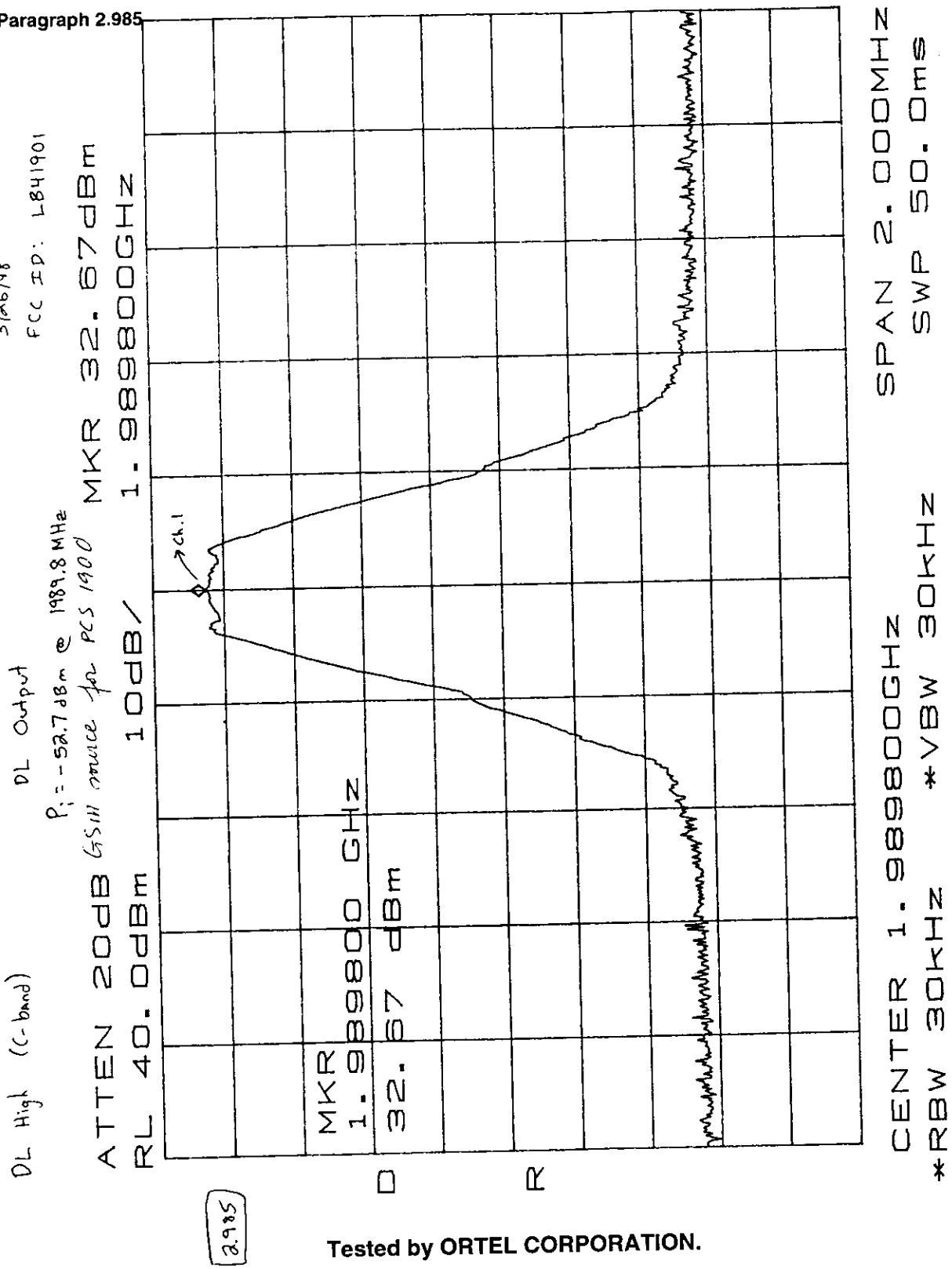

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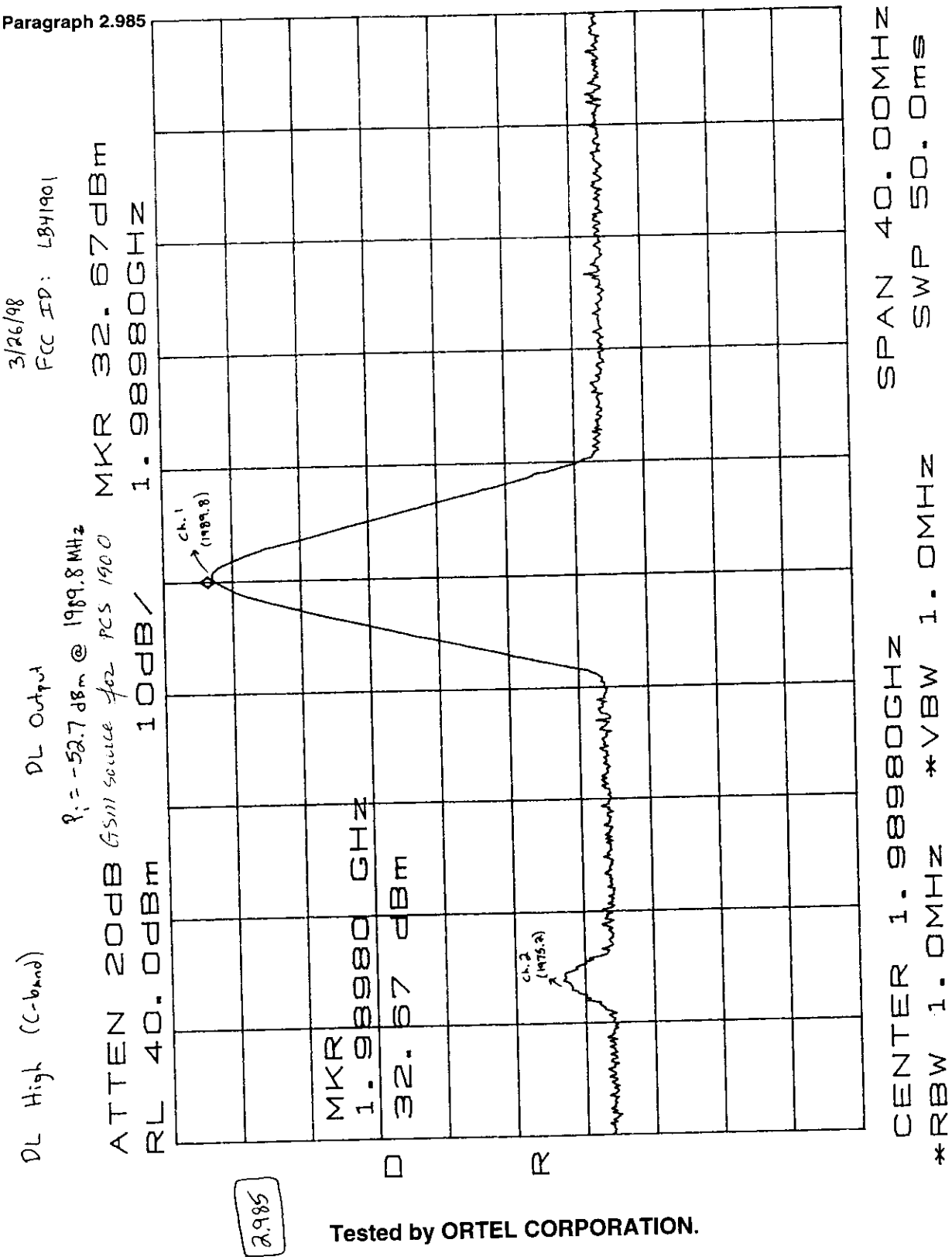

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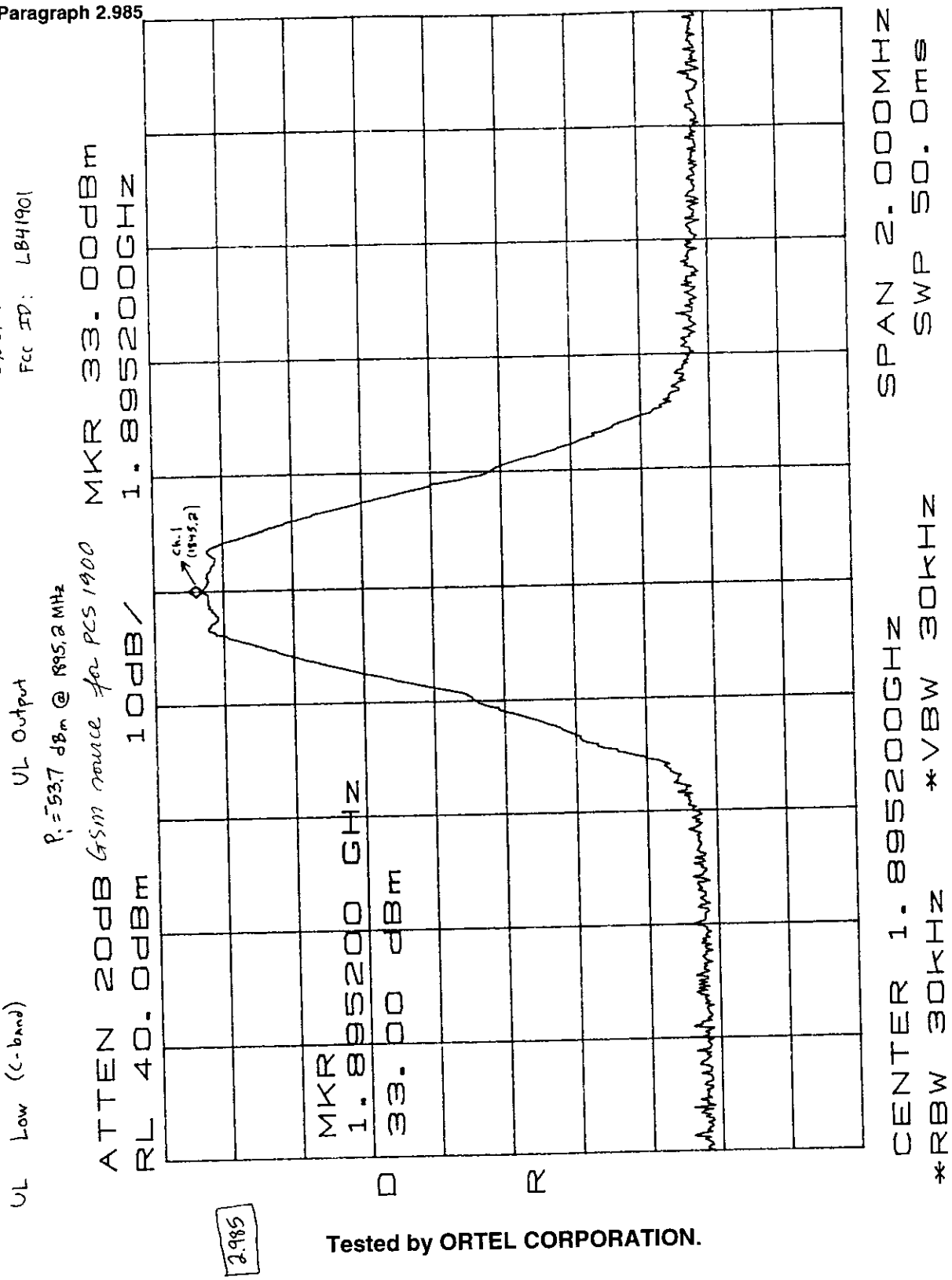

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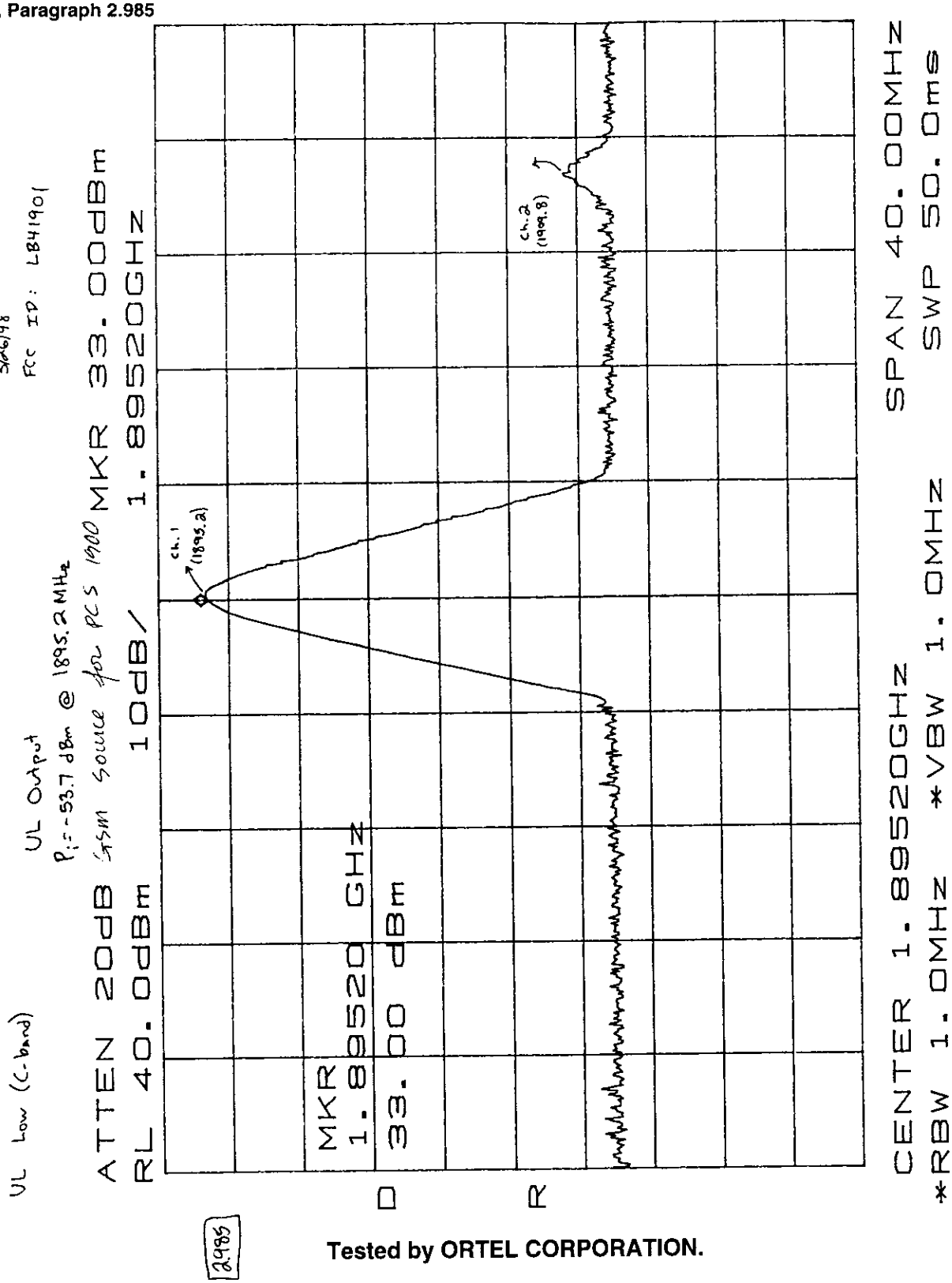

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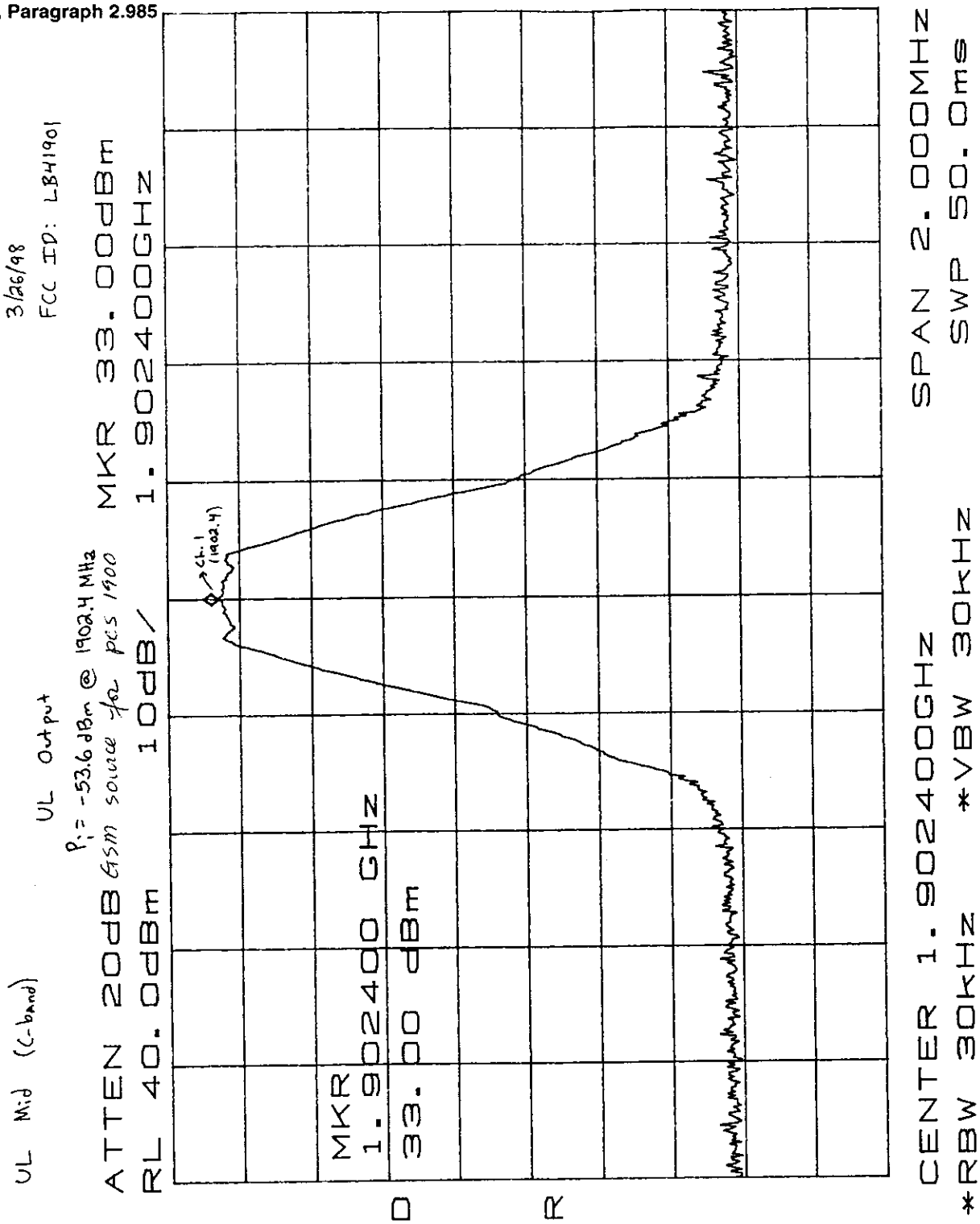

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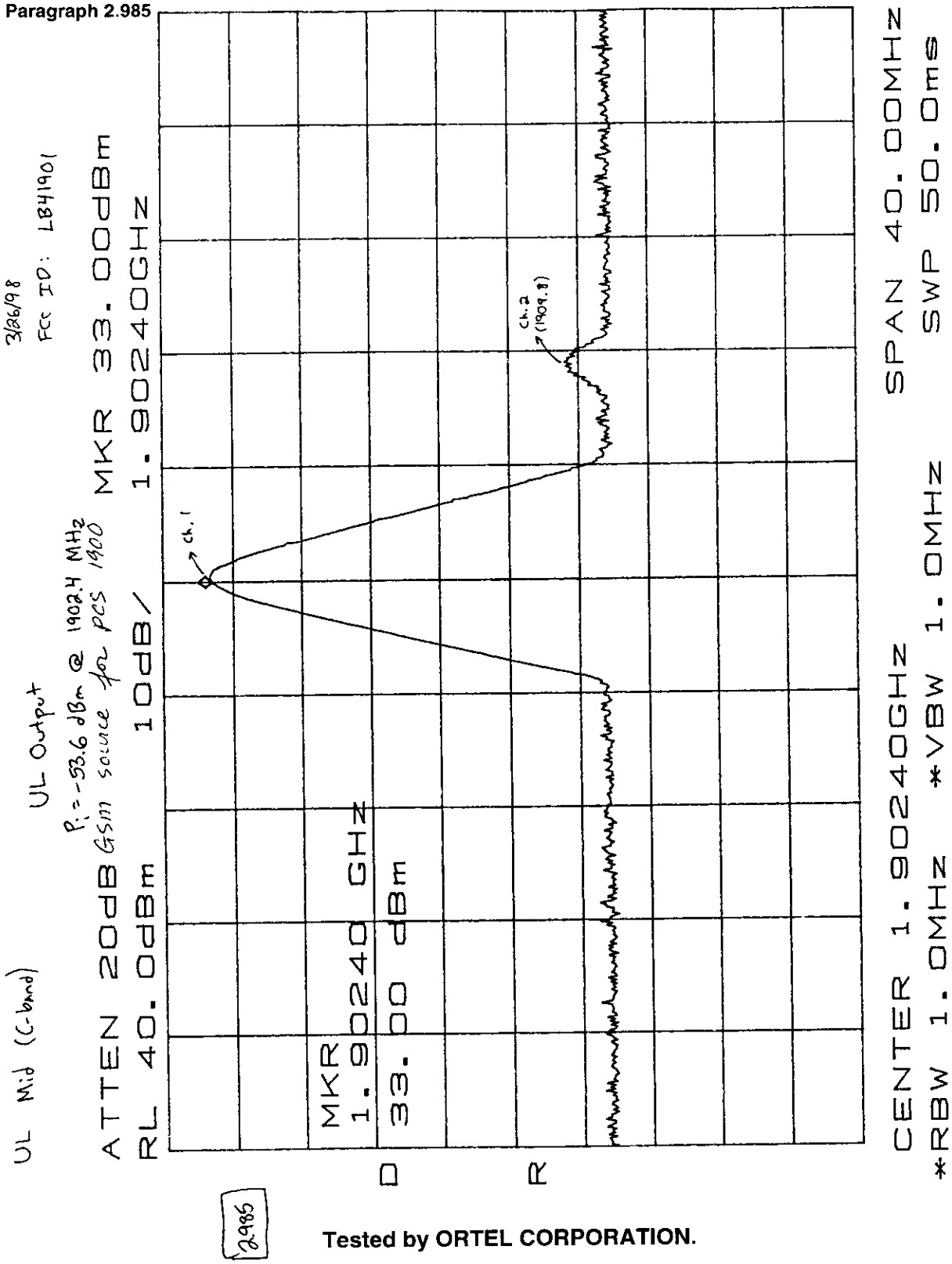

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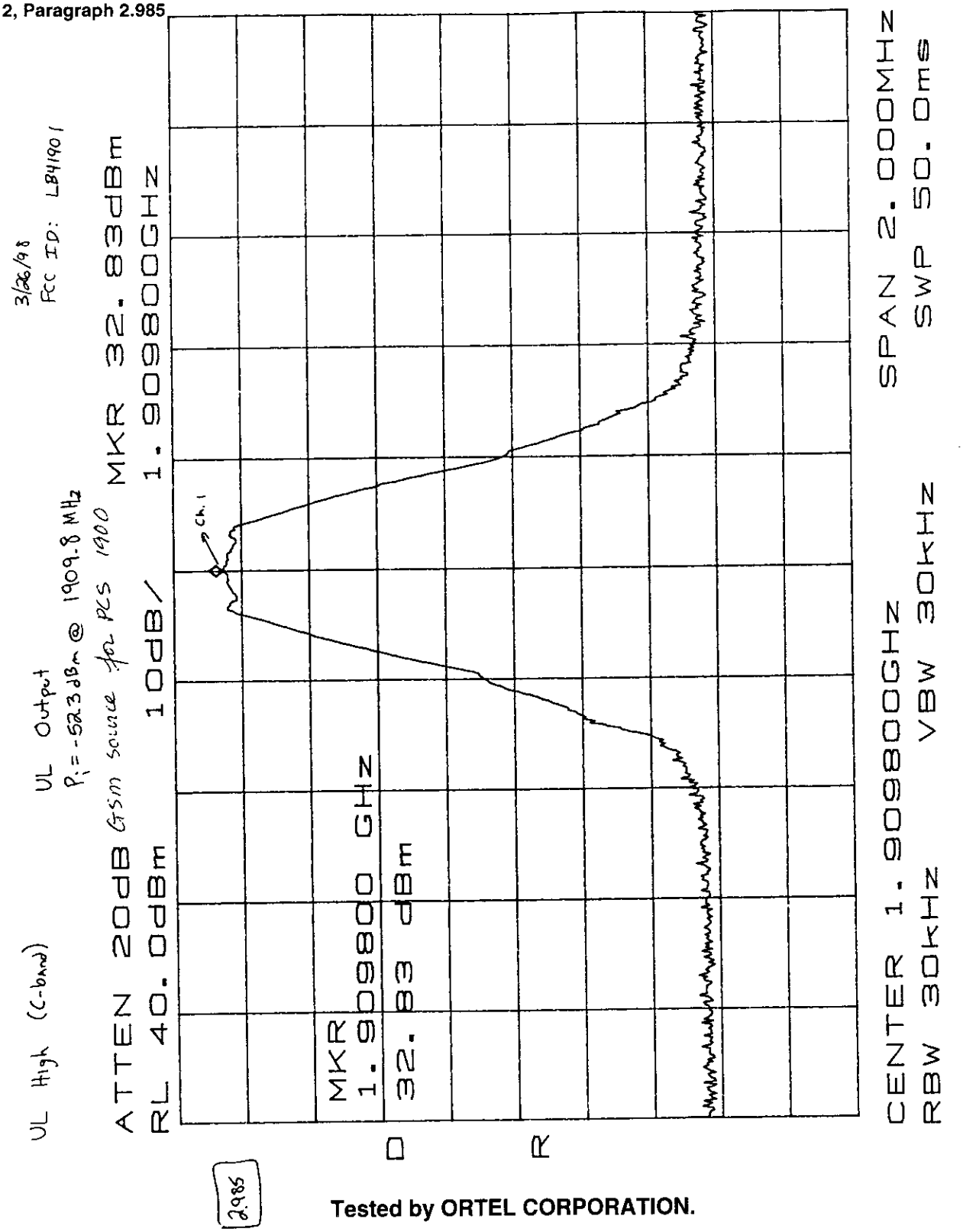

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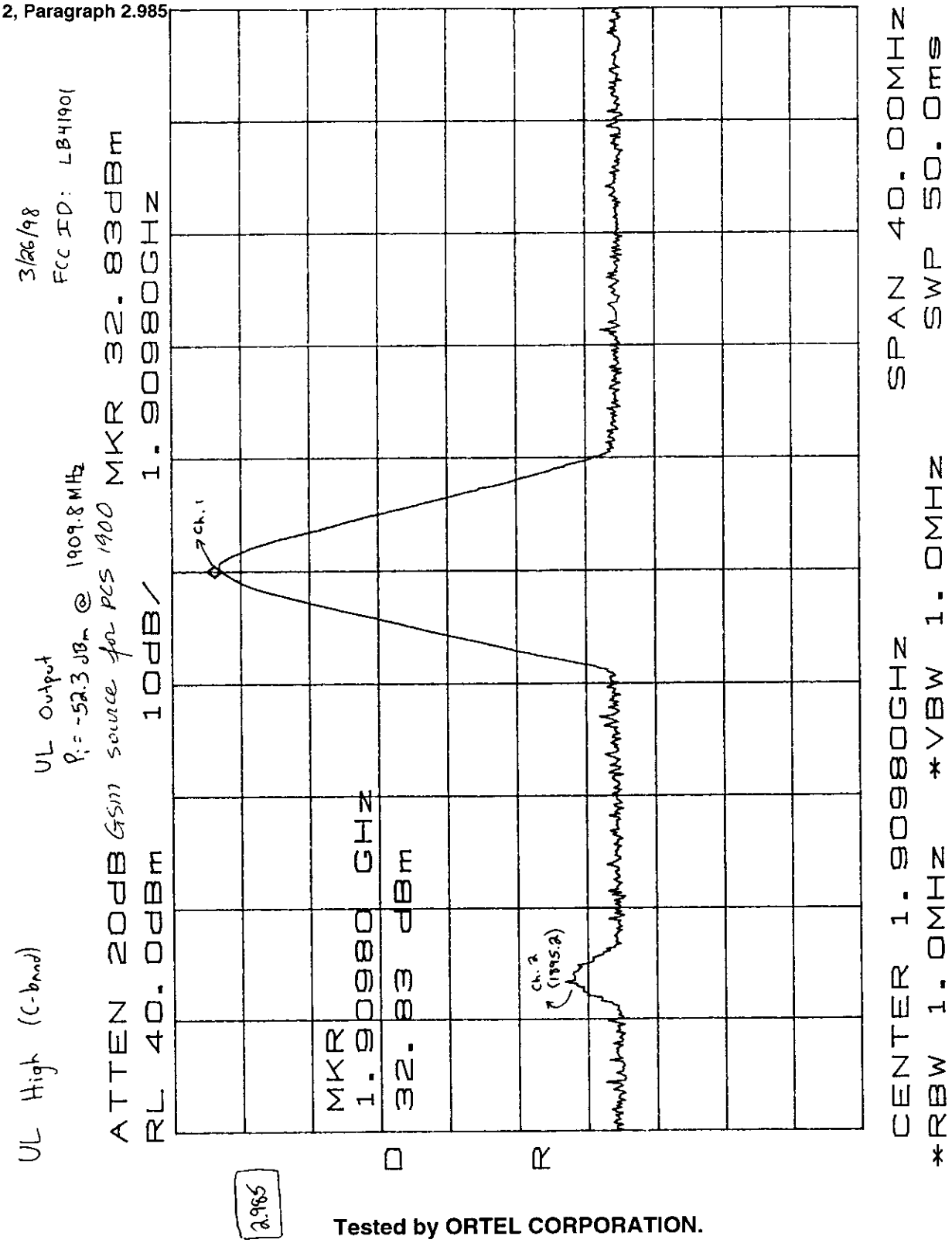

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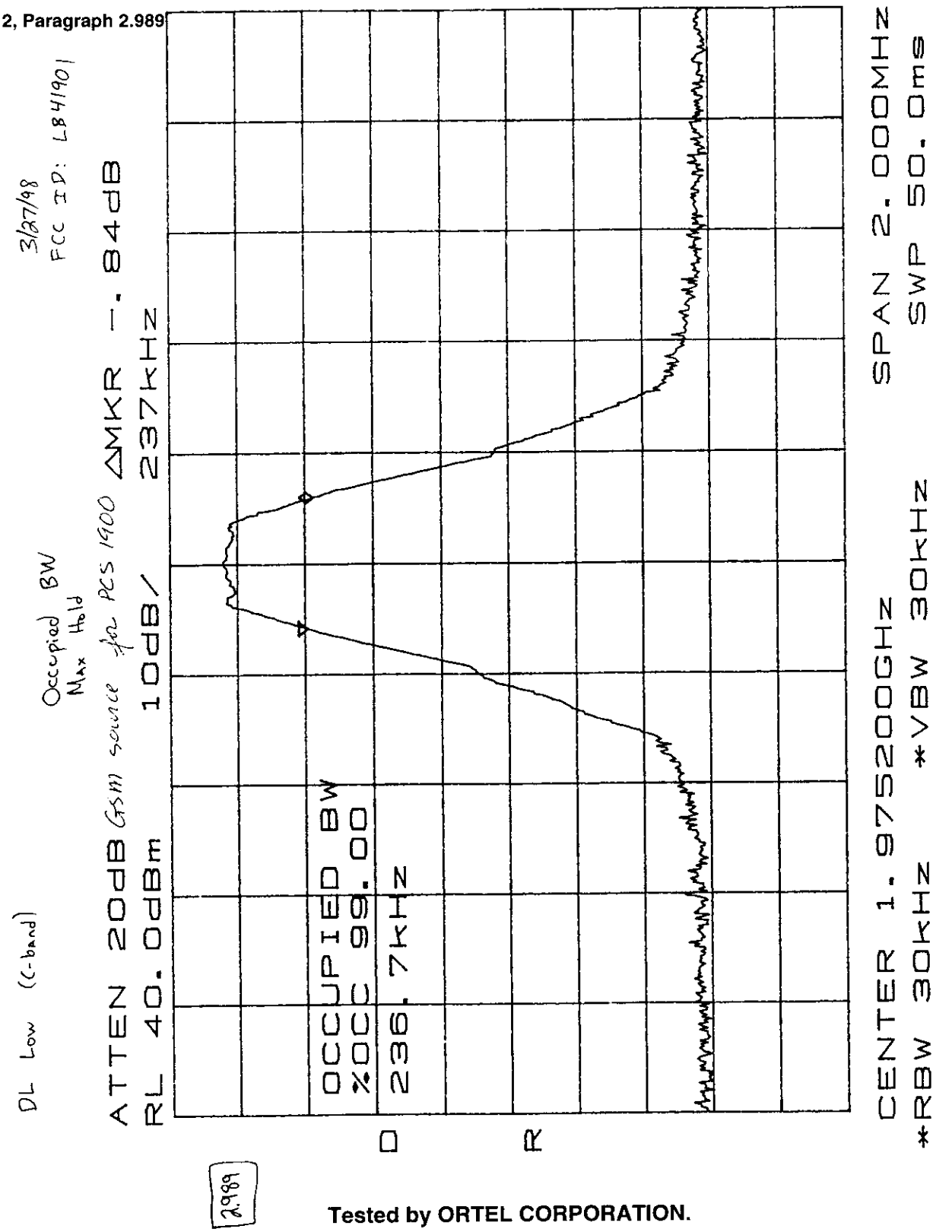

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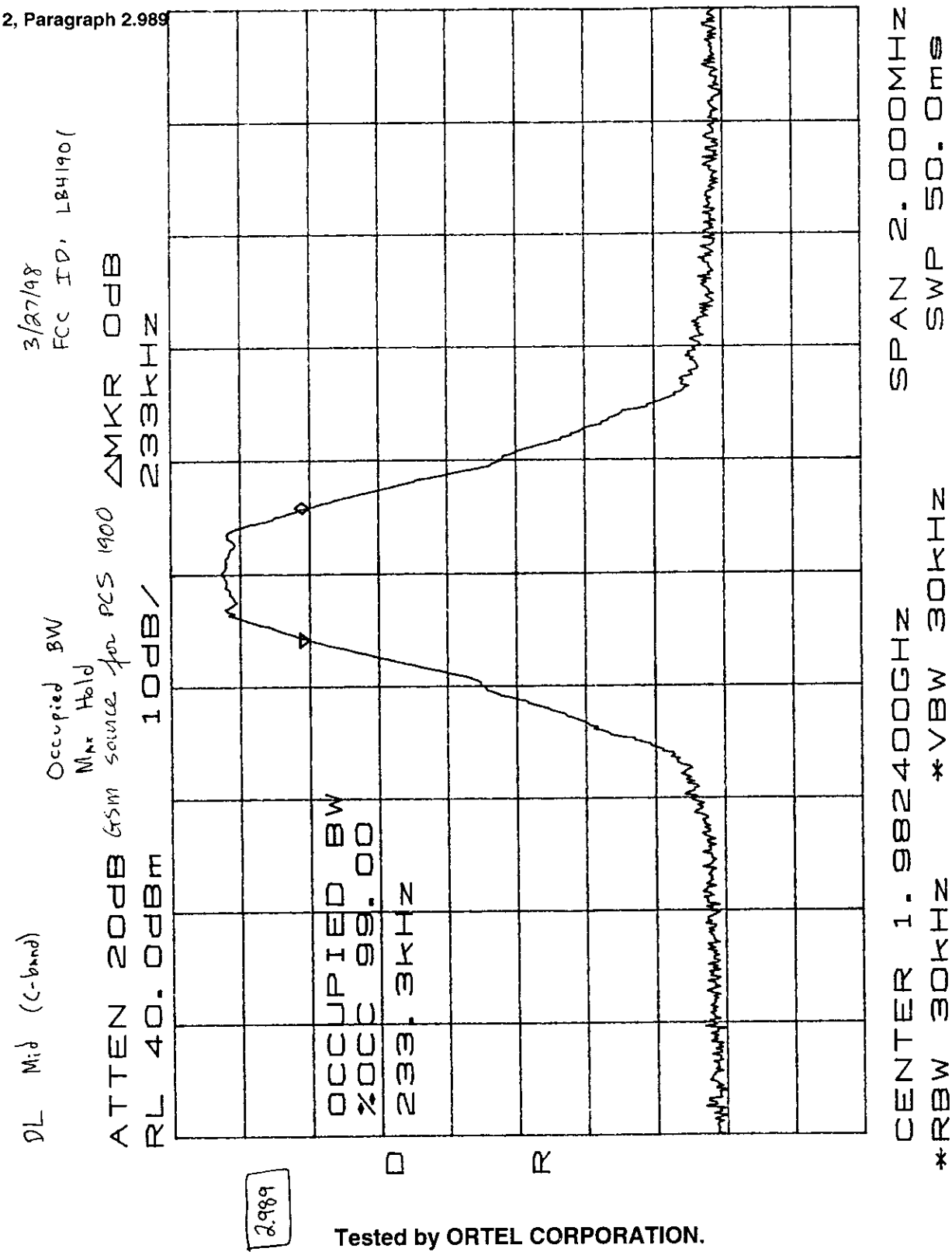

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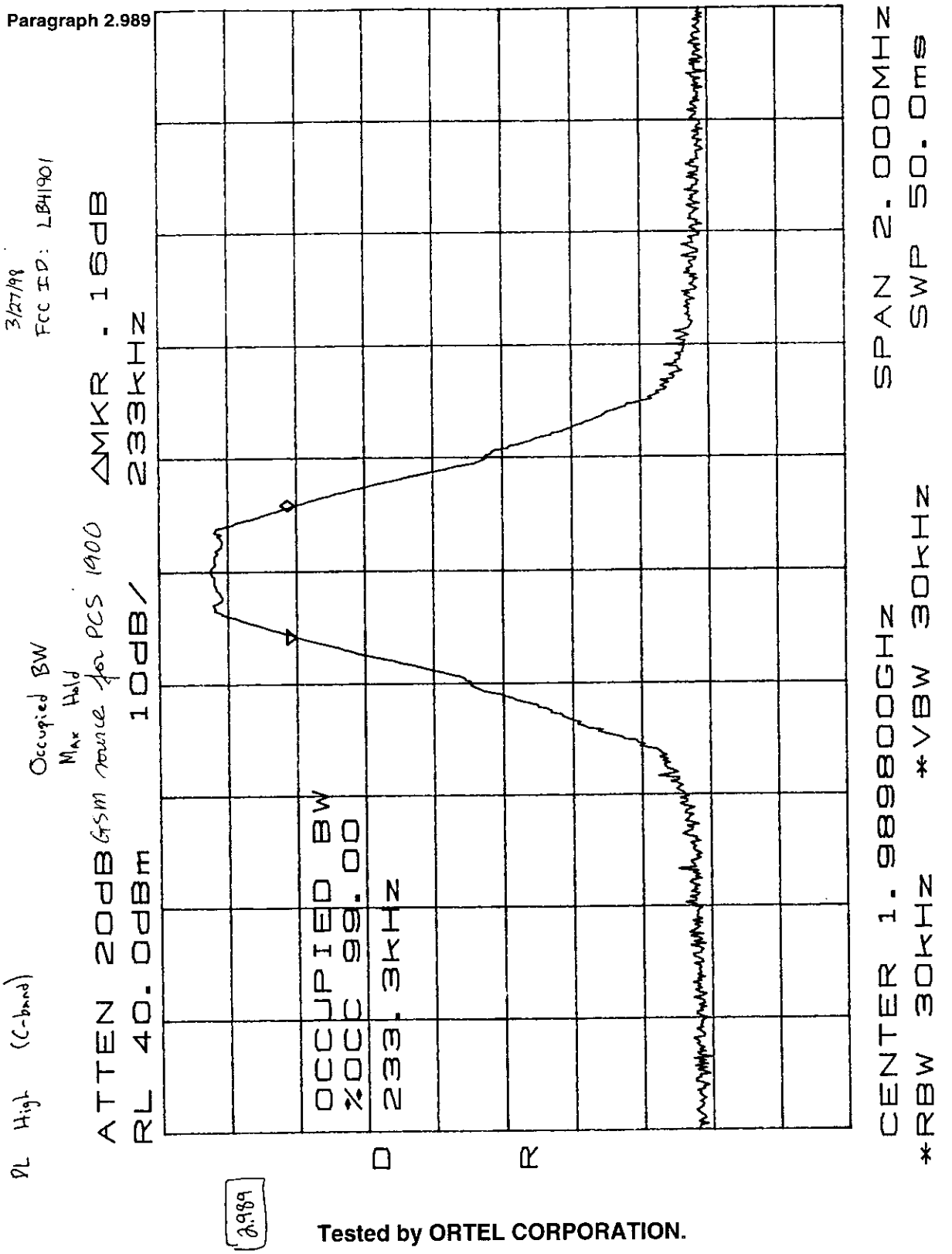

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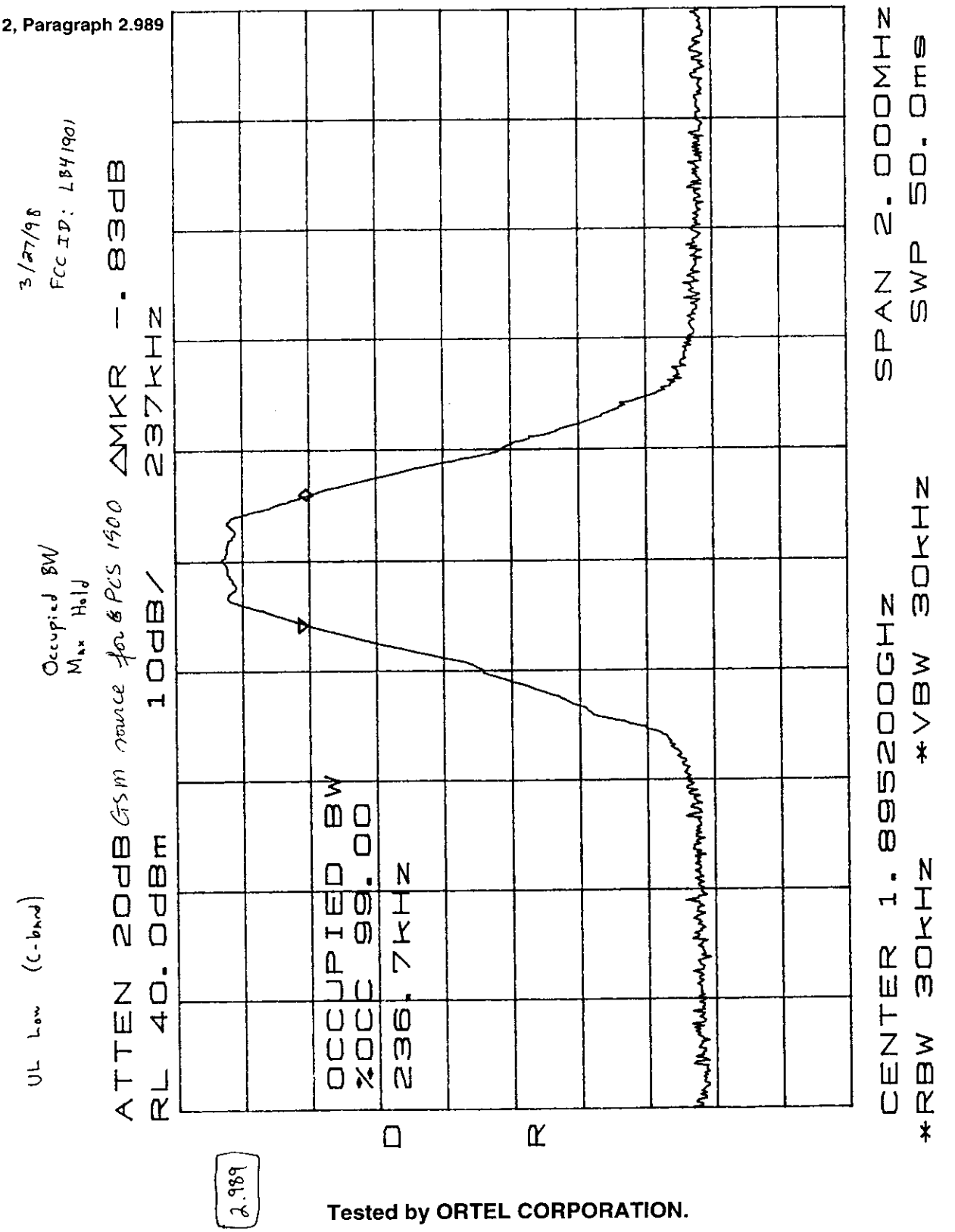

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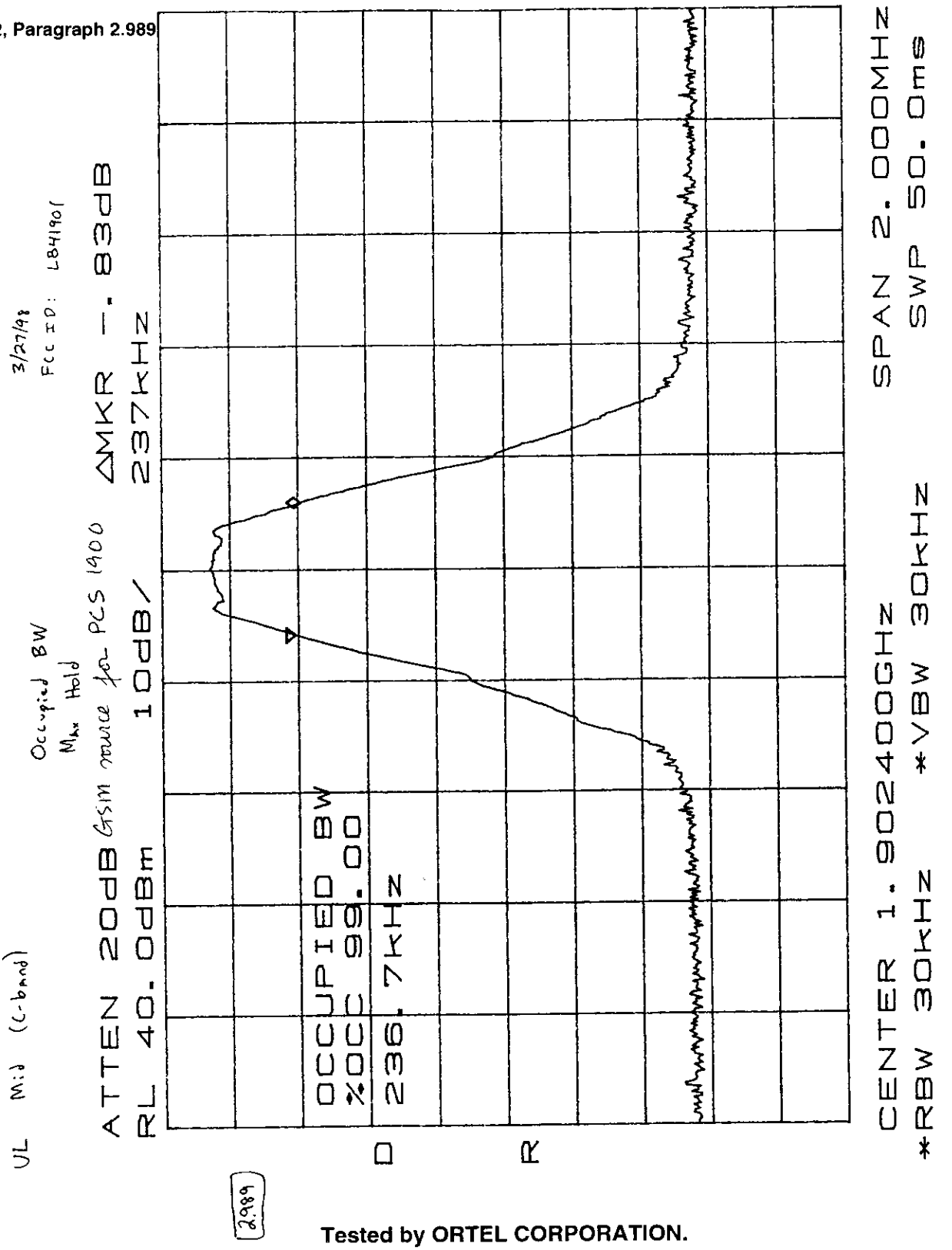

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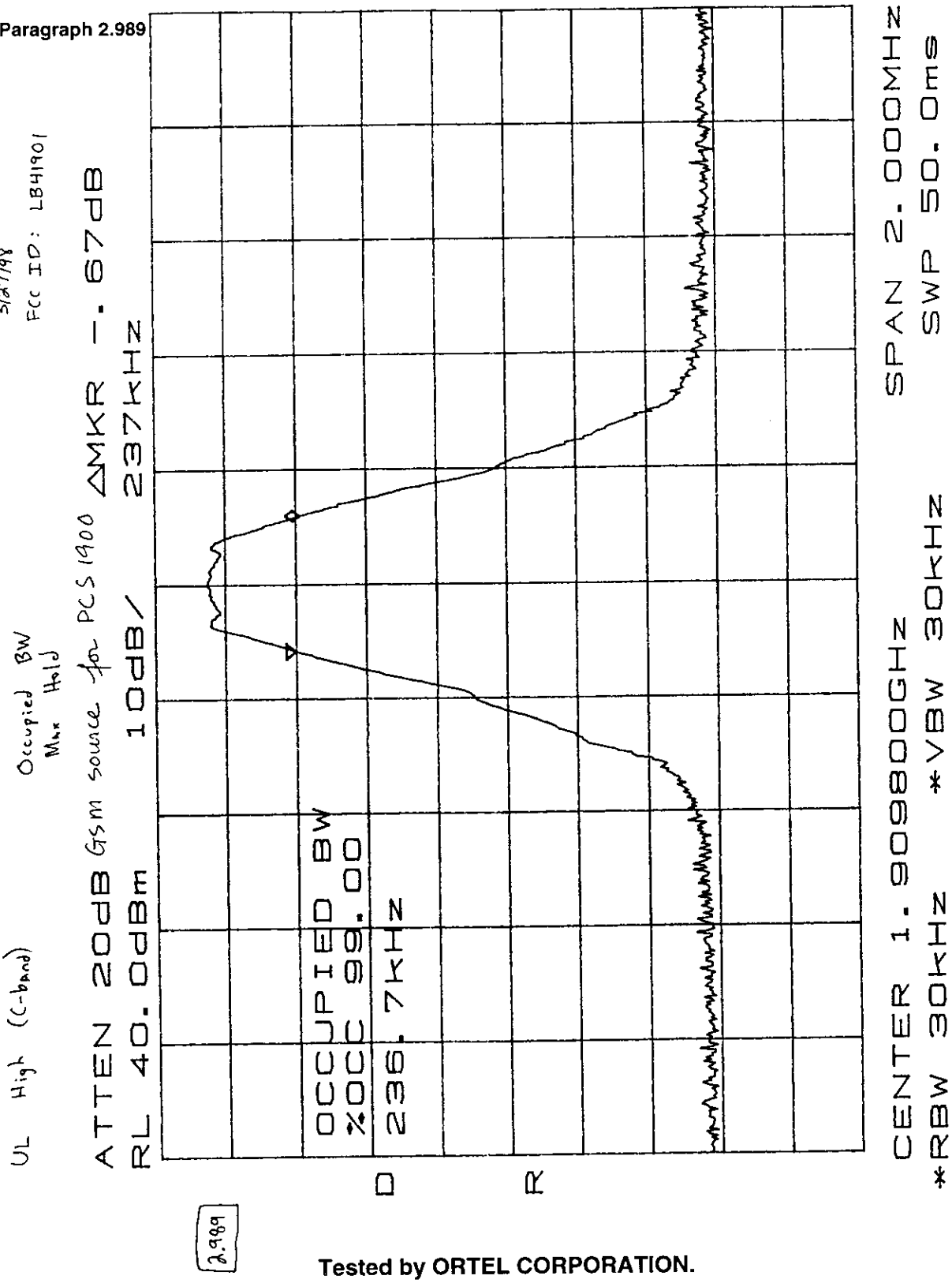

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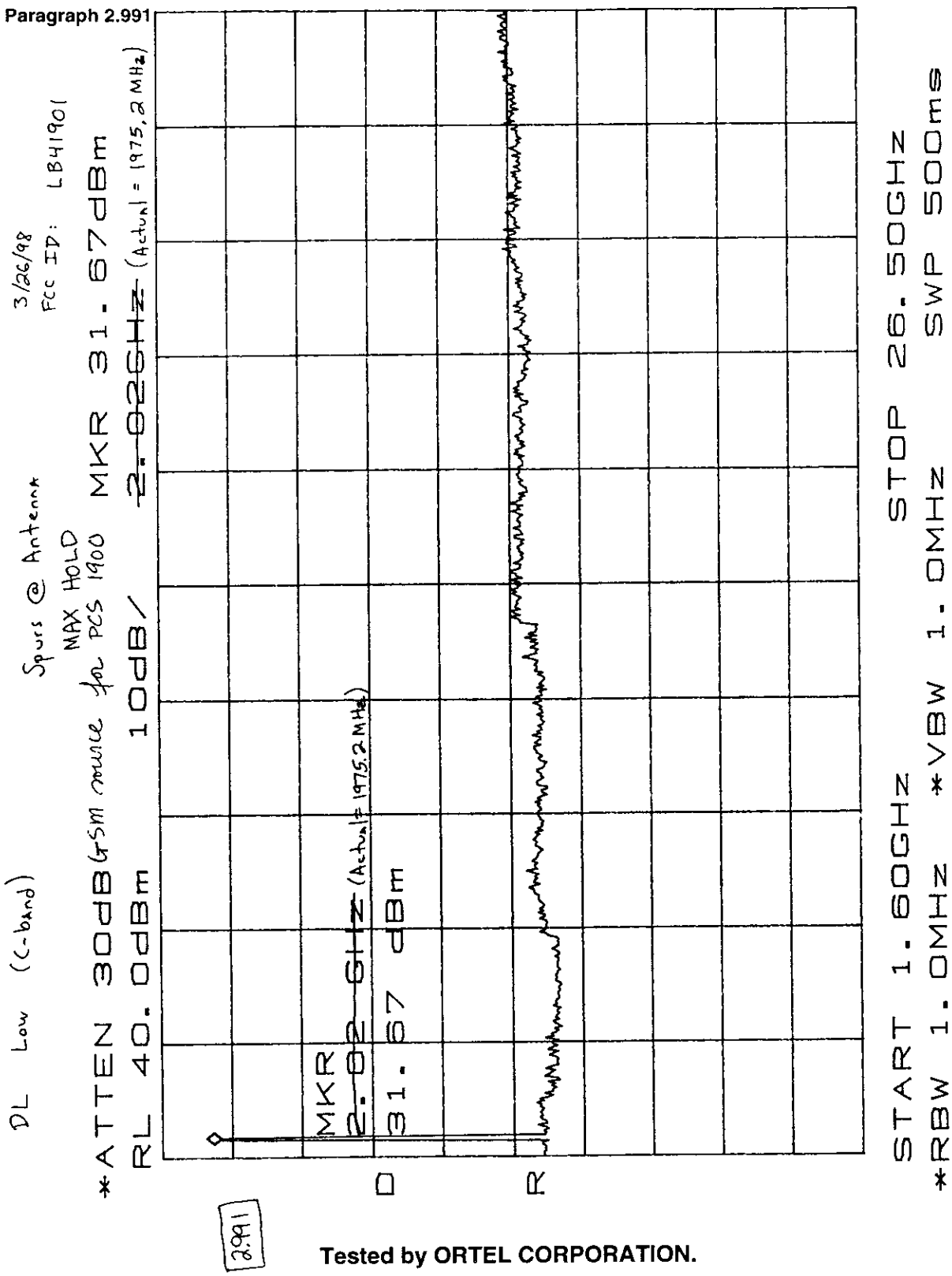

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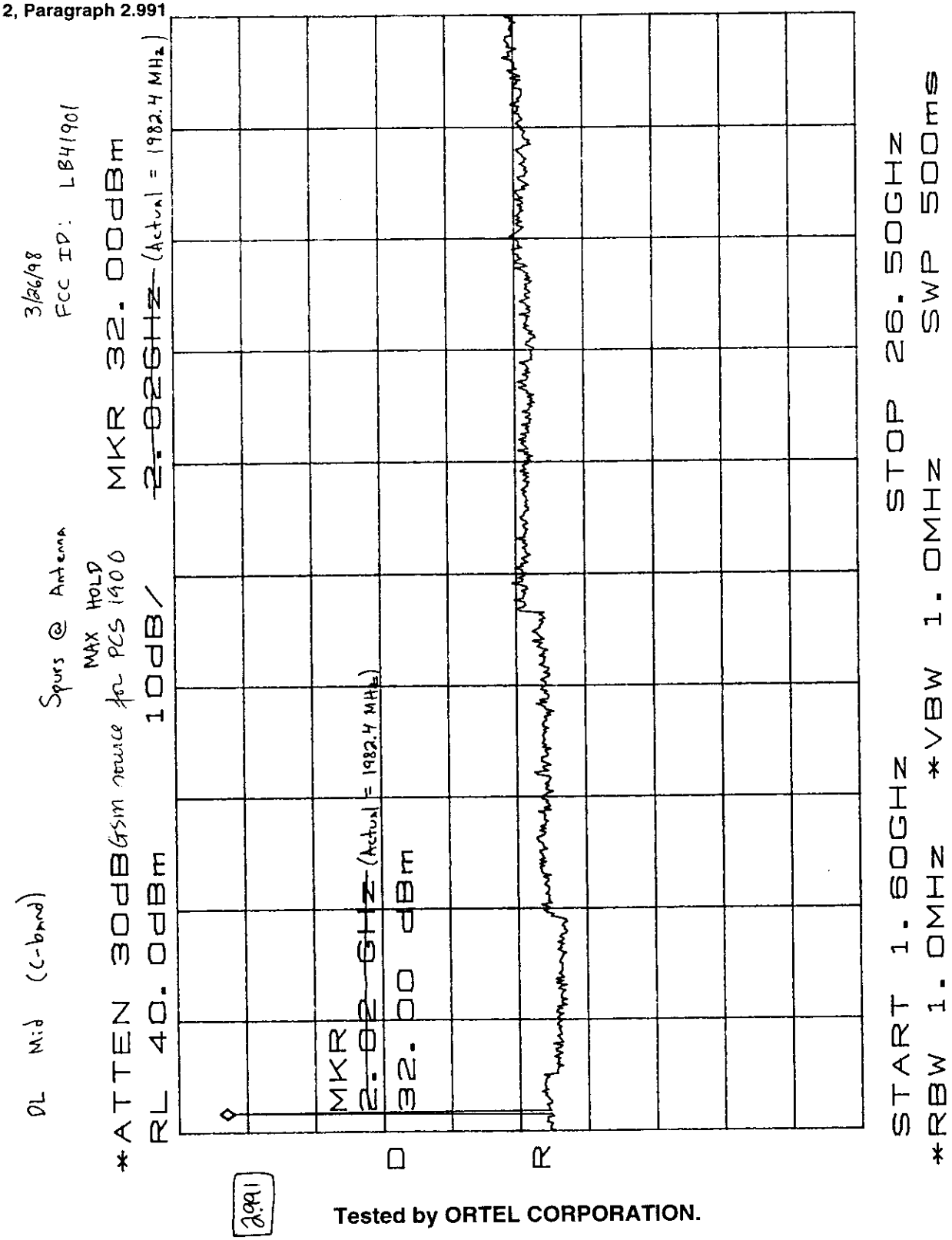

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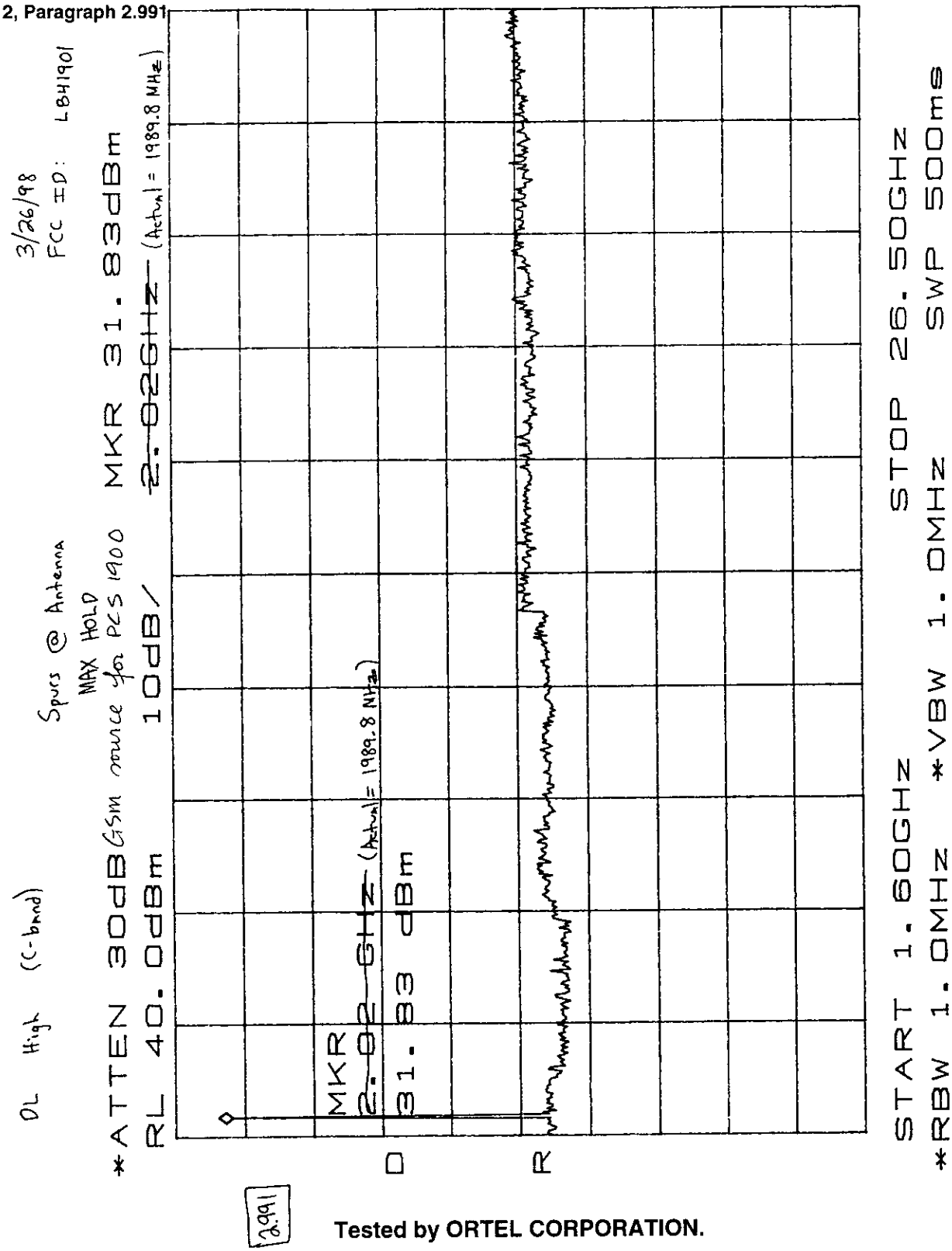

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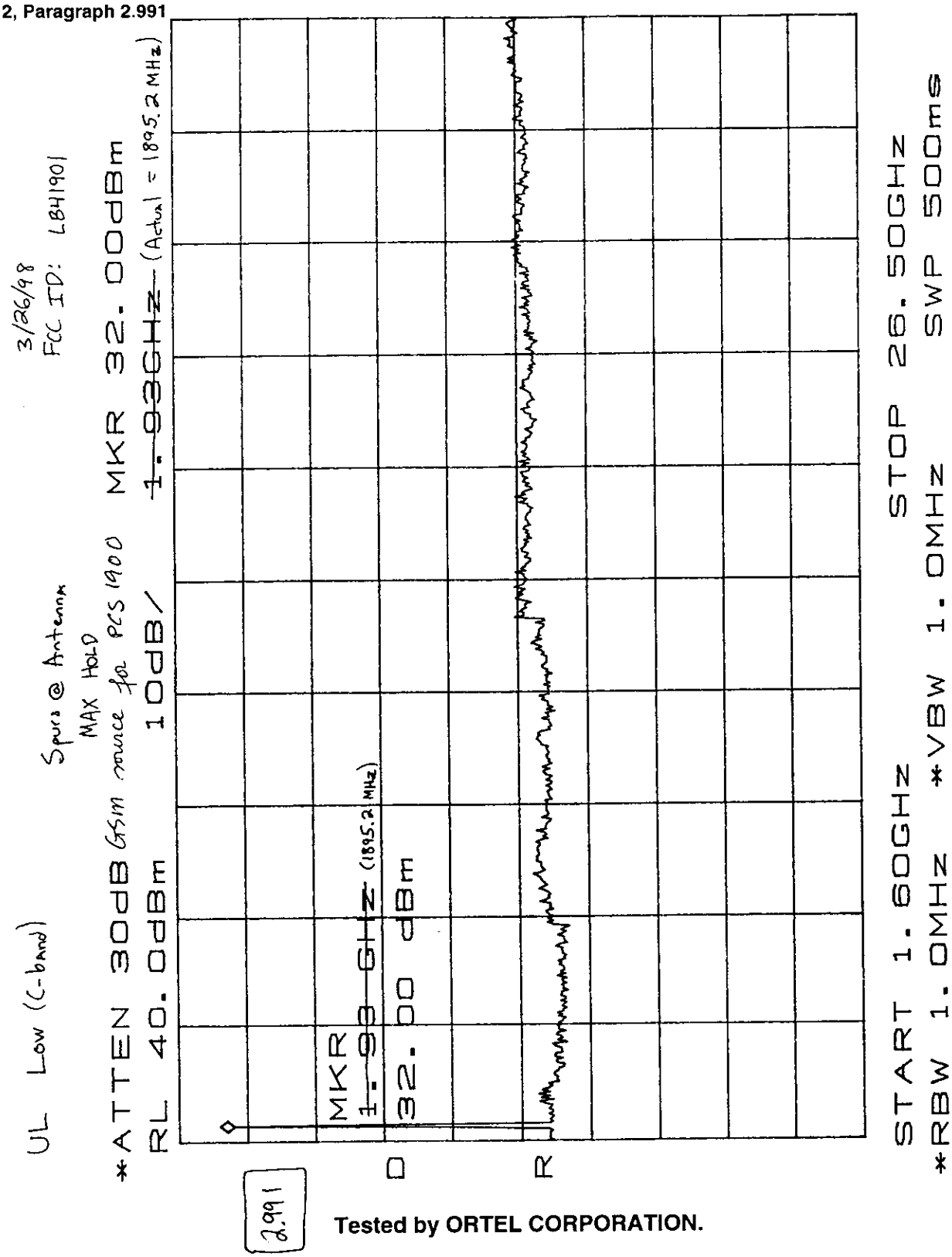

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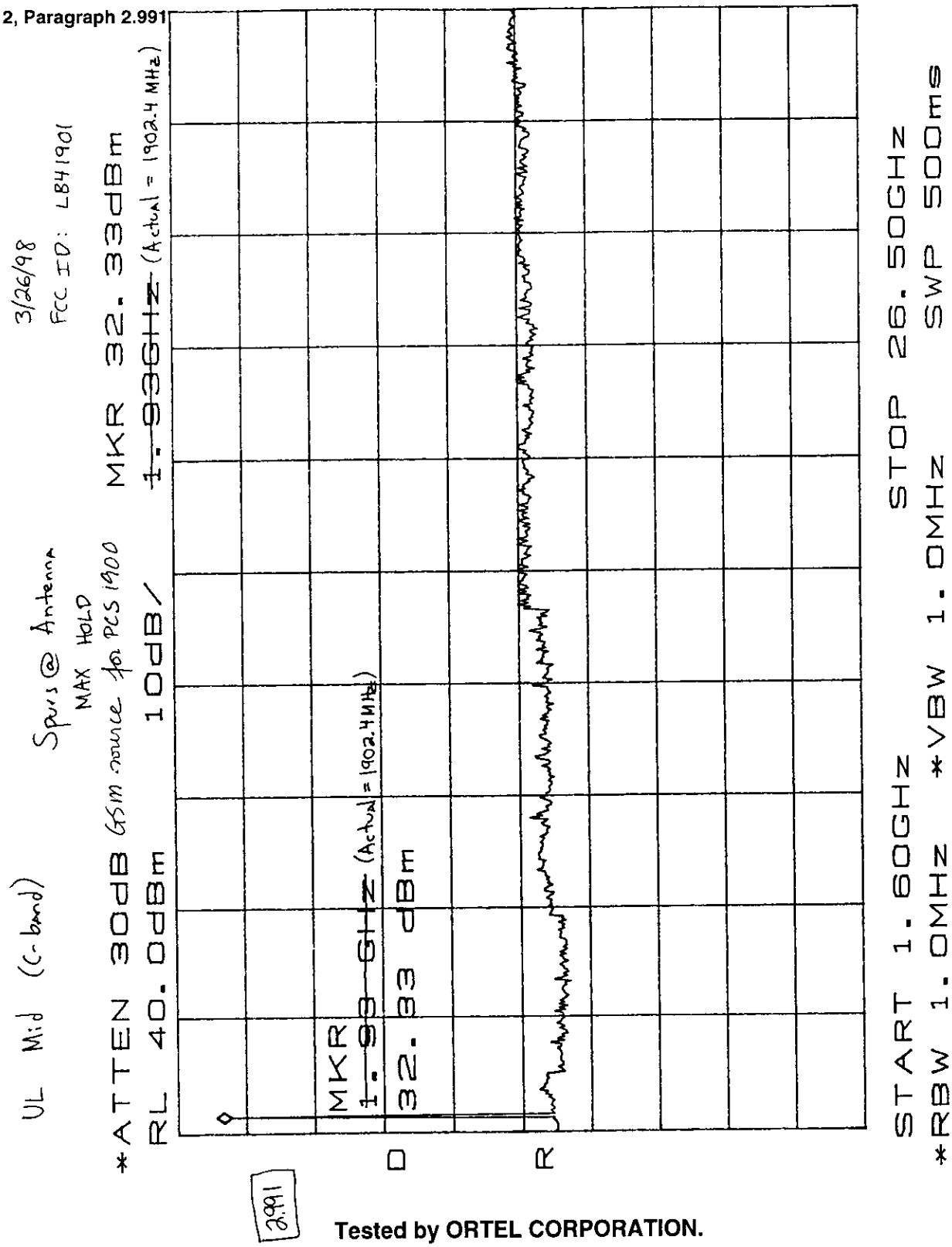

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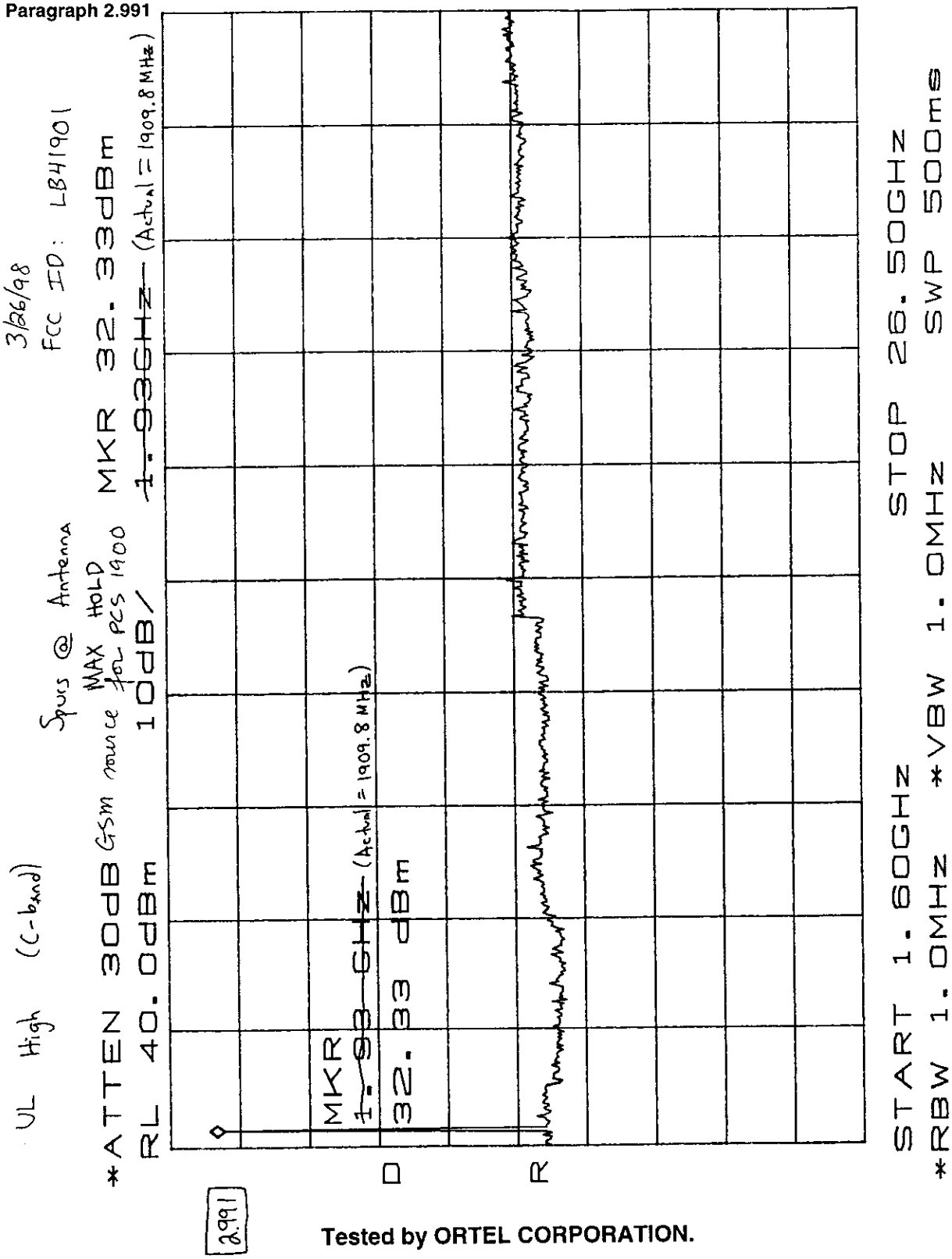

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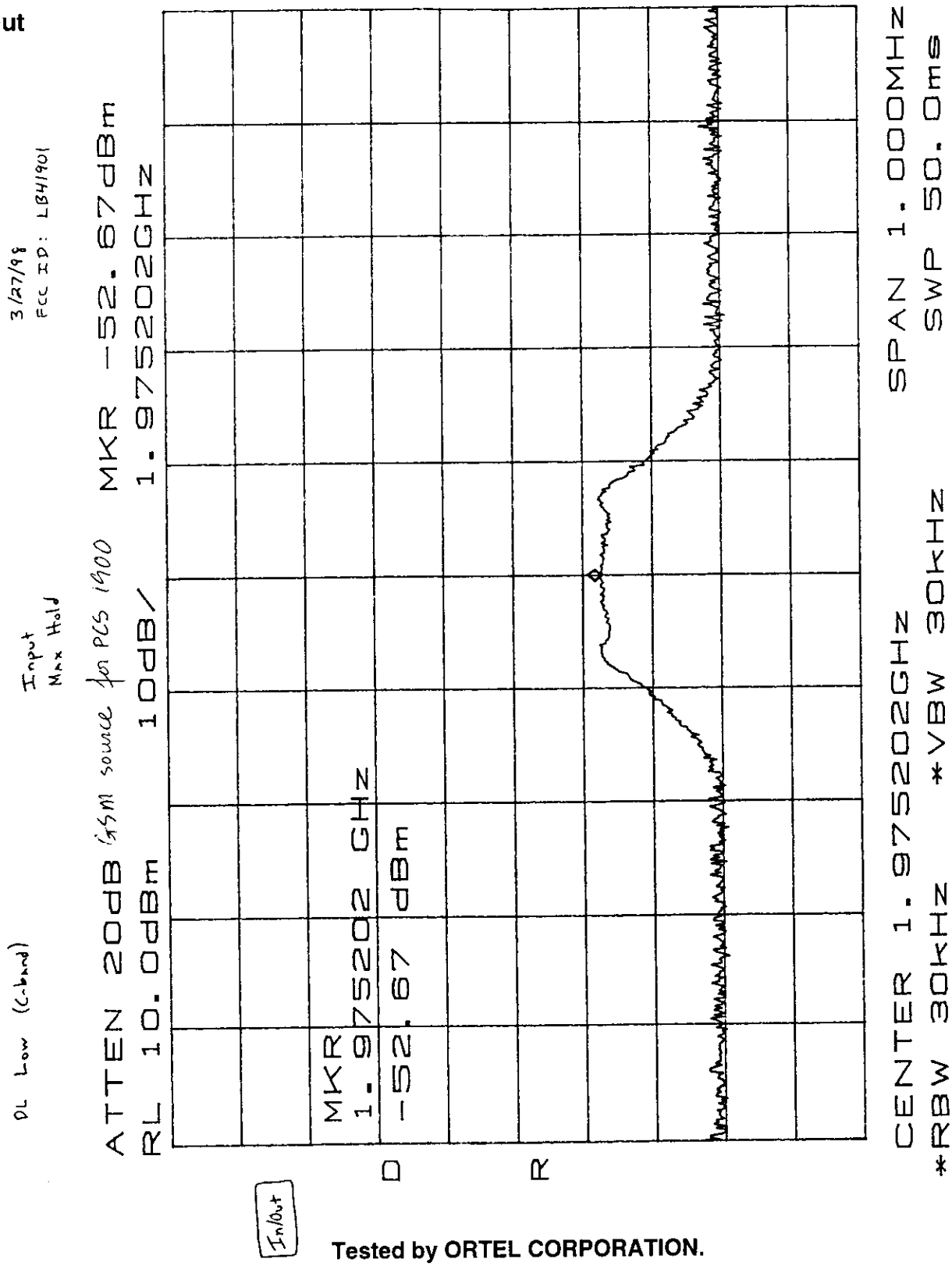

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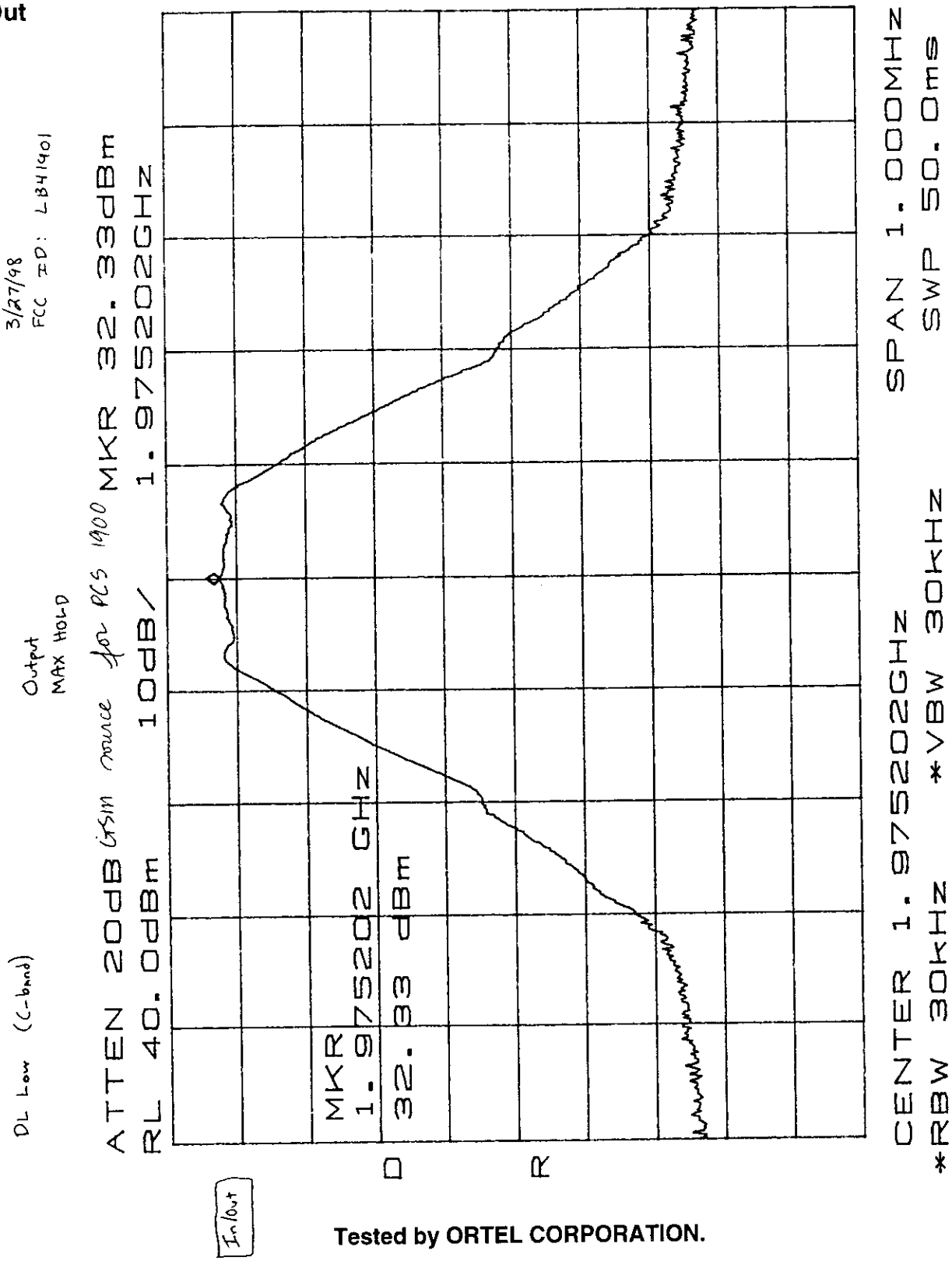

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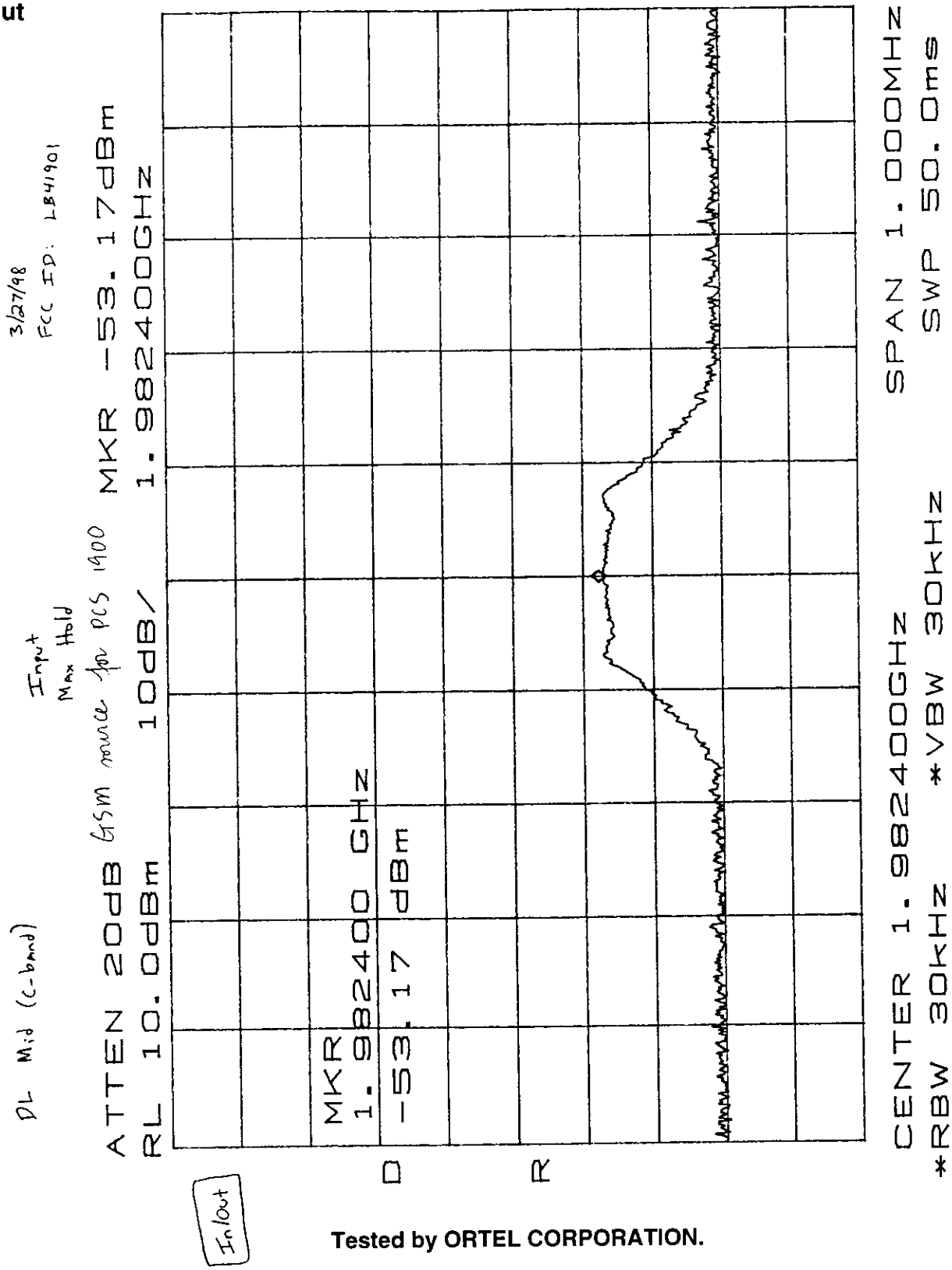

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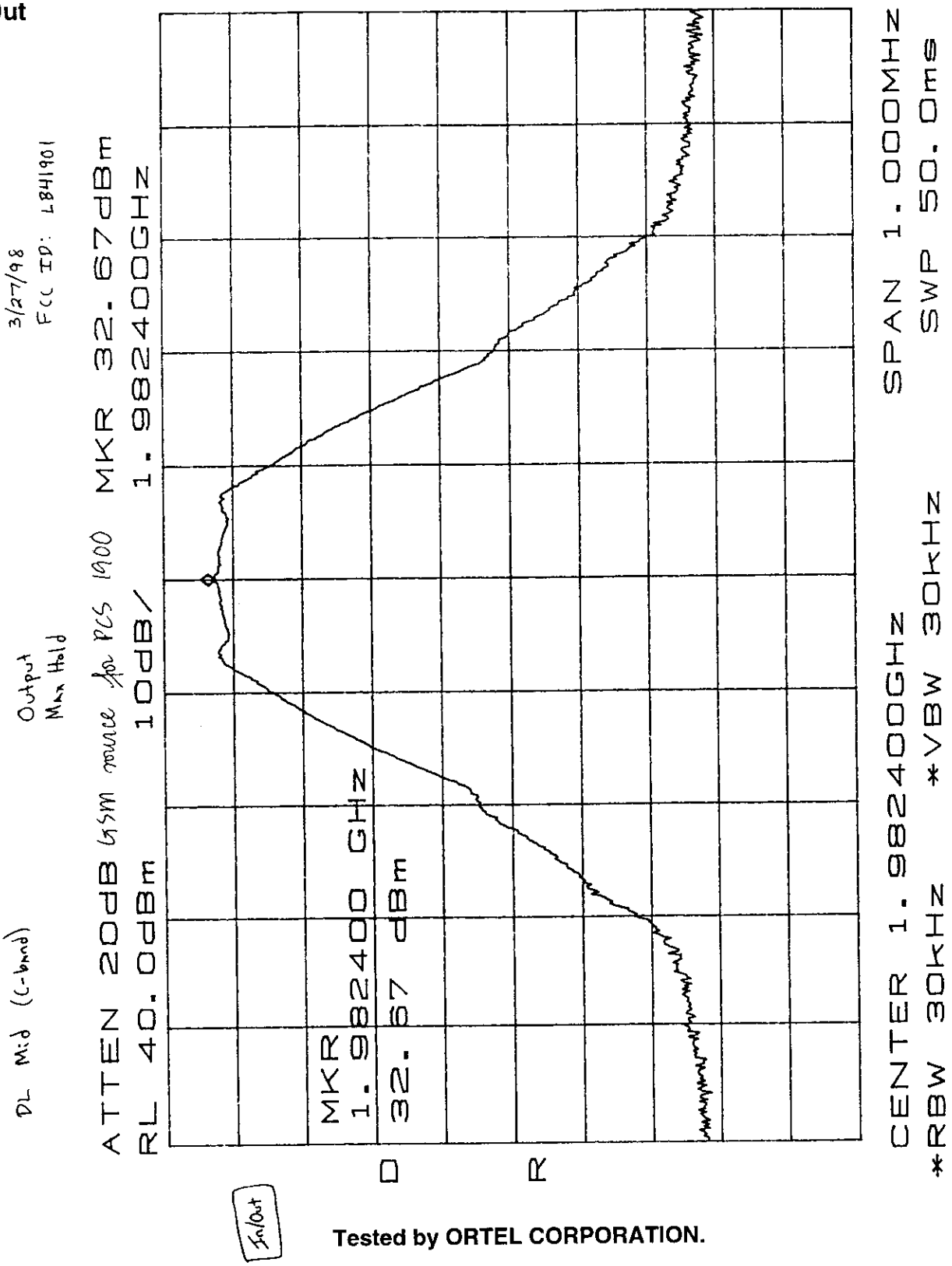

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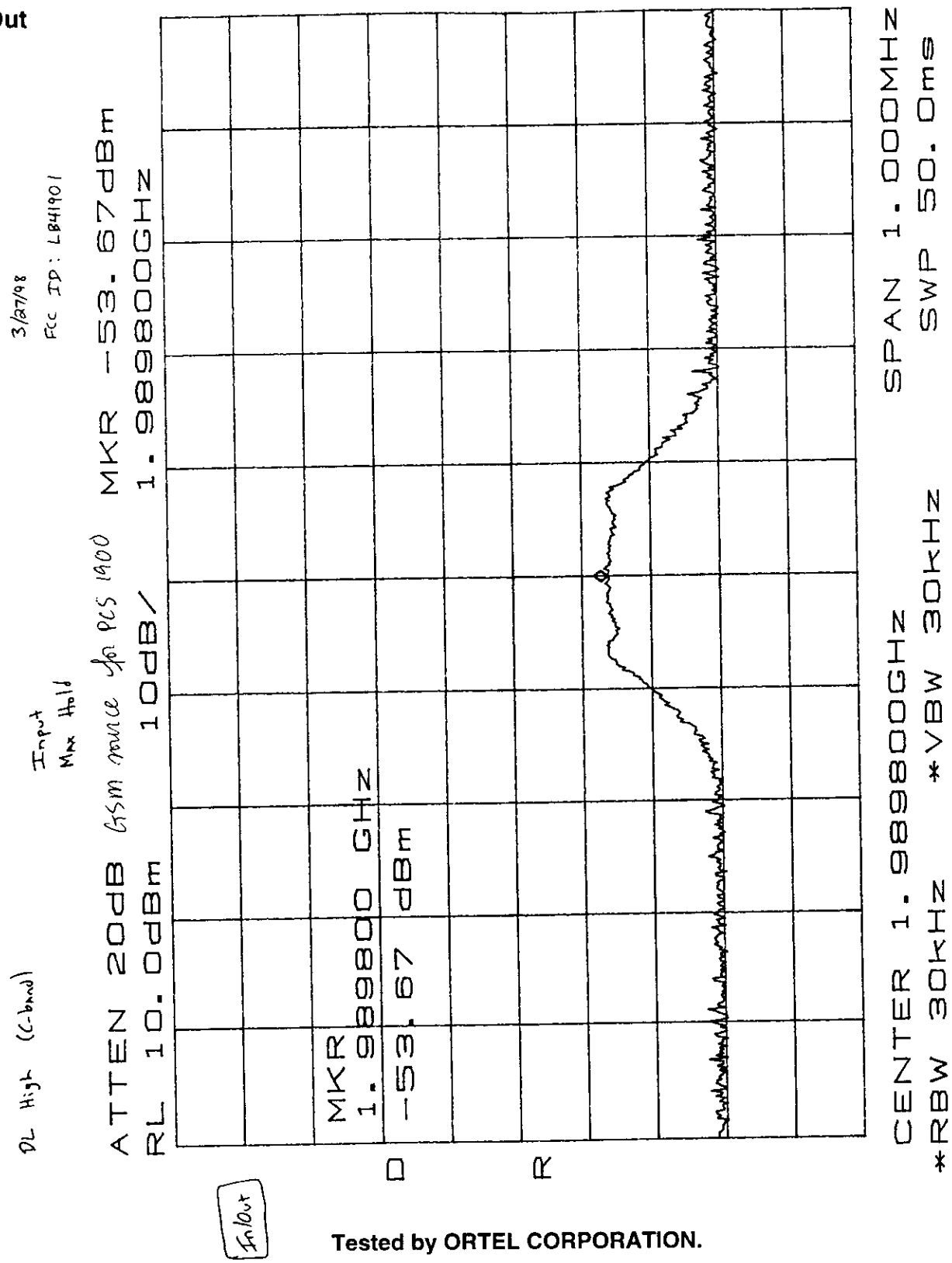

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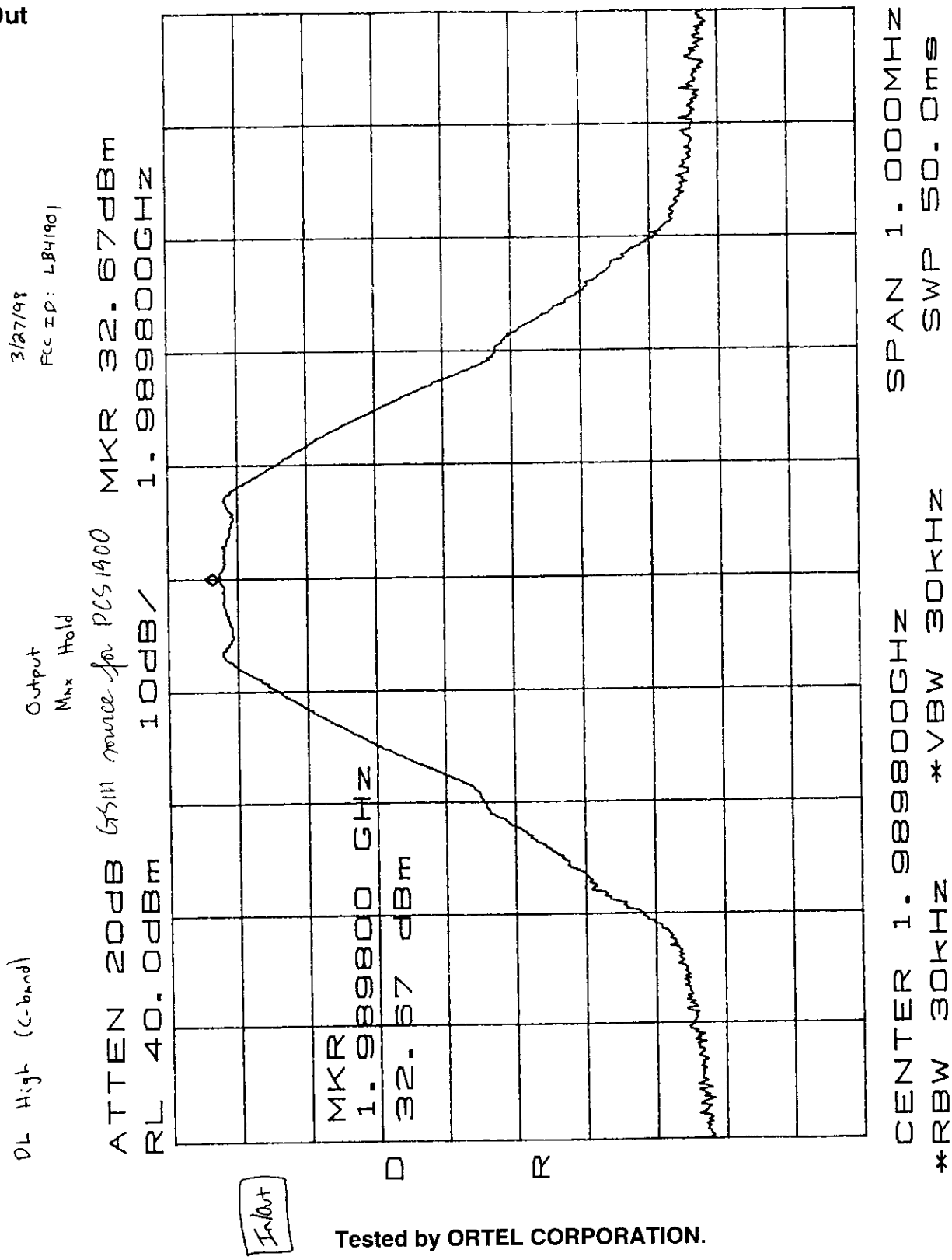

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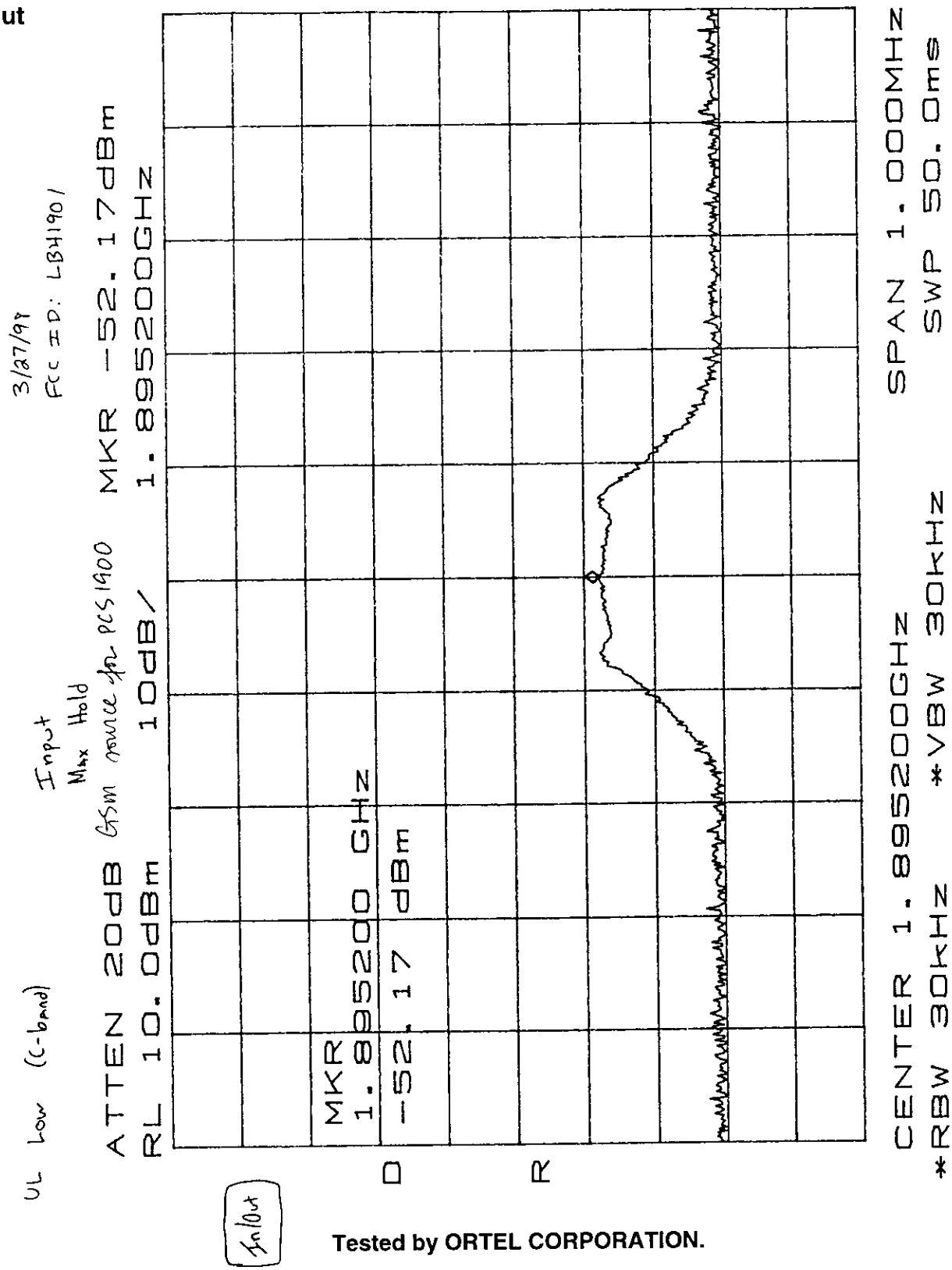

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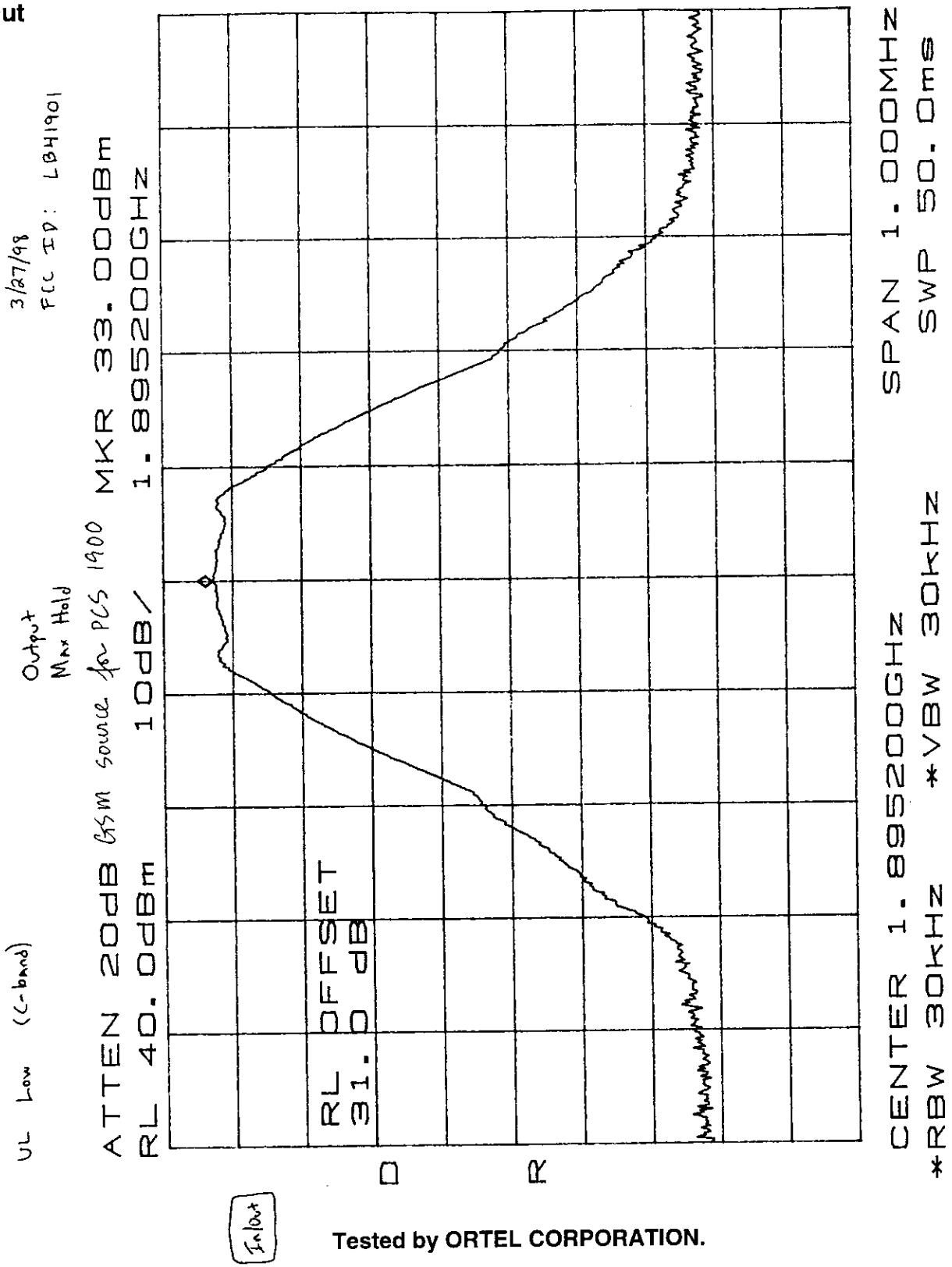

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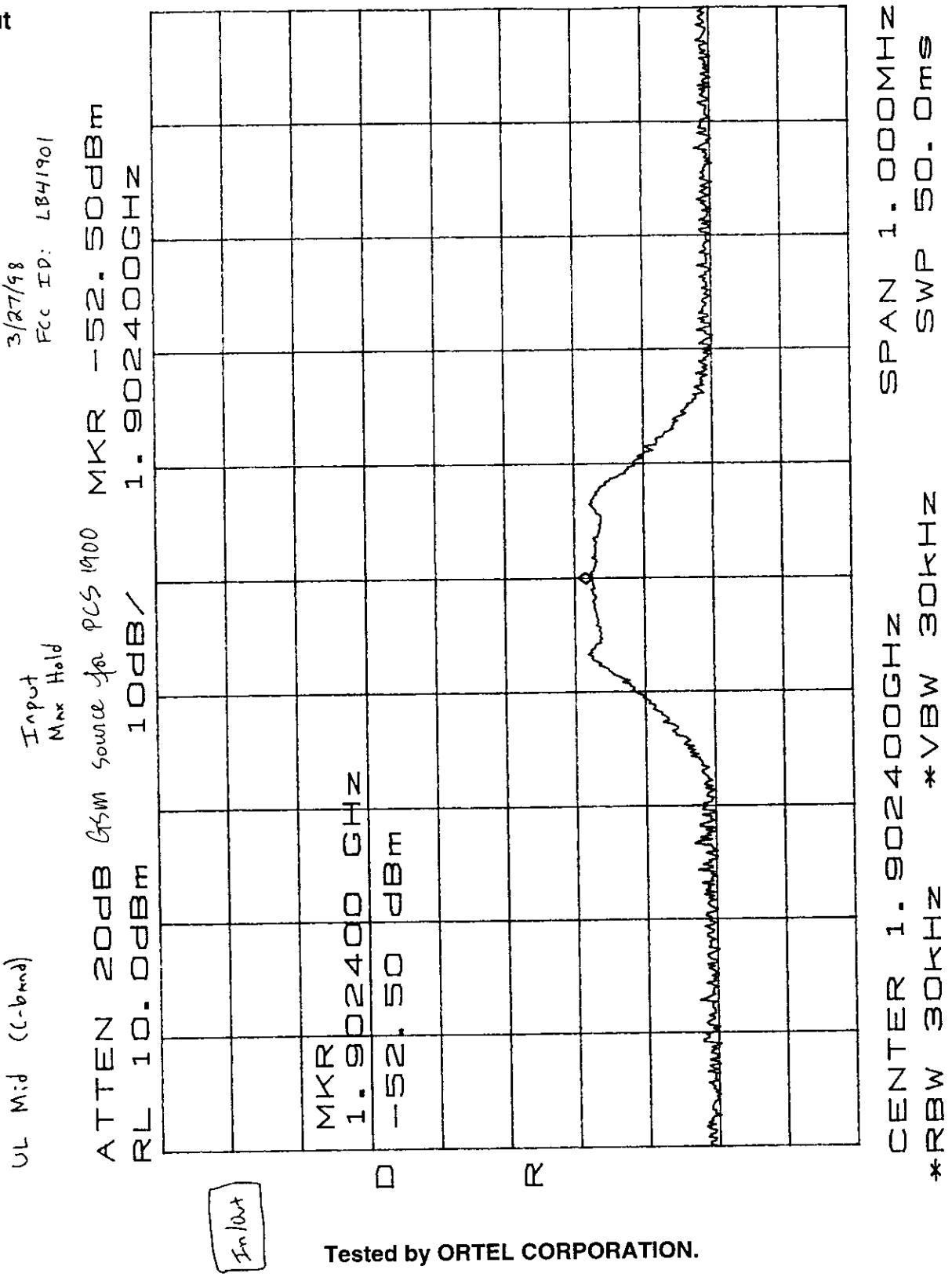

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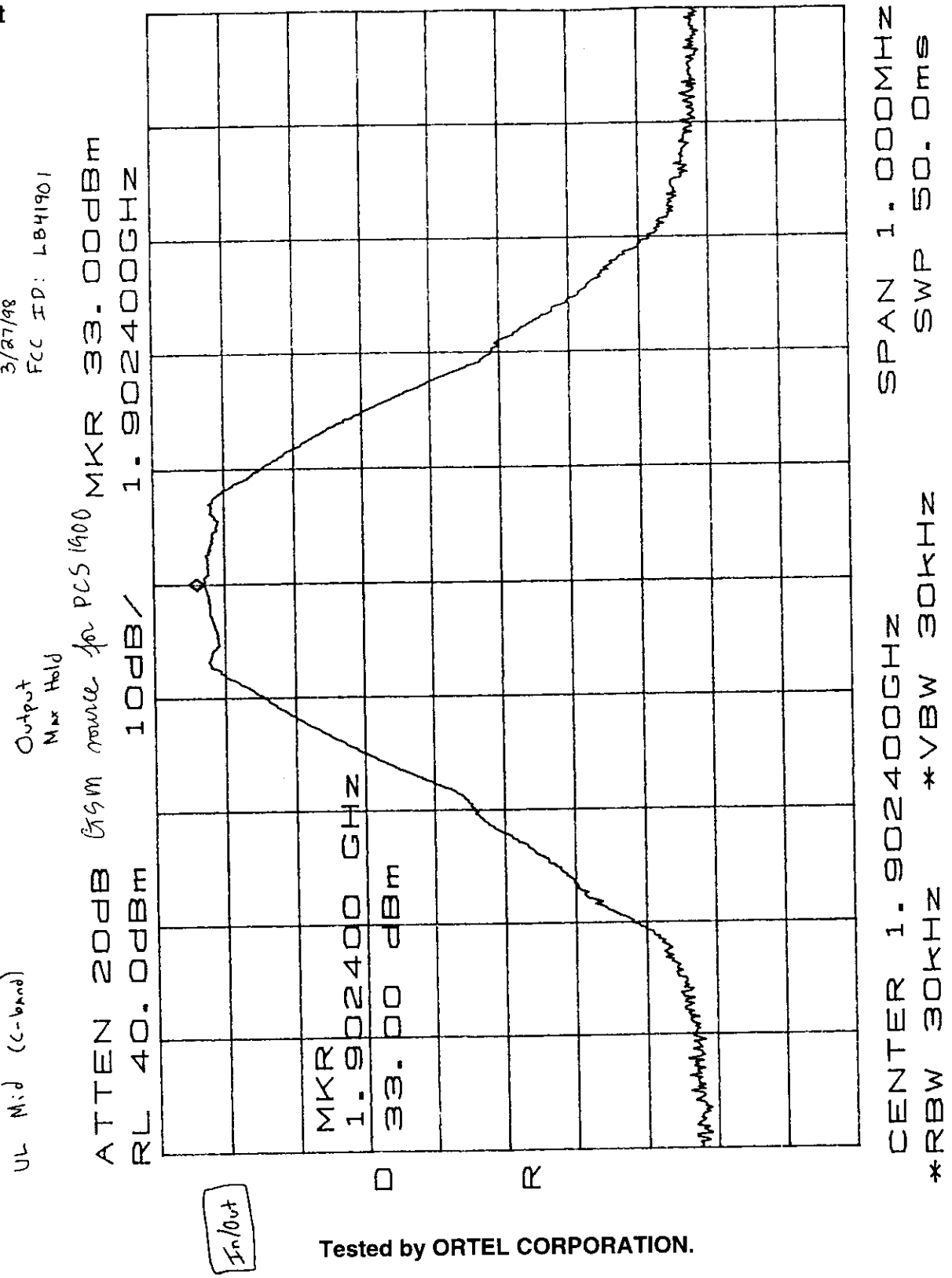

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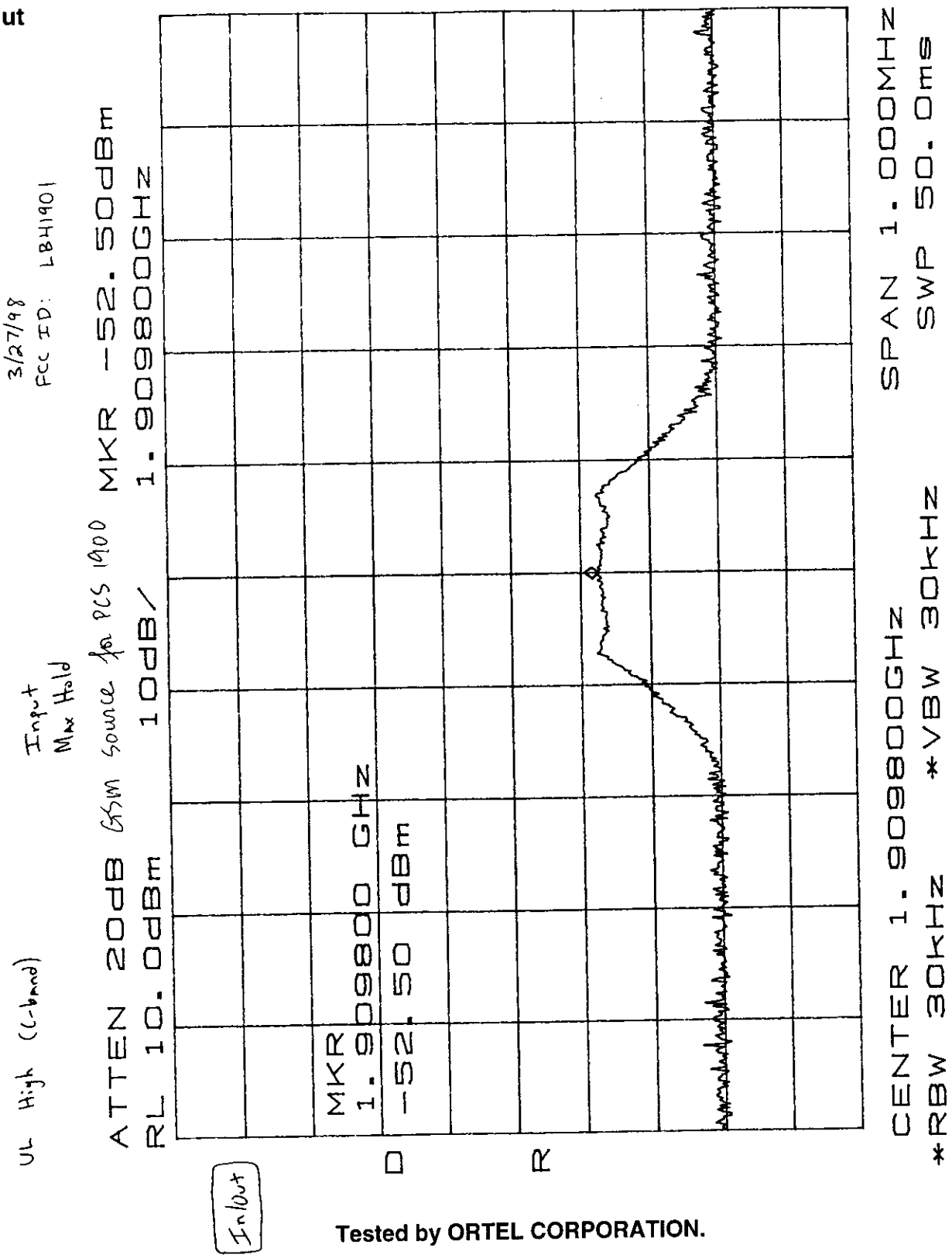

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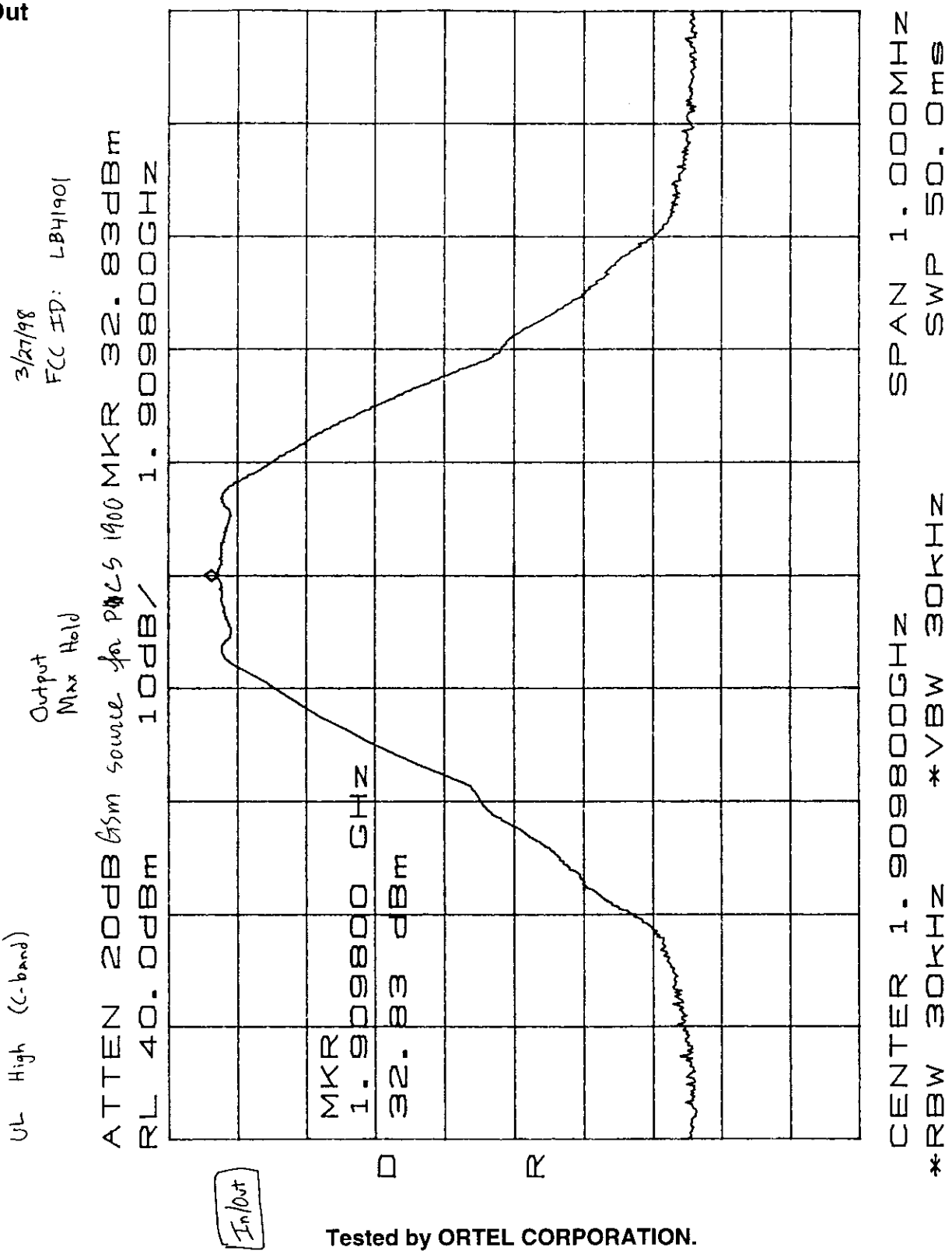

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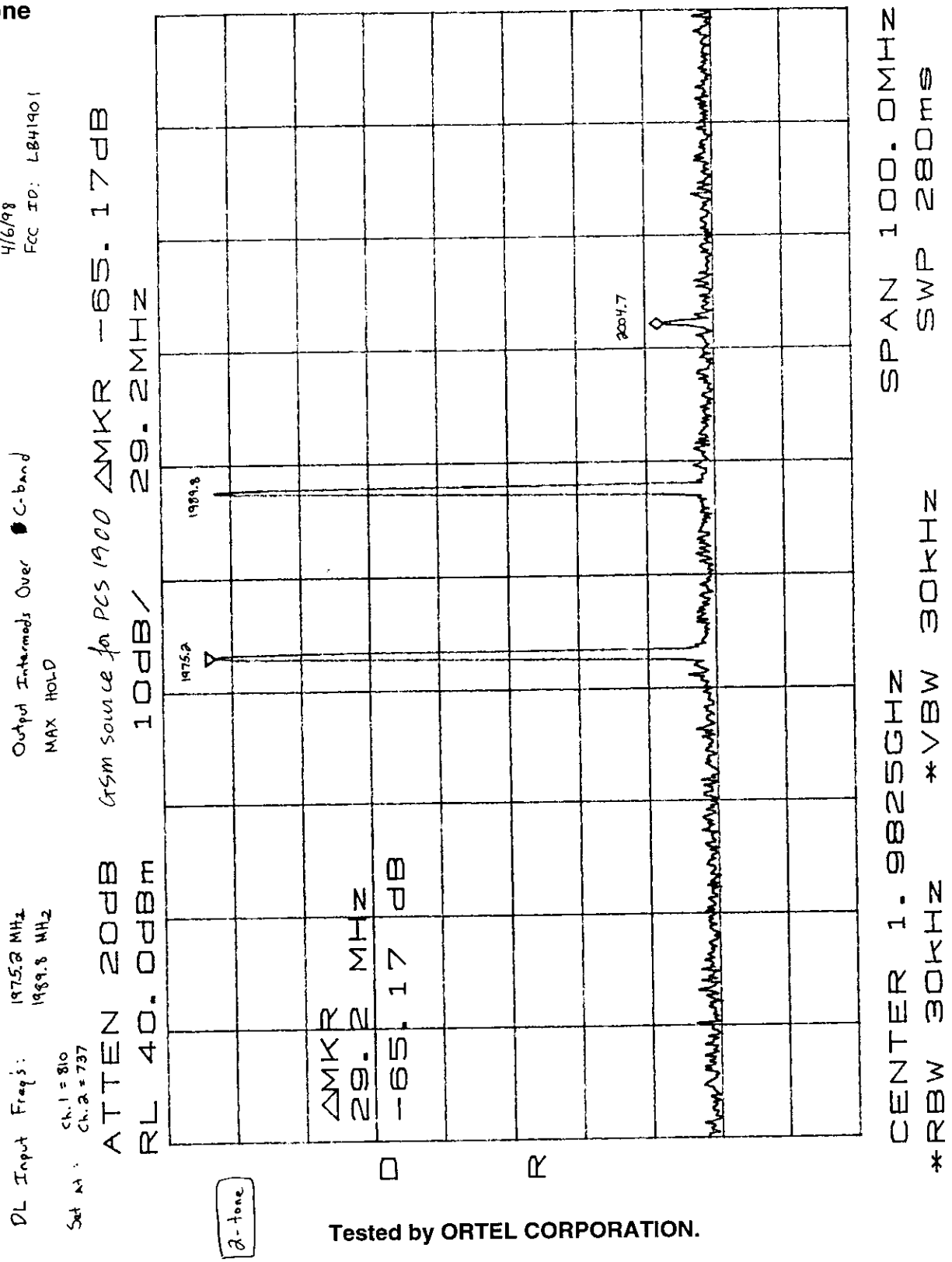
2-Tone



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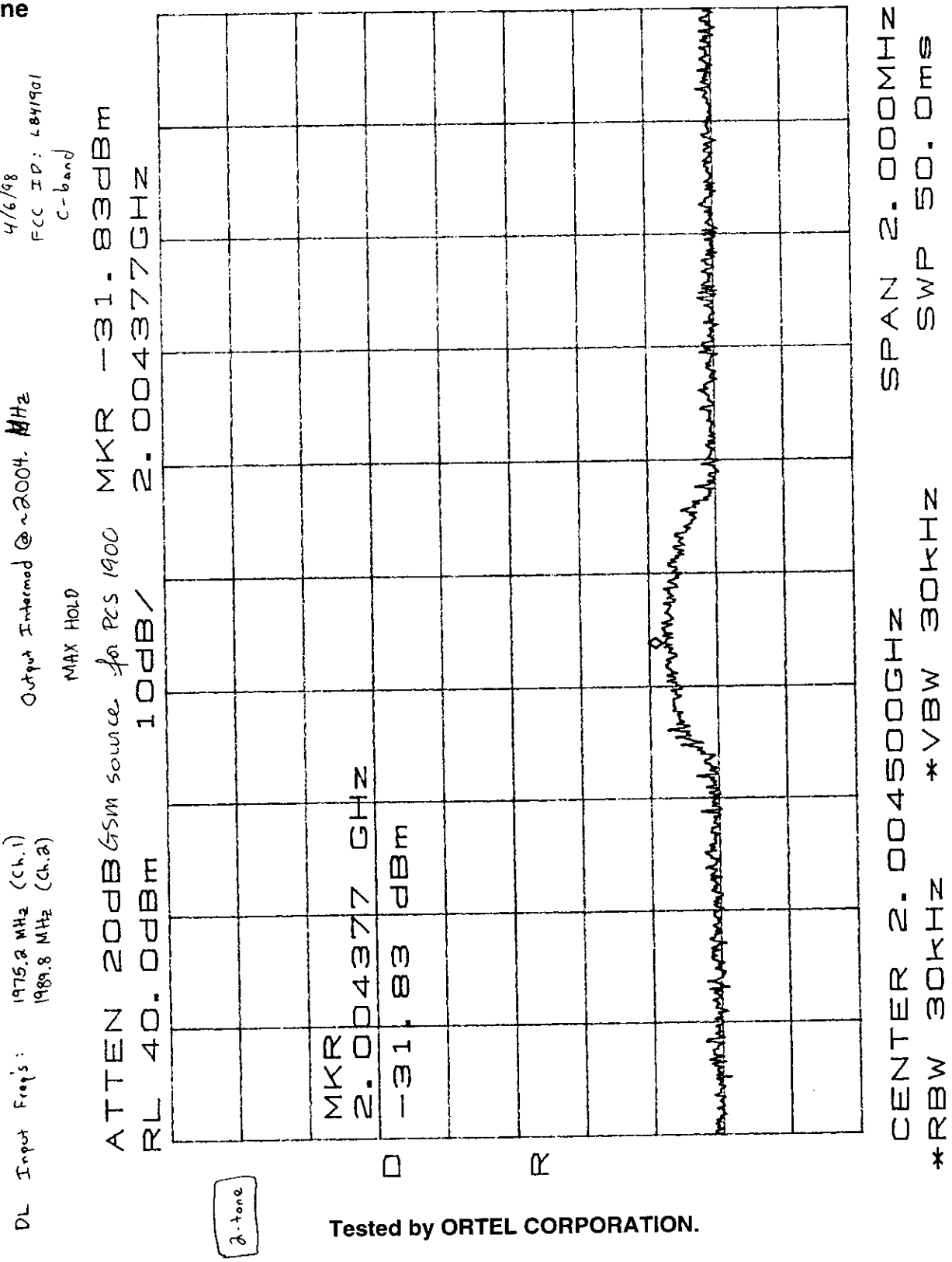

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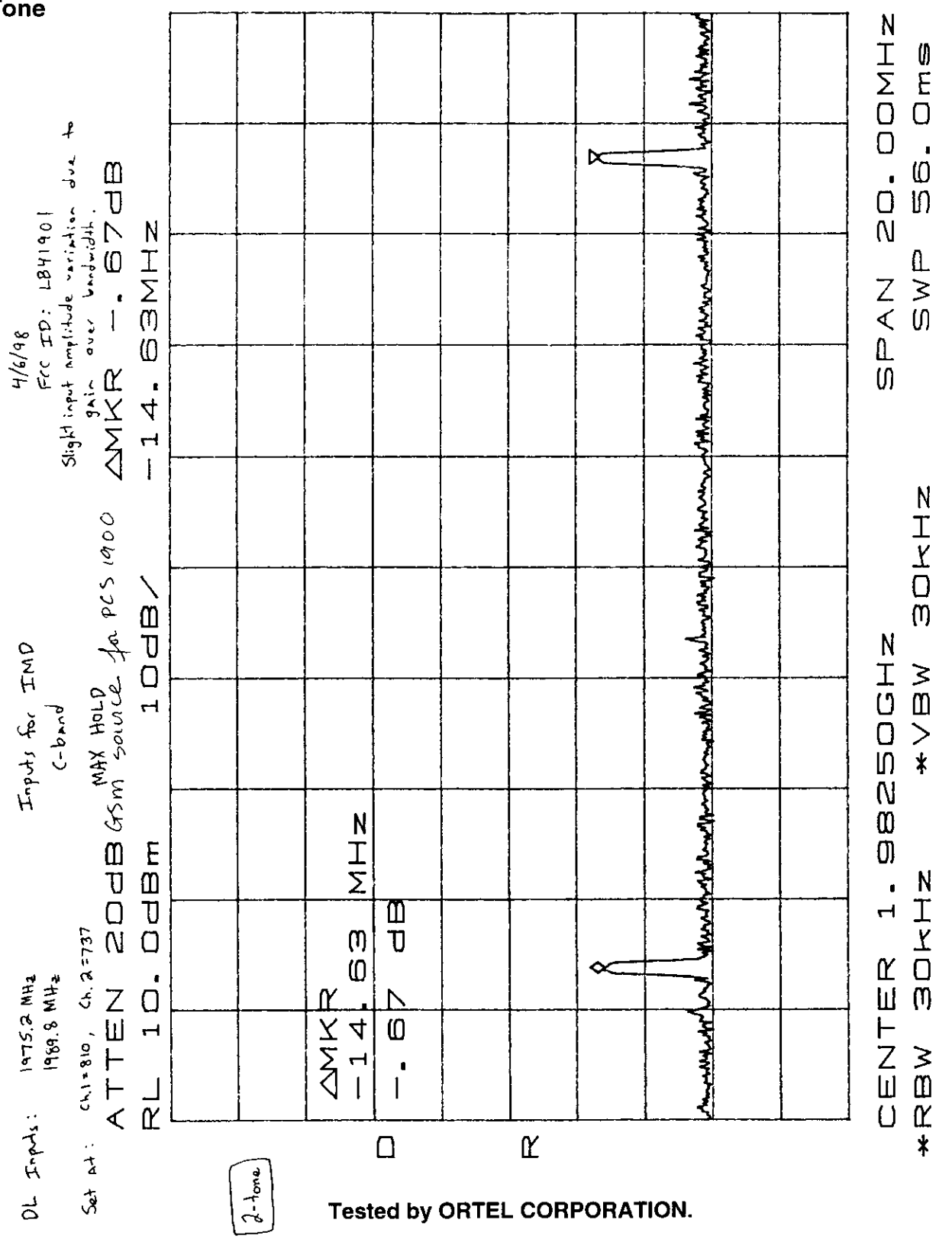

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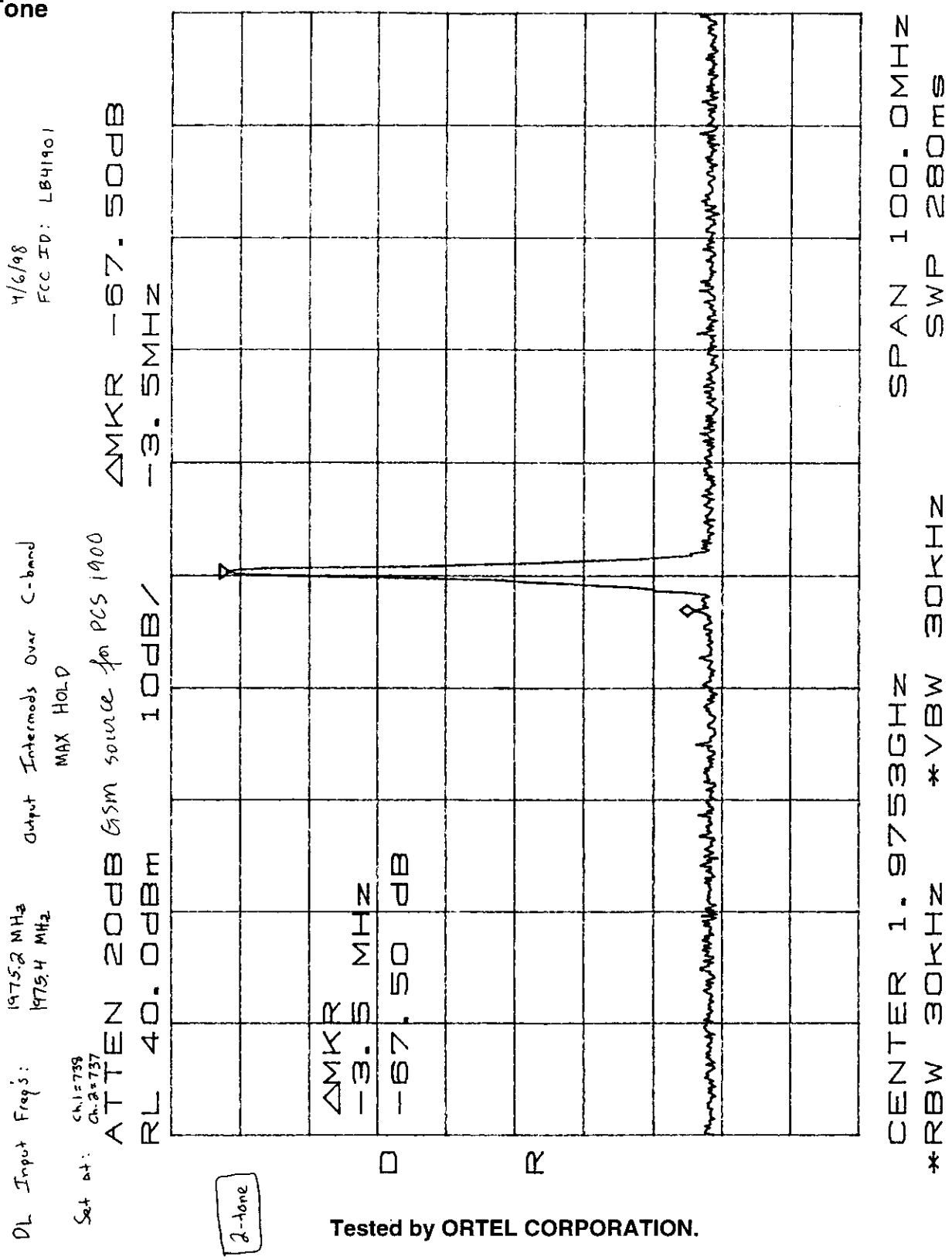

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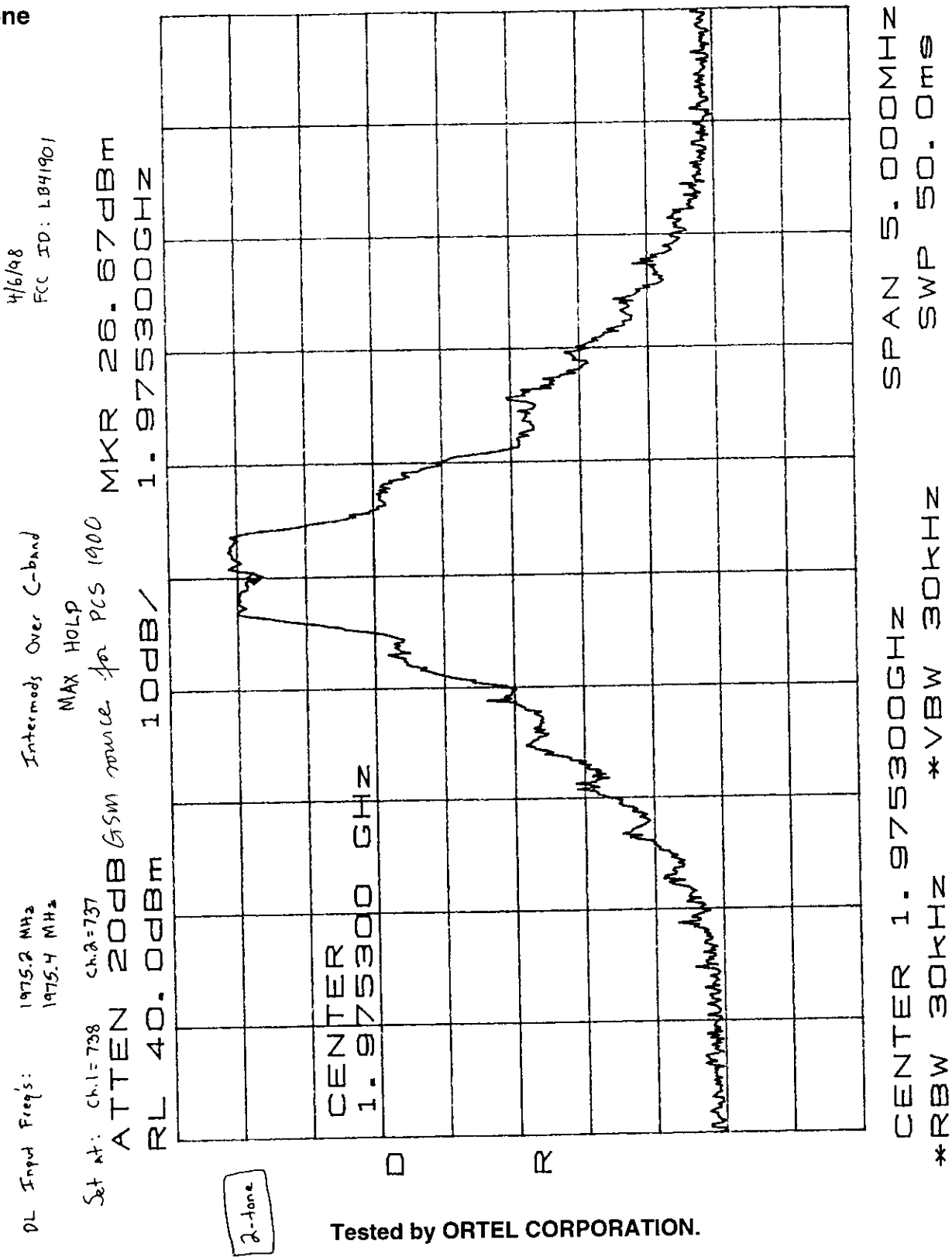

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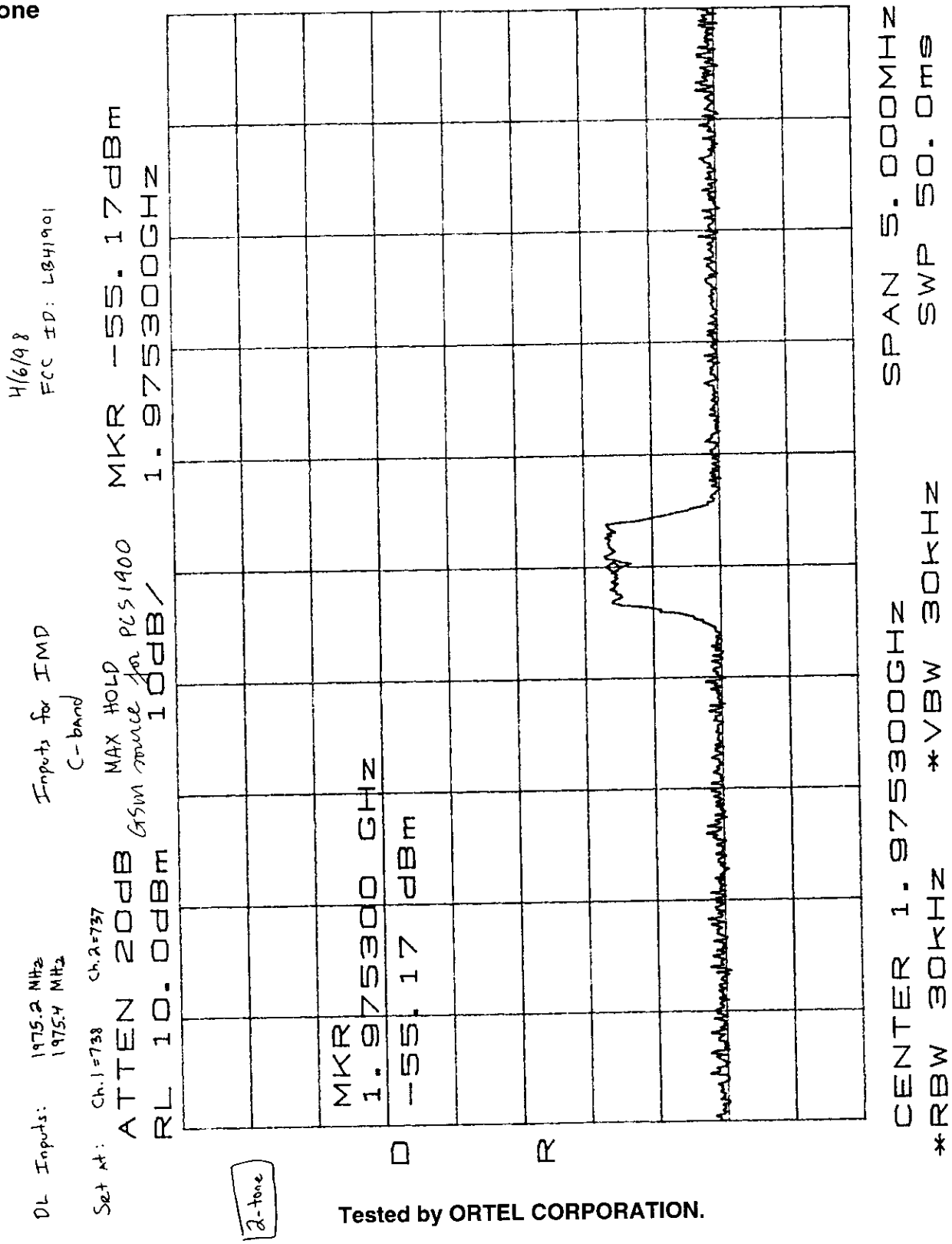

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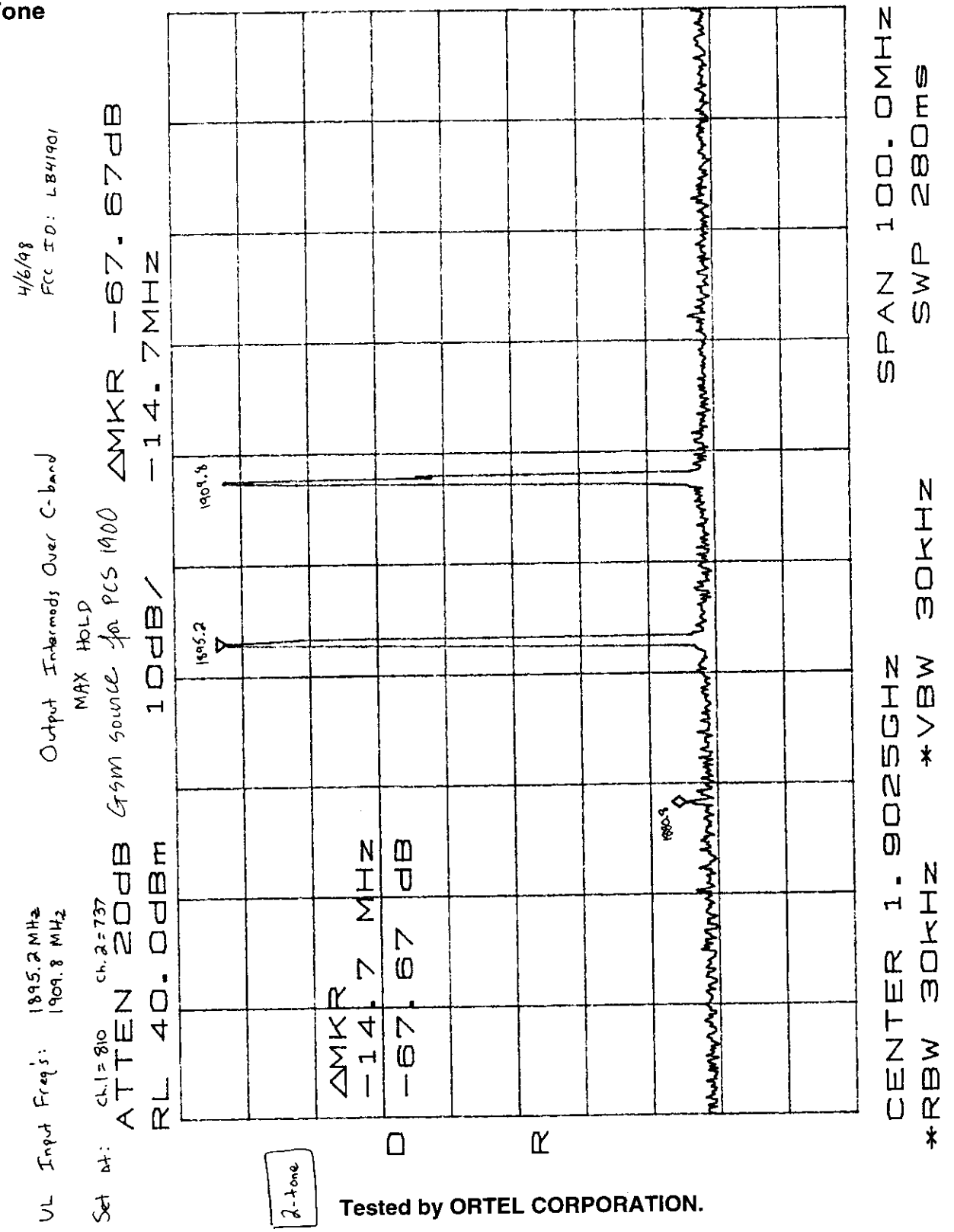

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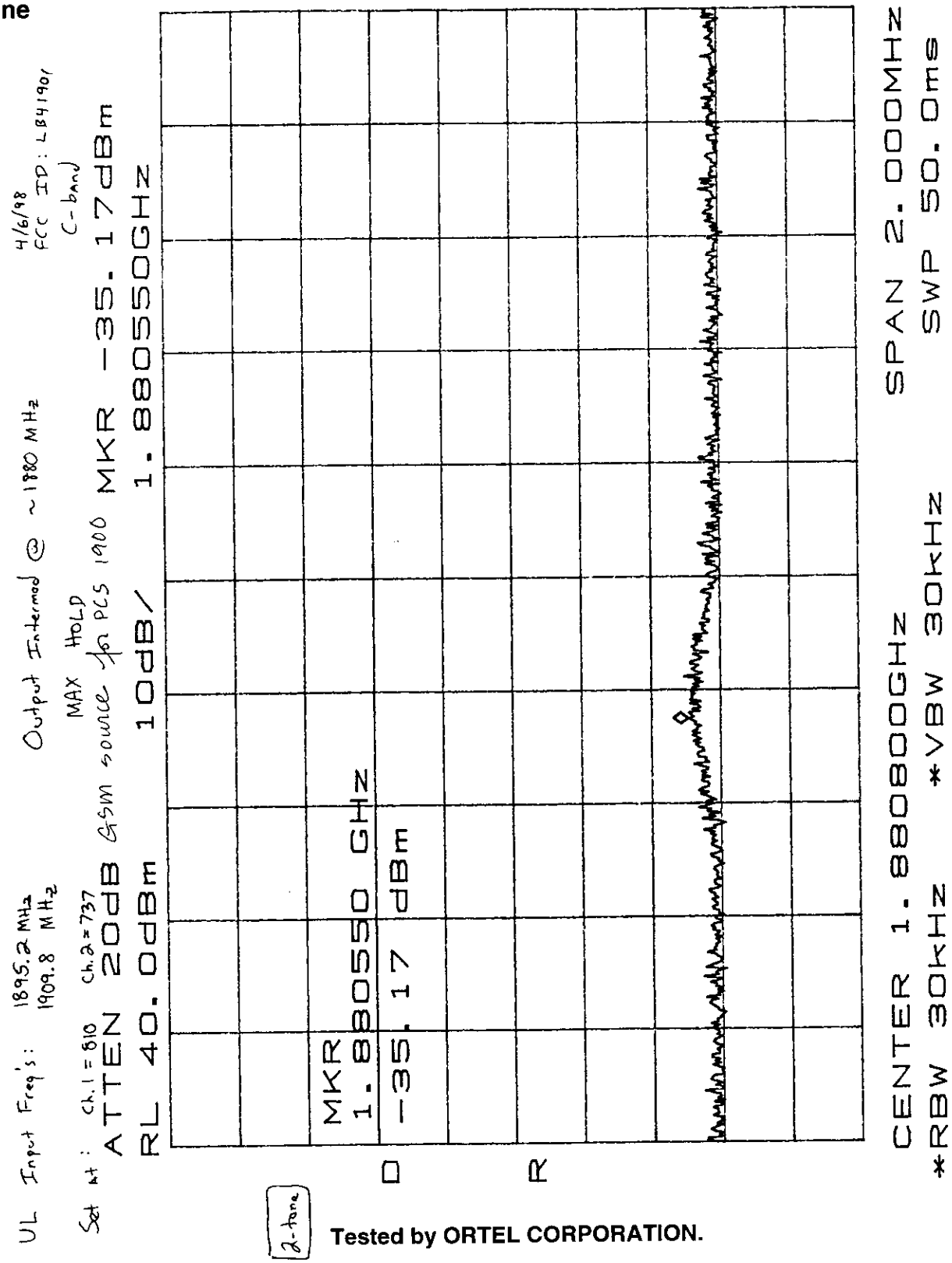

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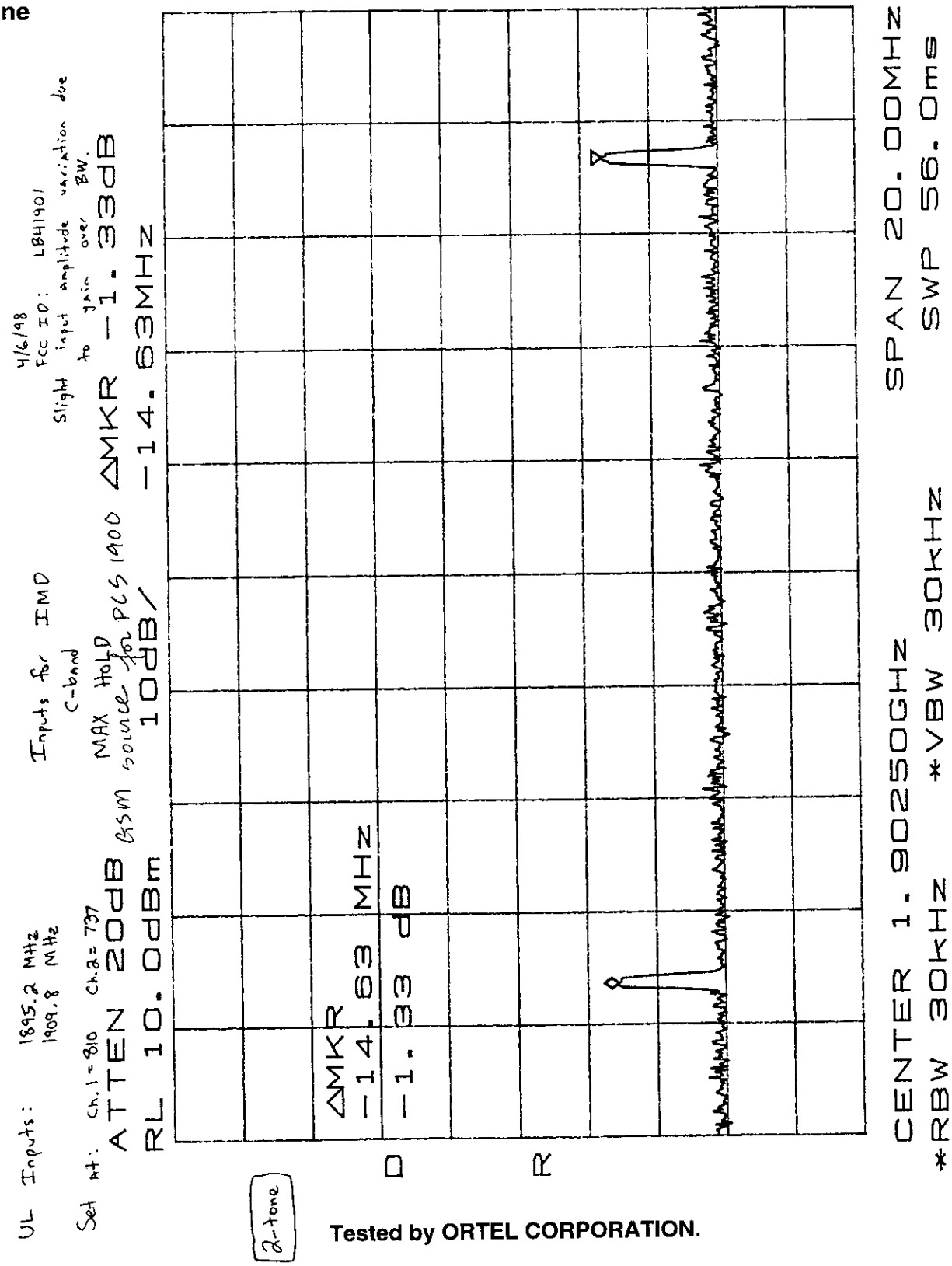
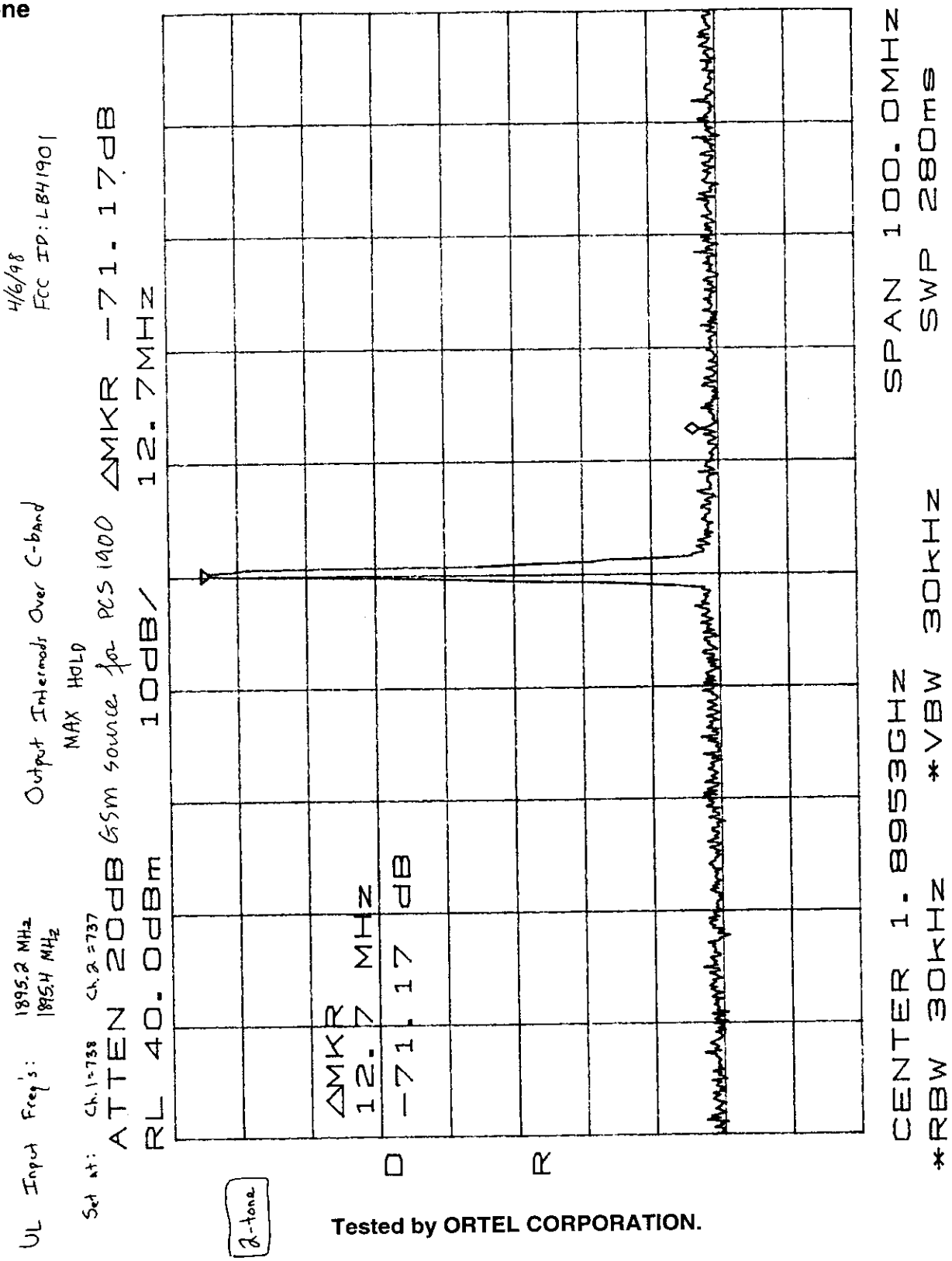
2-Tone



Tested by ORTEL CORPORATION.

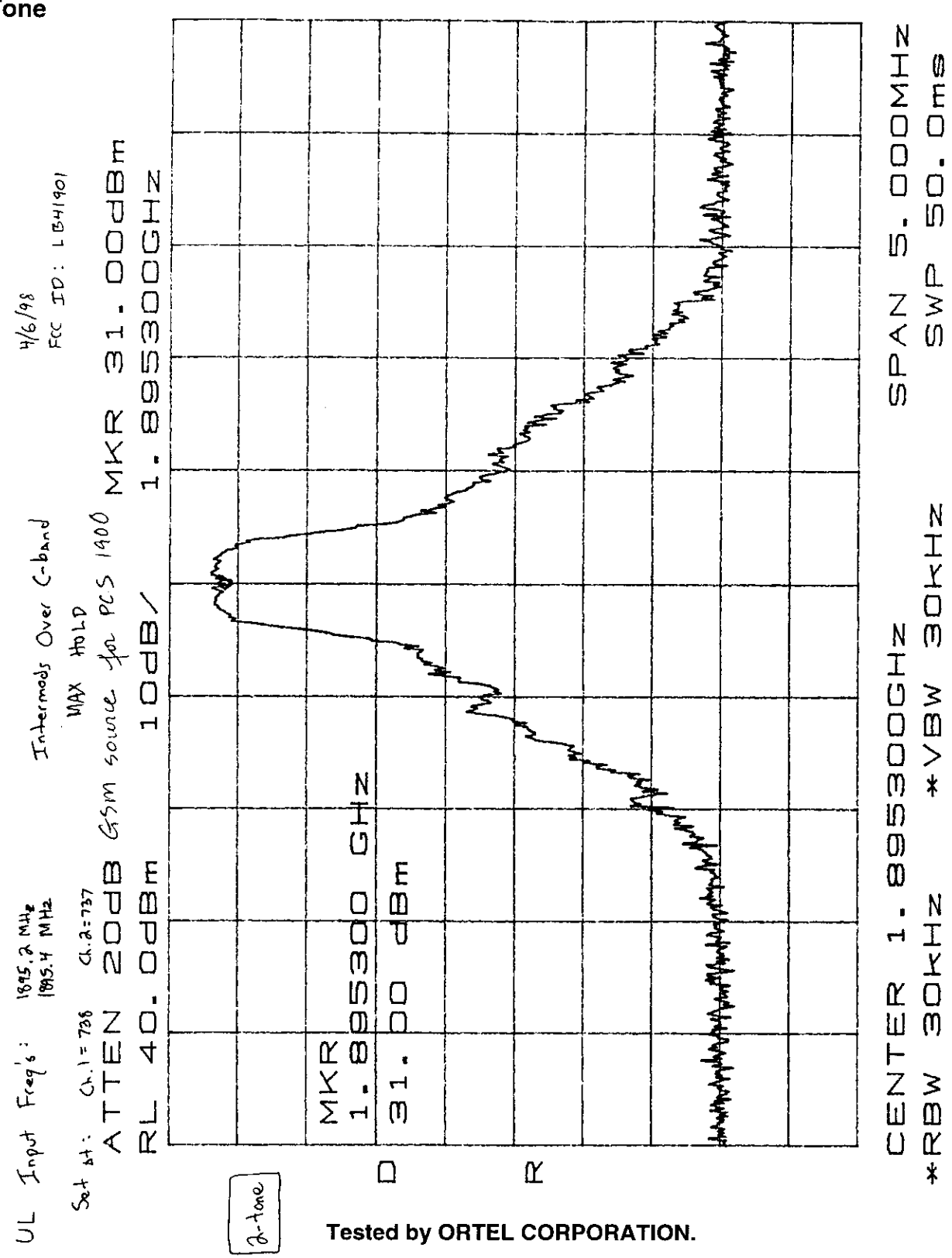
2-Tone



Tested by ORTEL CORPORATION.

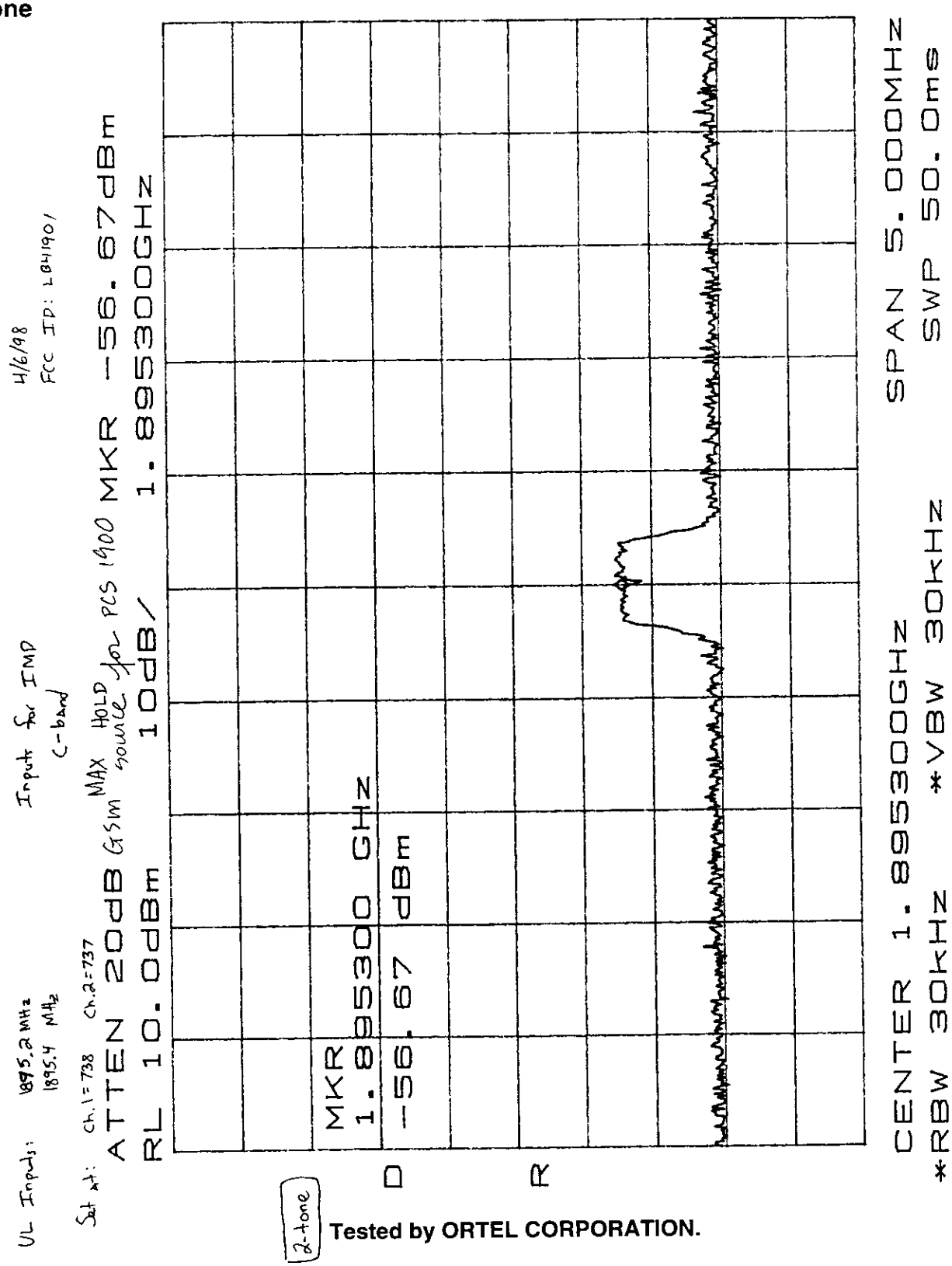
TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 619 546 3999 FAX 619 546 0364

2-Tone



Tested by ORTEL CORPORATION.

2-Tone



Tested by ORTEL CORPORATION.

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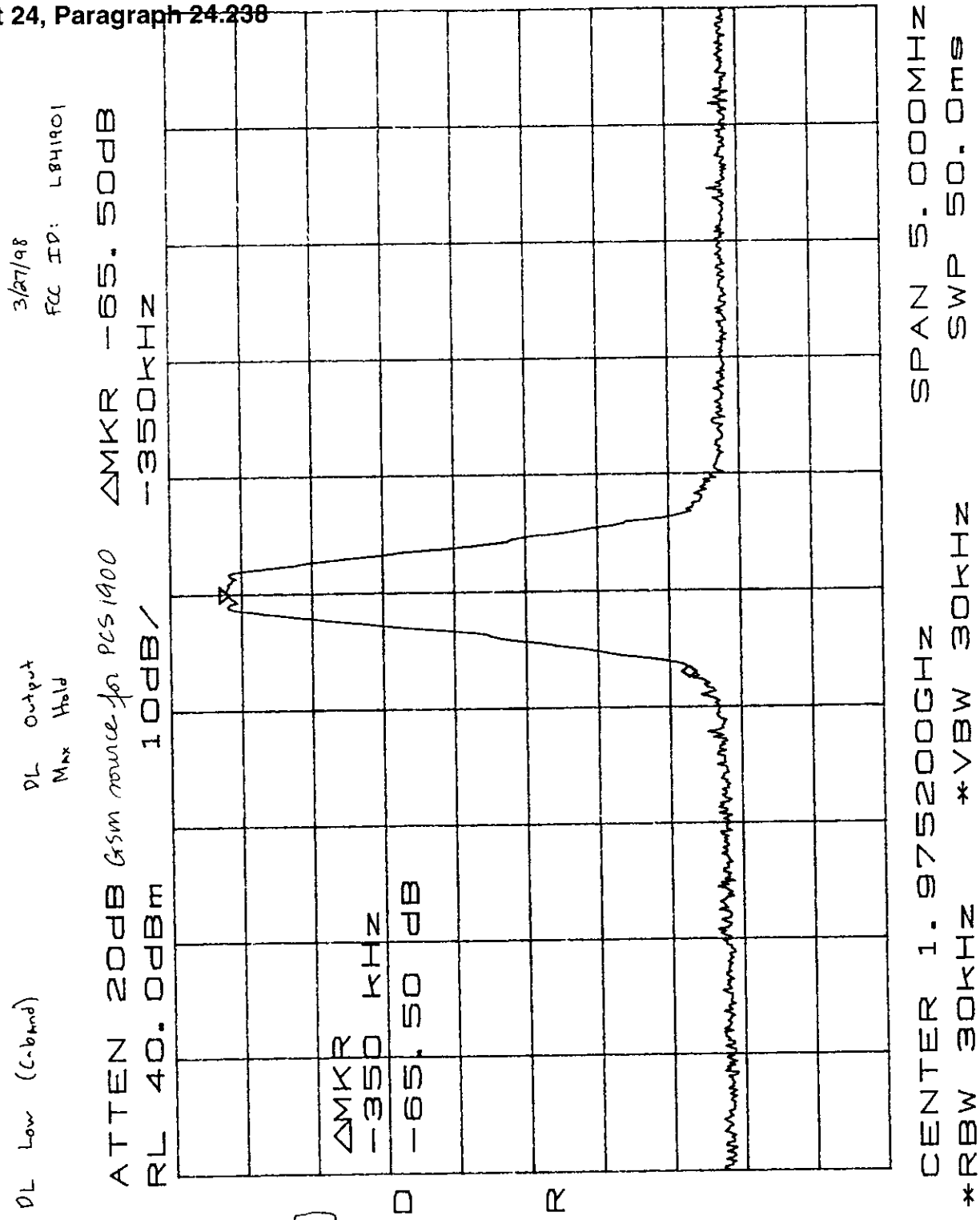
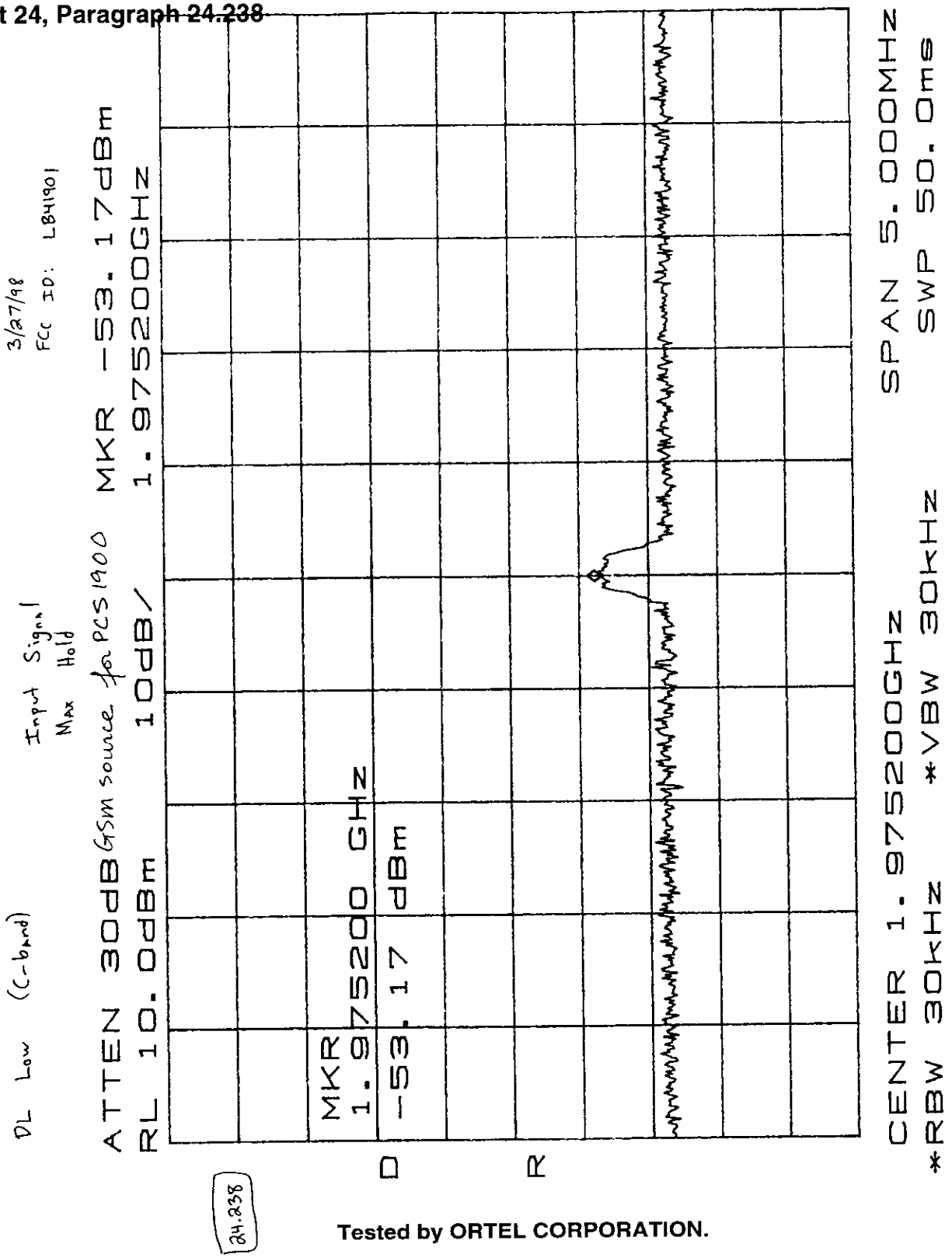
Part 24, Paragraph ~~24.238~~



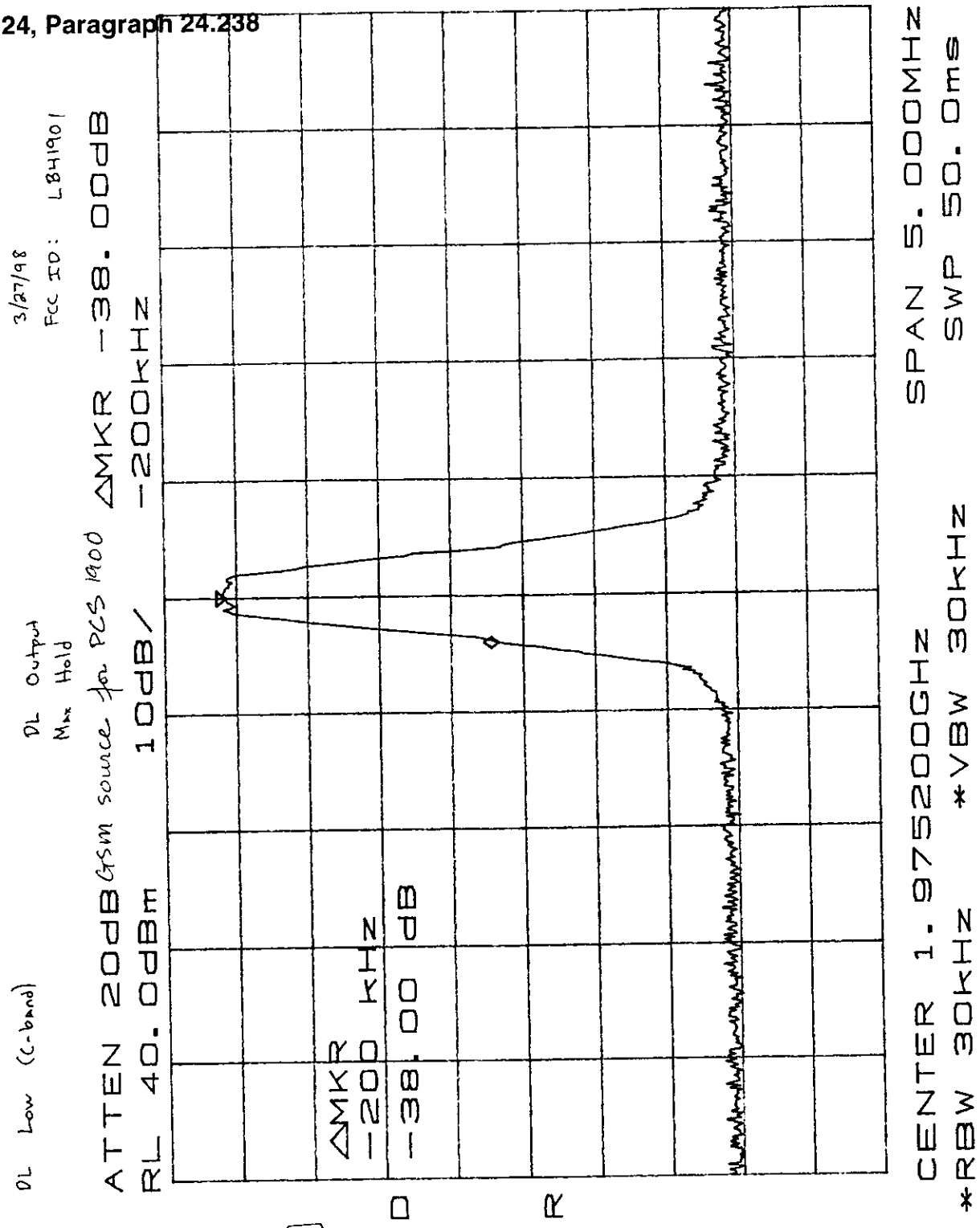
Tested by ORTEL CORPORATION.

Part 24, Paragraph ~~24.238~~



Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



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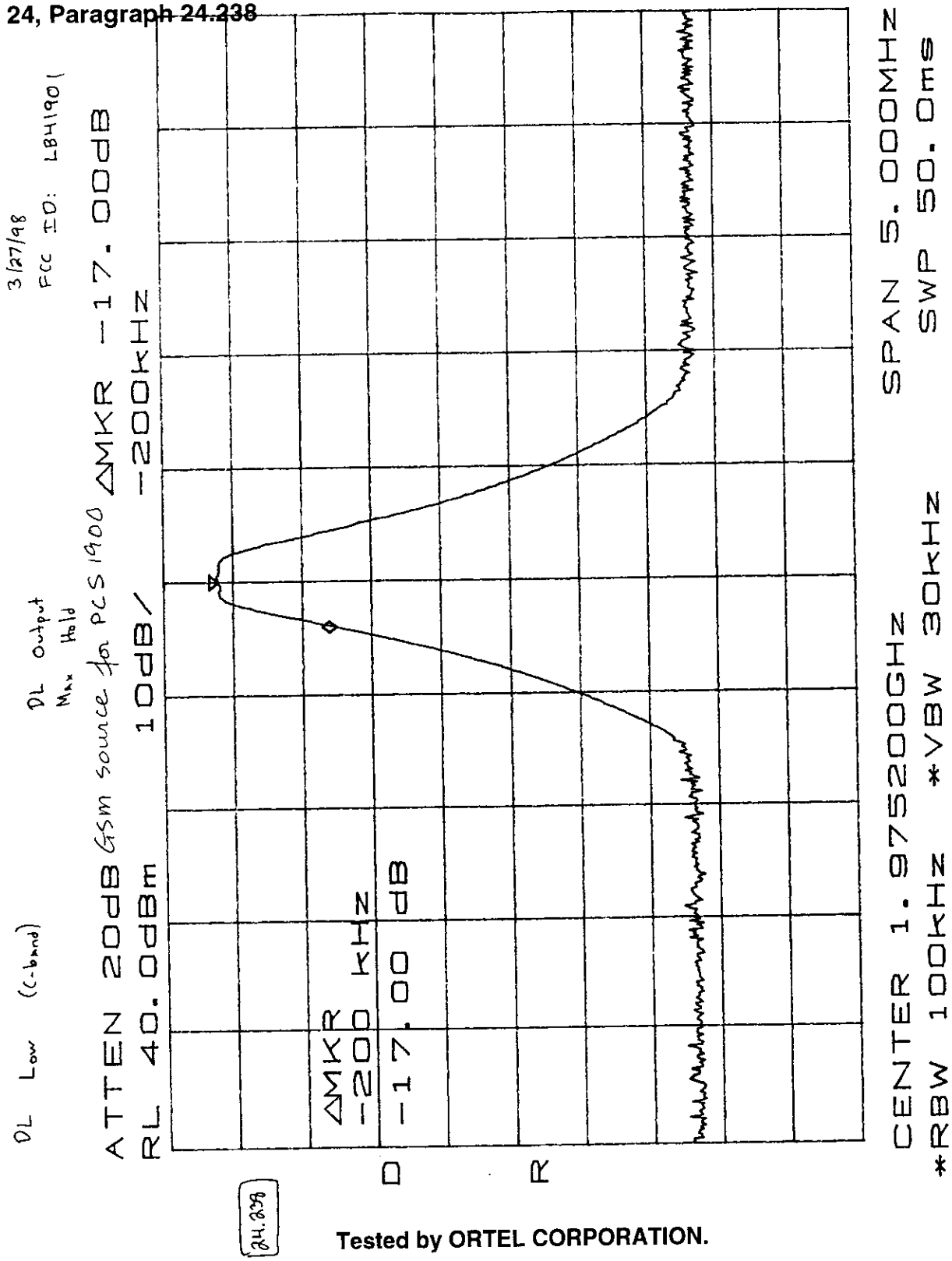
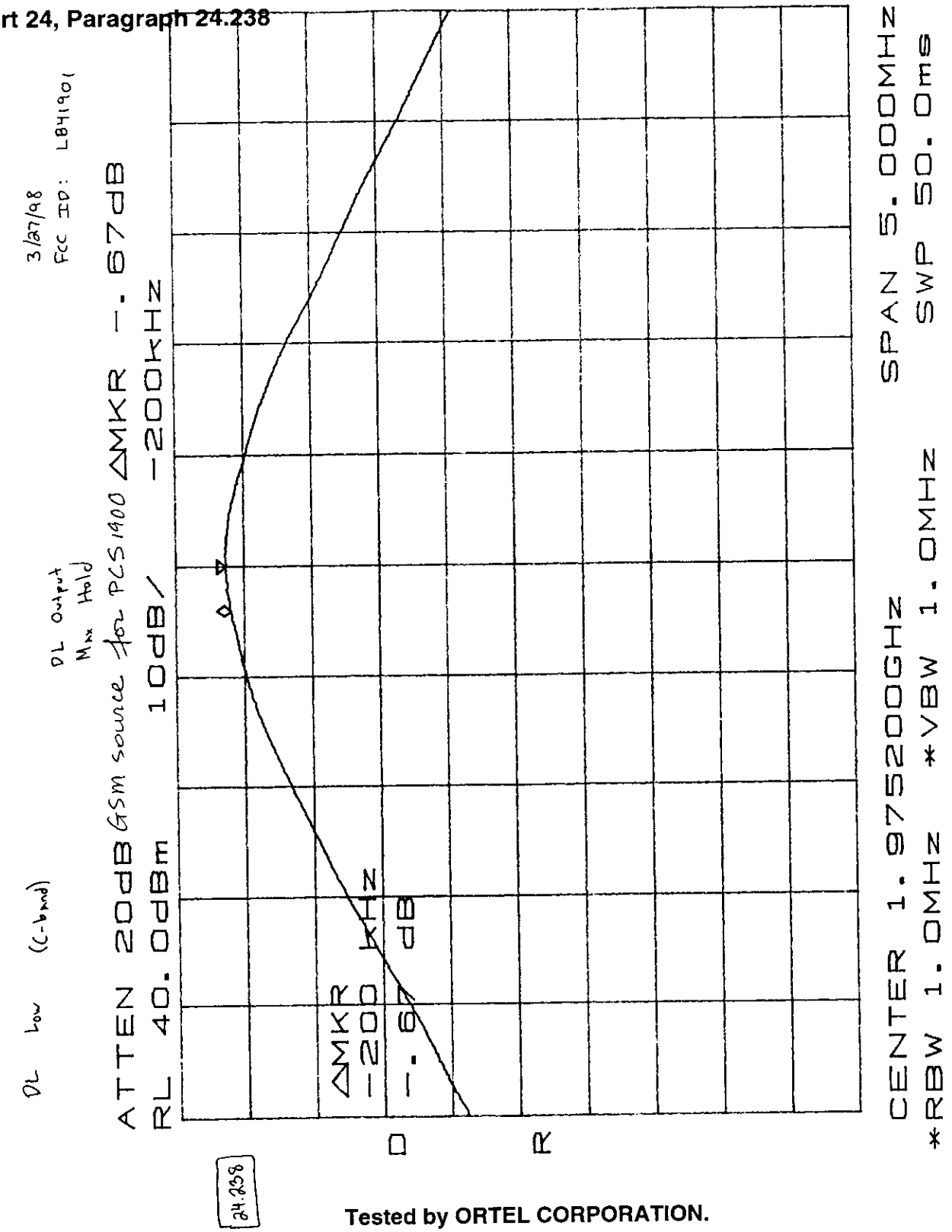
Part 24, Paragraph 24.238



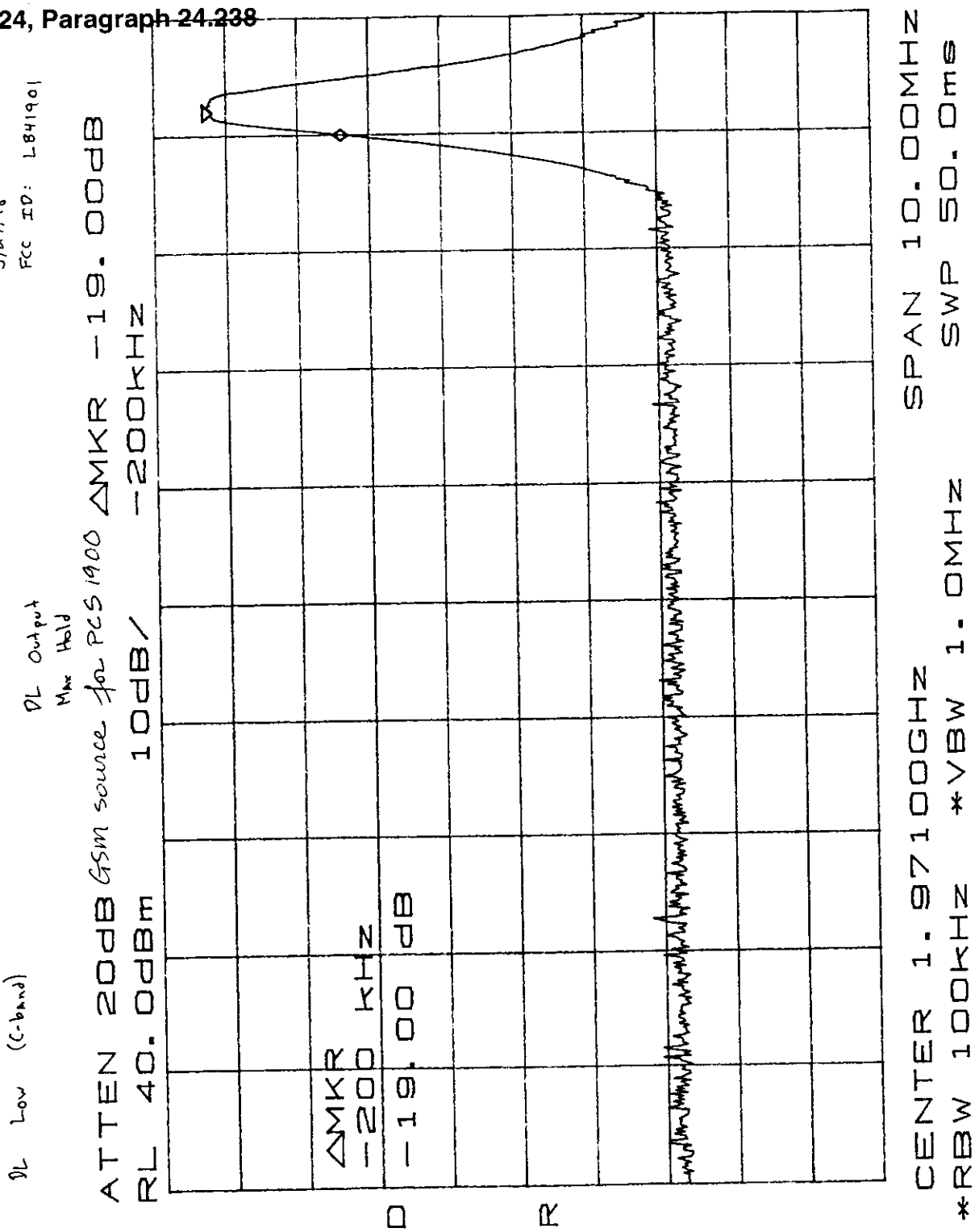
Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



Tested by ORTEL CORPORATION.

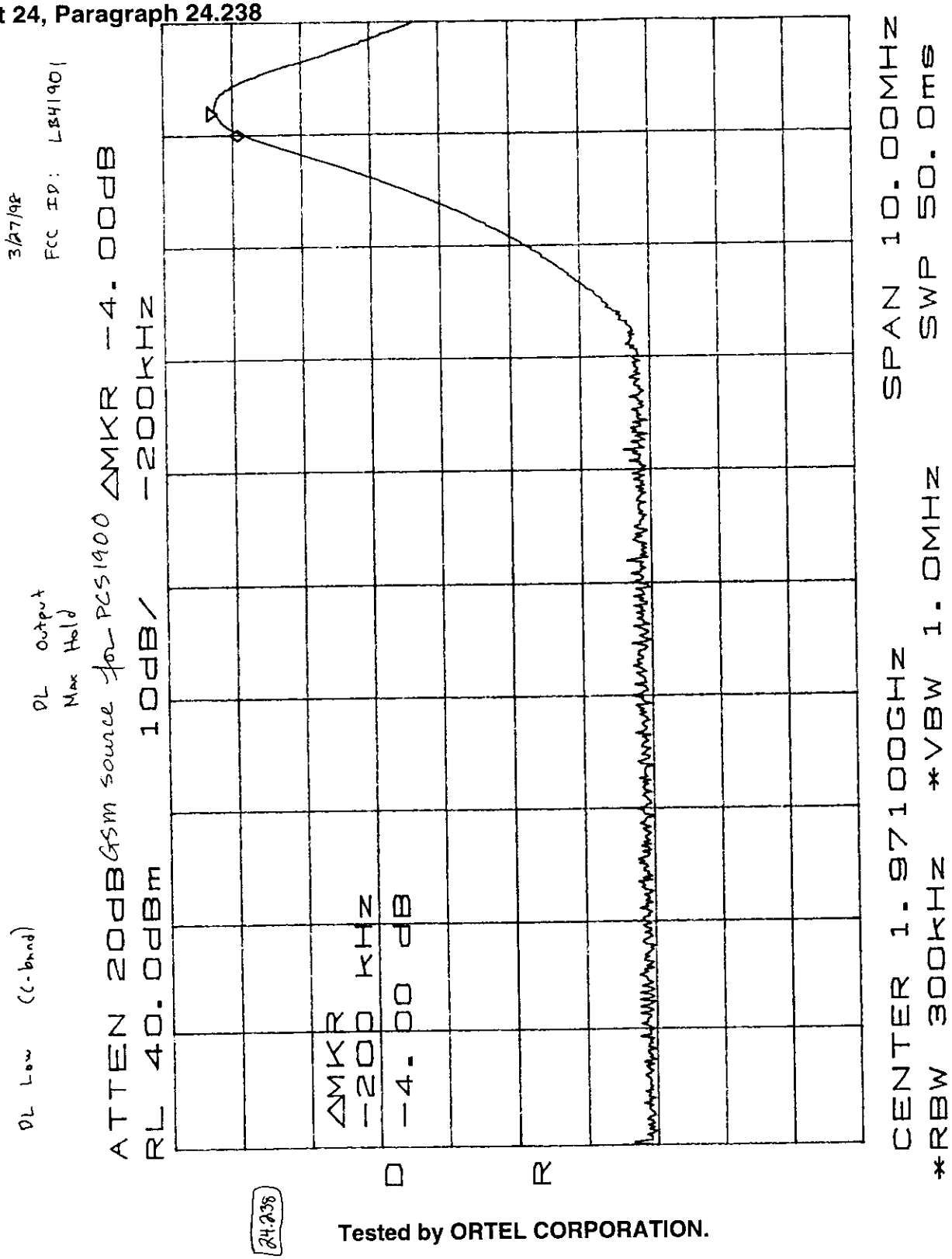
Part 24, Paragraph ~~24.238~~



24.238

Tested by ORTEL CORPORATION.

Part 24, Paragraph 24.238



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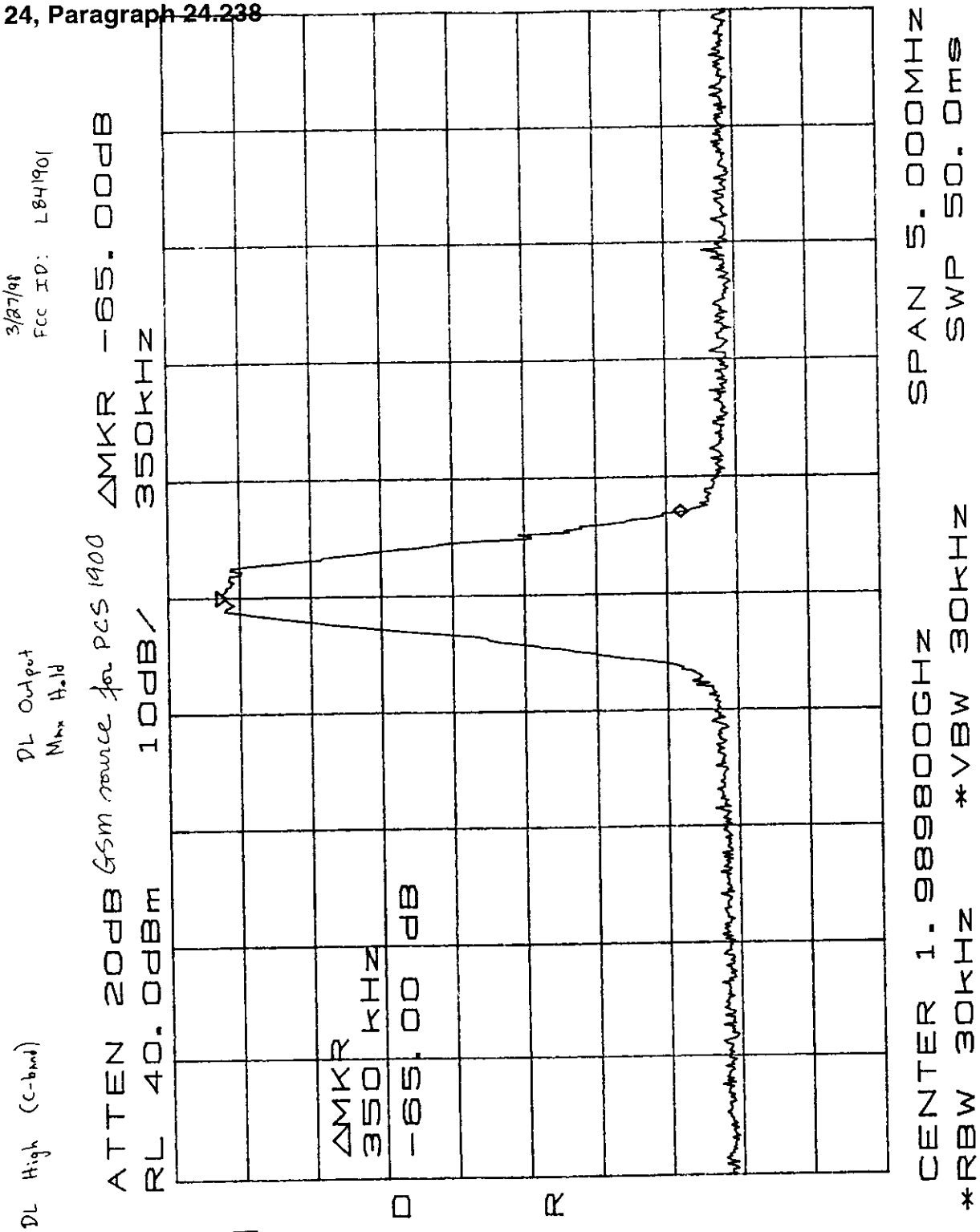
Part 24, Paragraph ~~24.238~~



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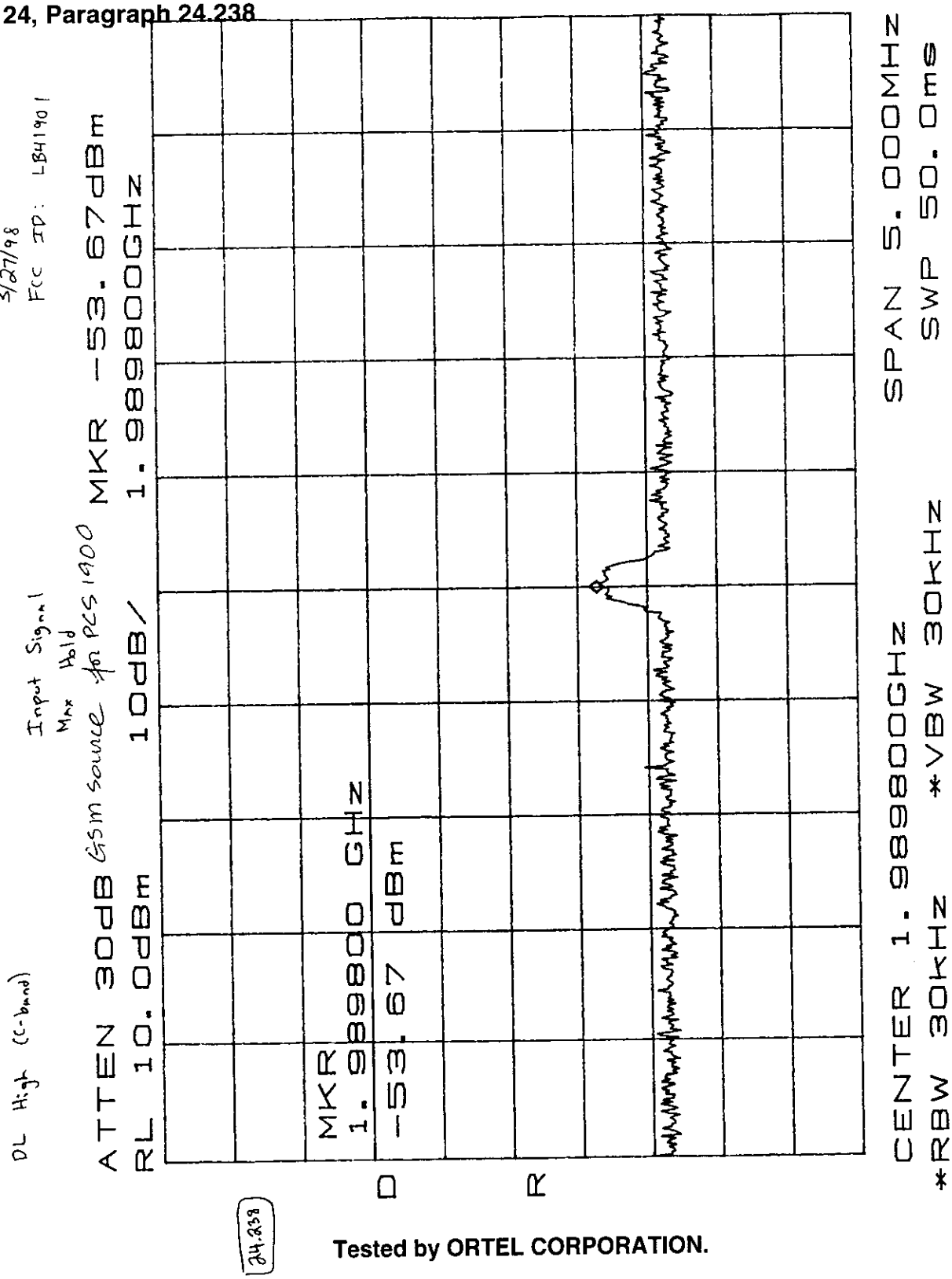
Part 24, Paragraph 24.238



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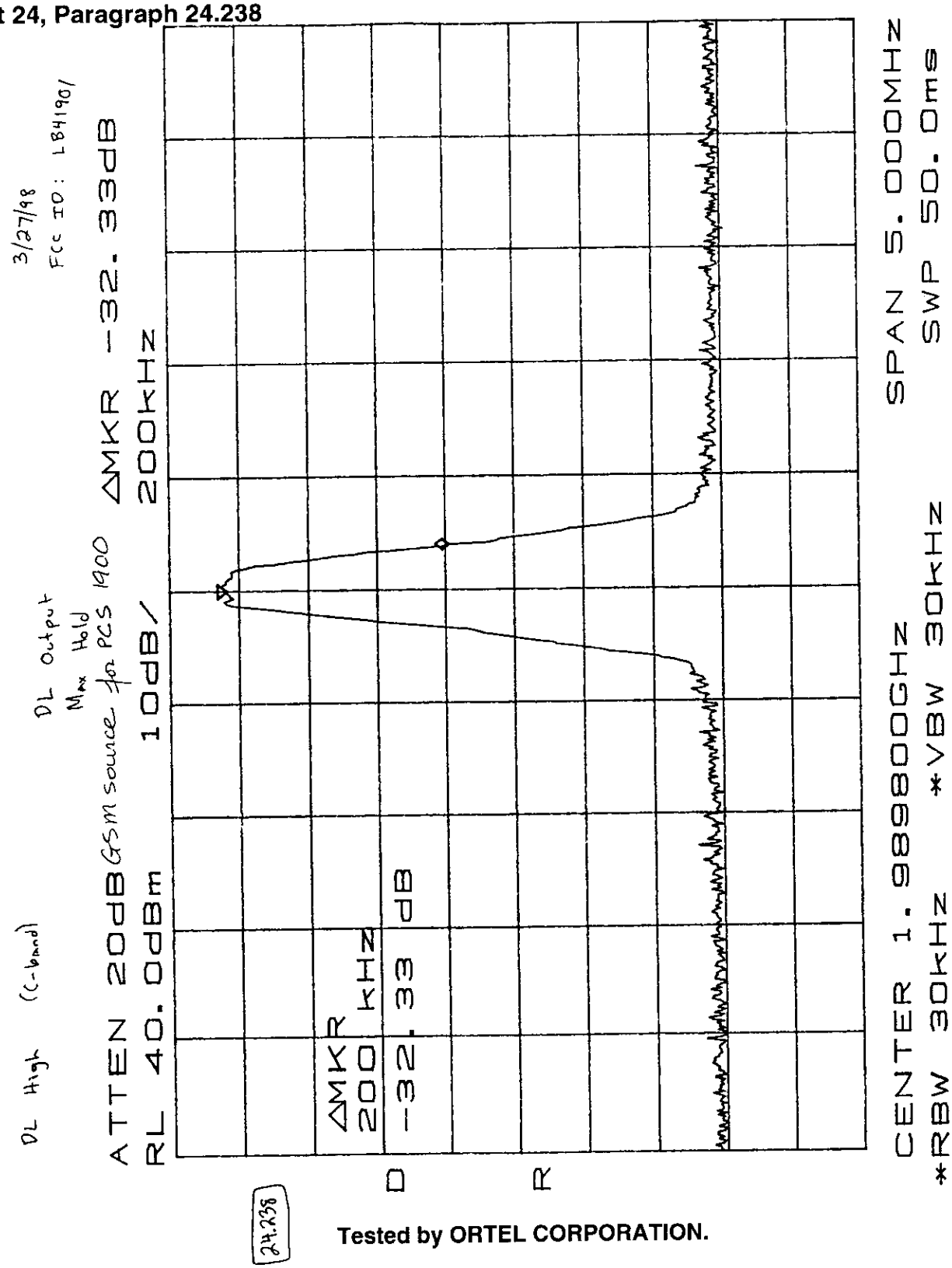

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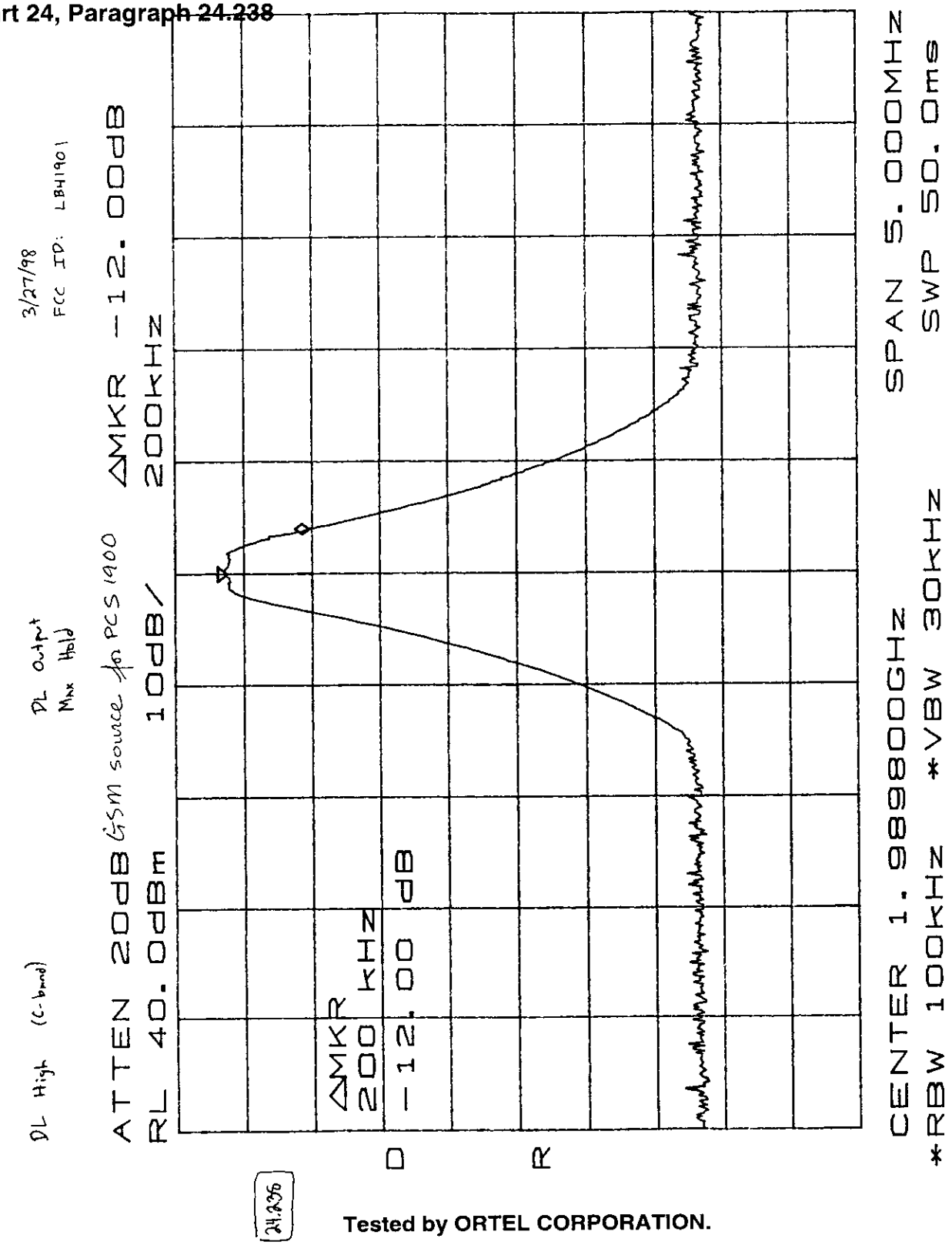

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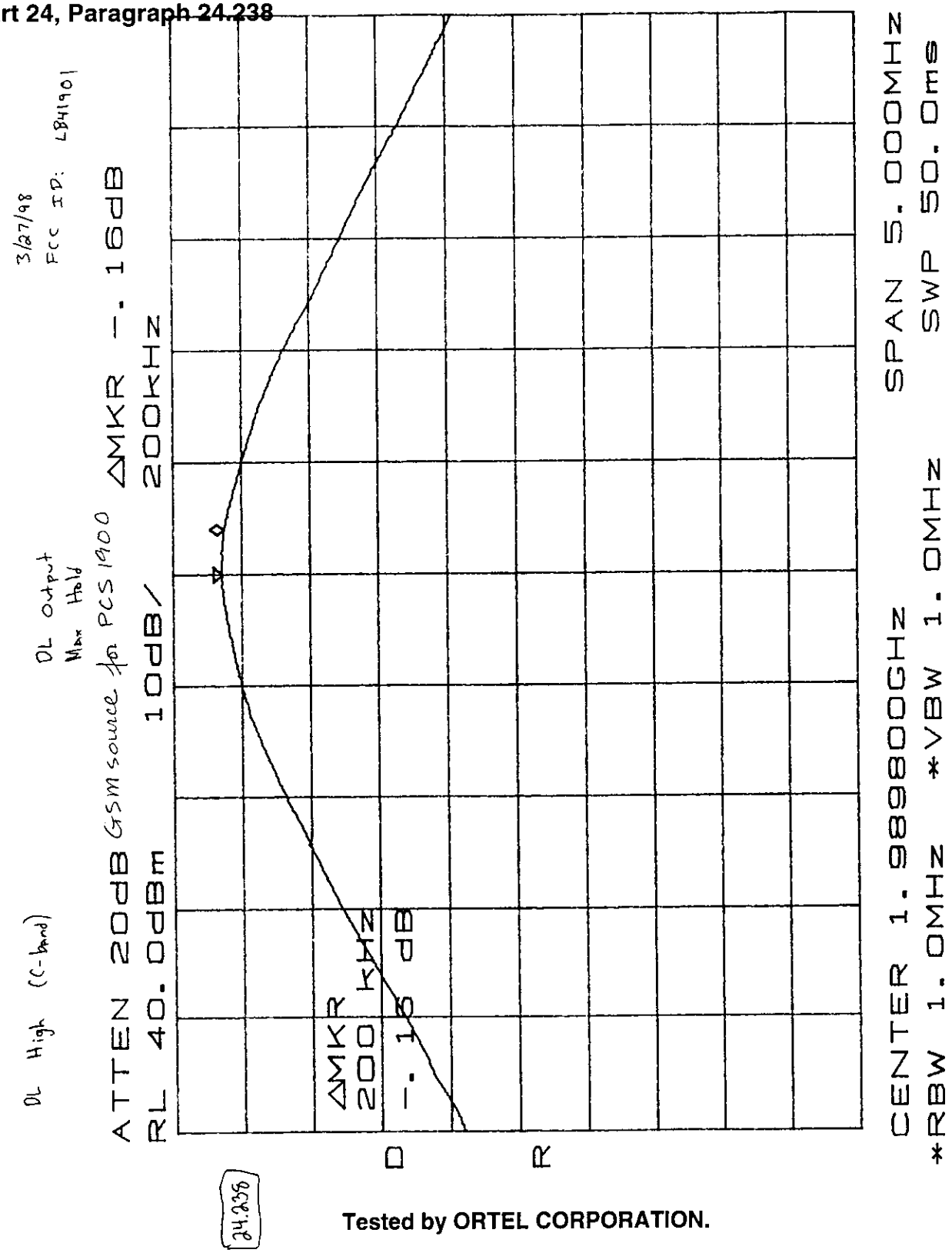
Part 24, Paragraph 24.238



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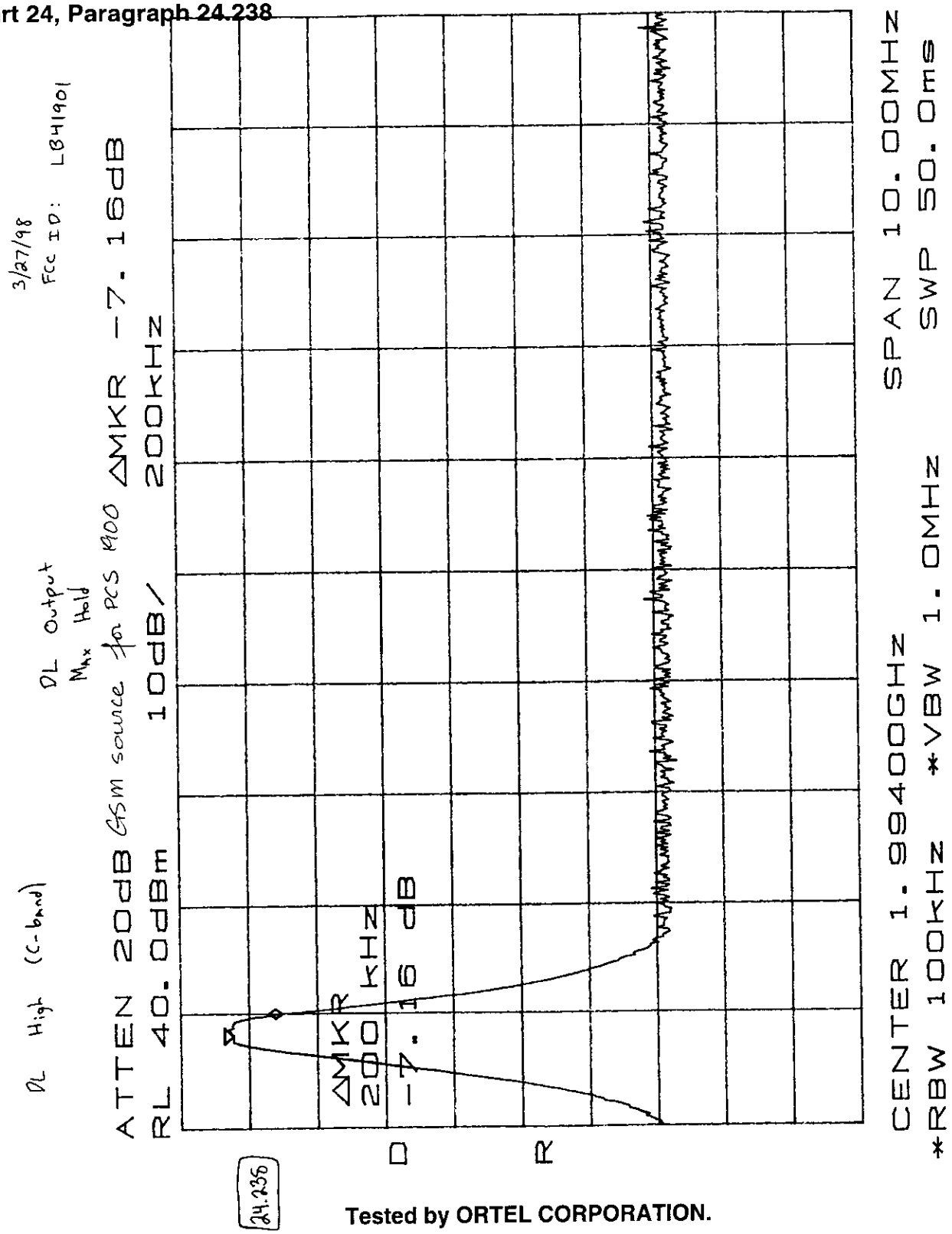

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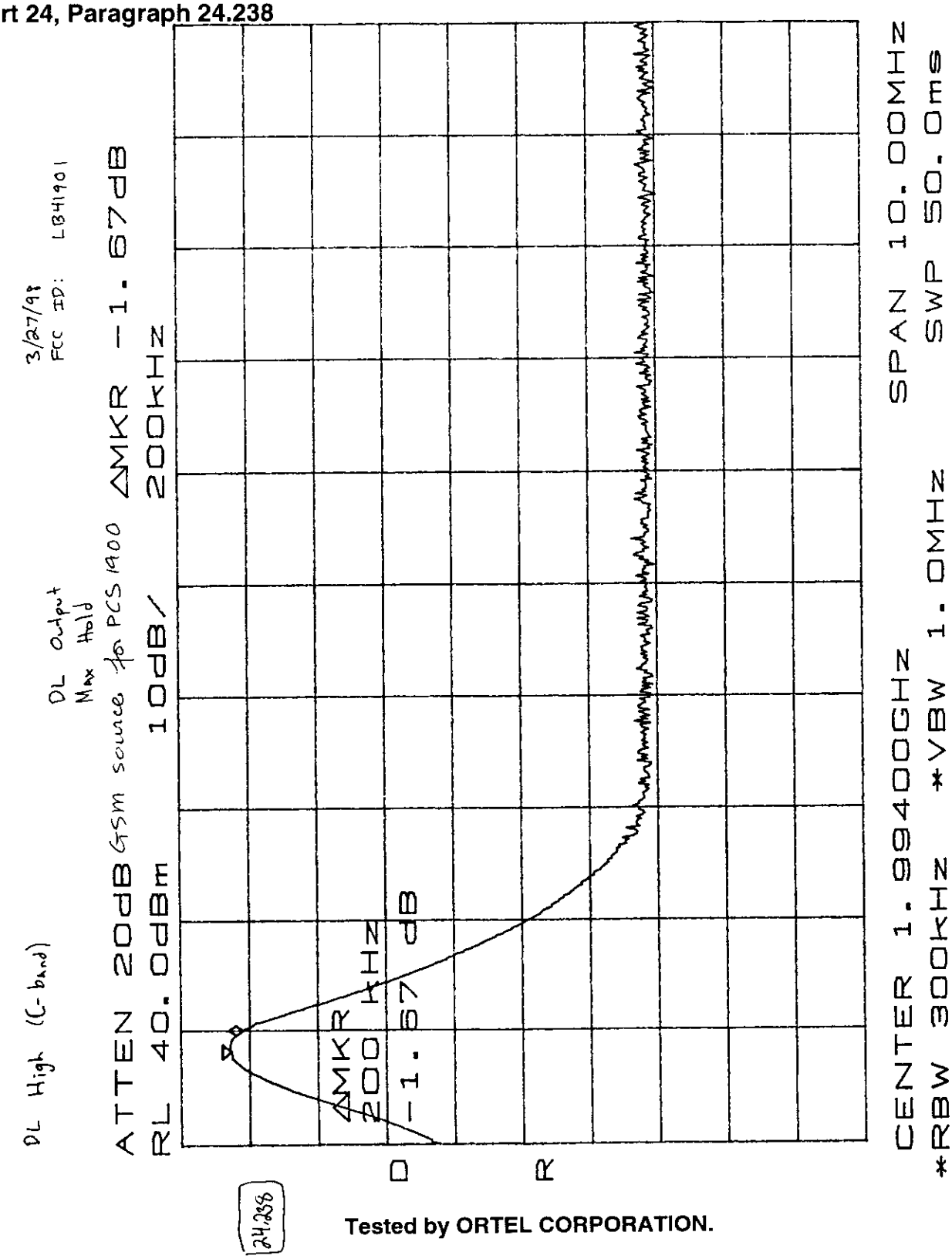

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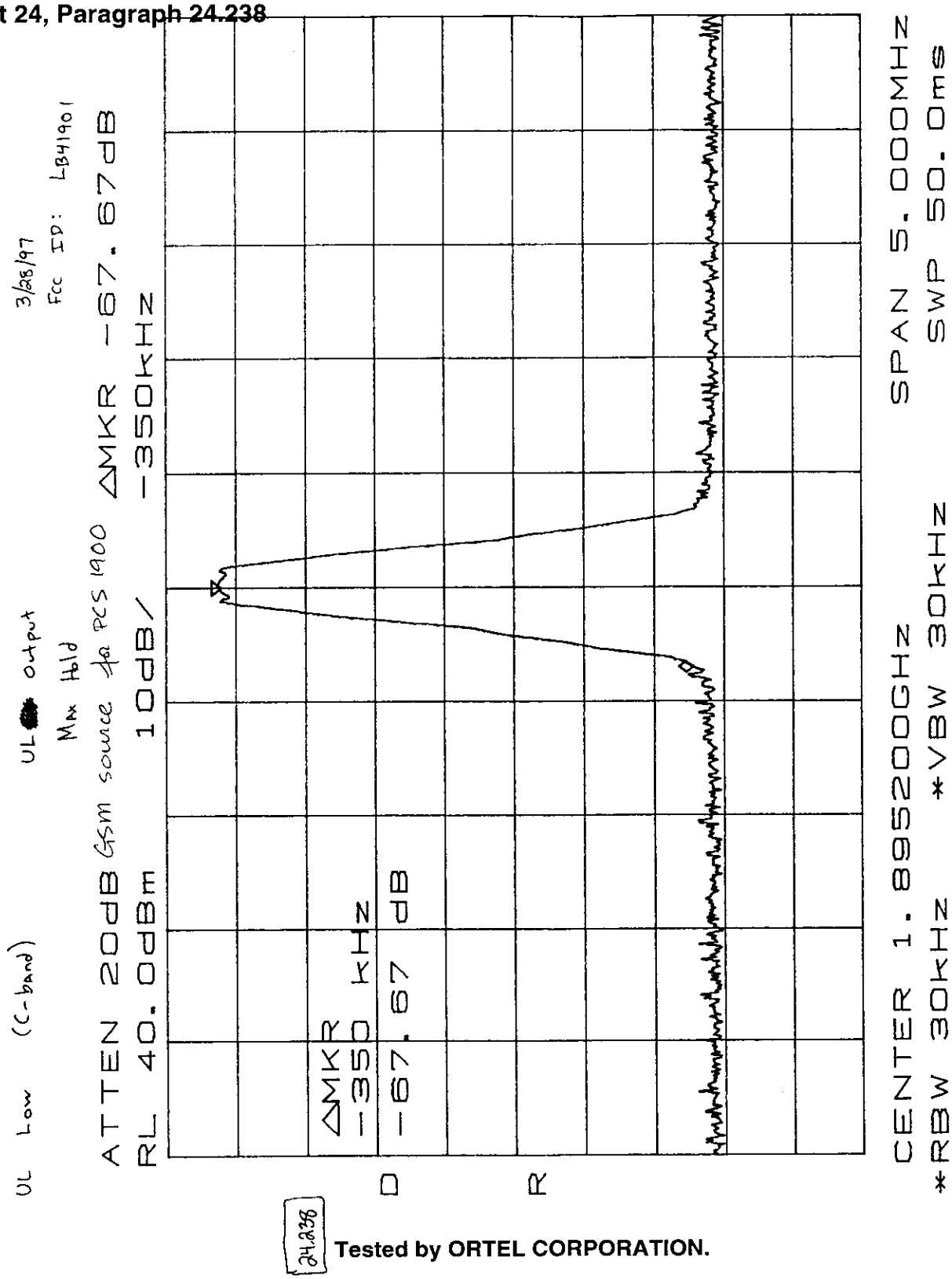
Part 24, Paragraph 24.238



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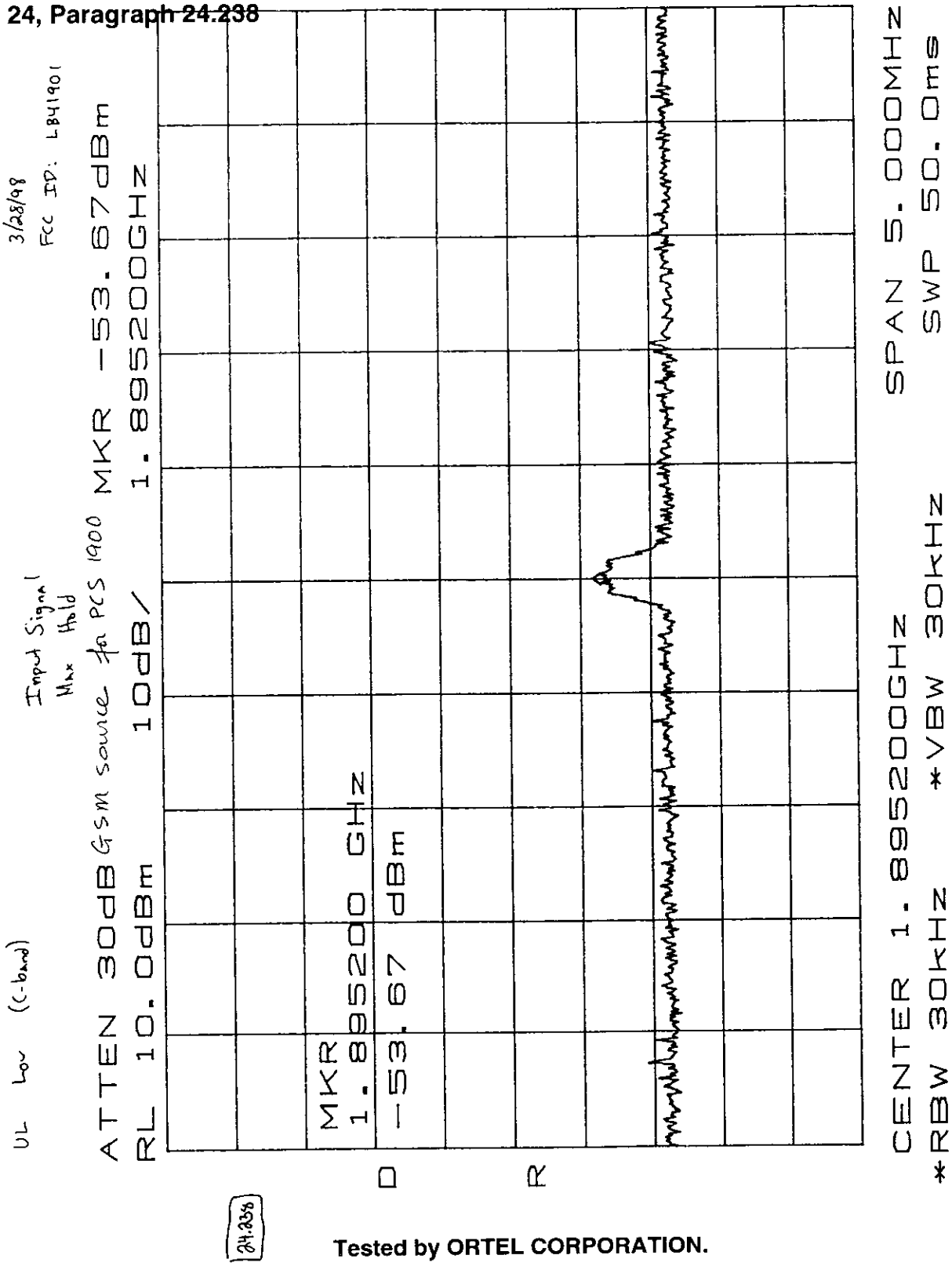
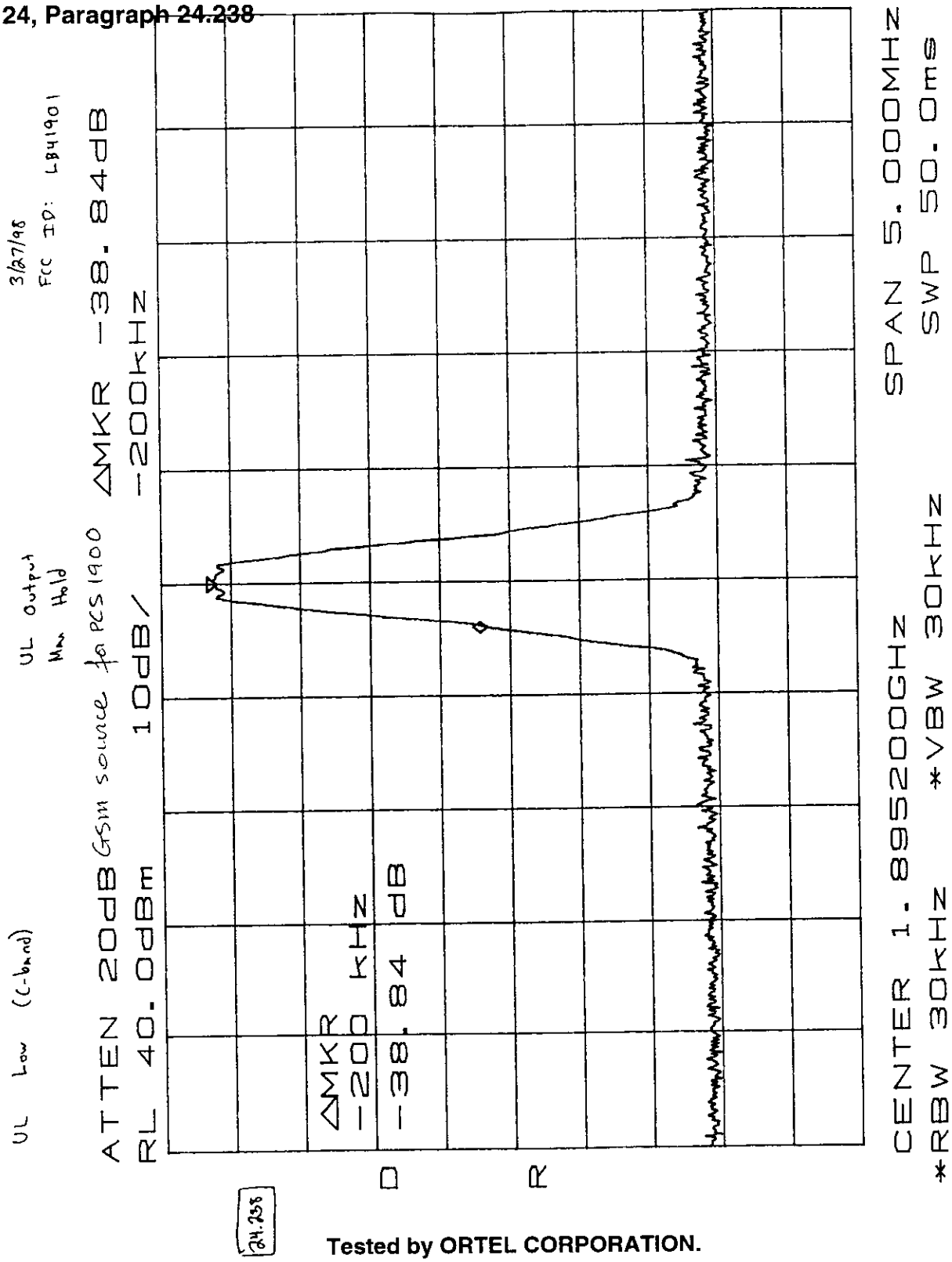
Part 24, Paragraph ~~24.238~~



Tested by ORTEL CORPORATION.

Part 24, Paragraph ~~24.238~~



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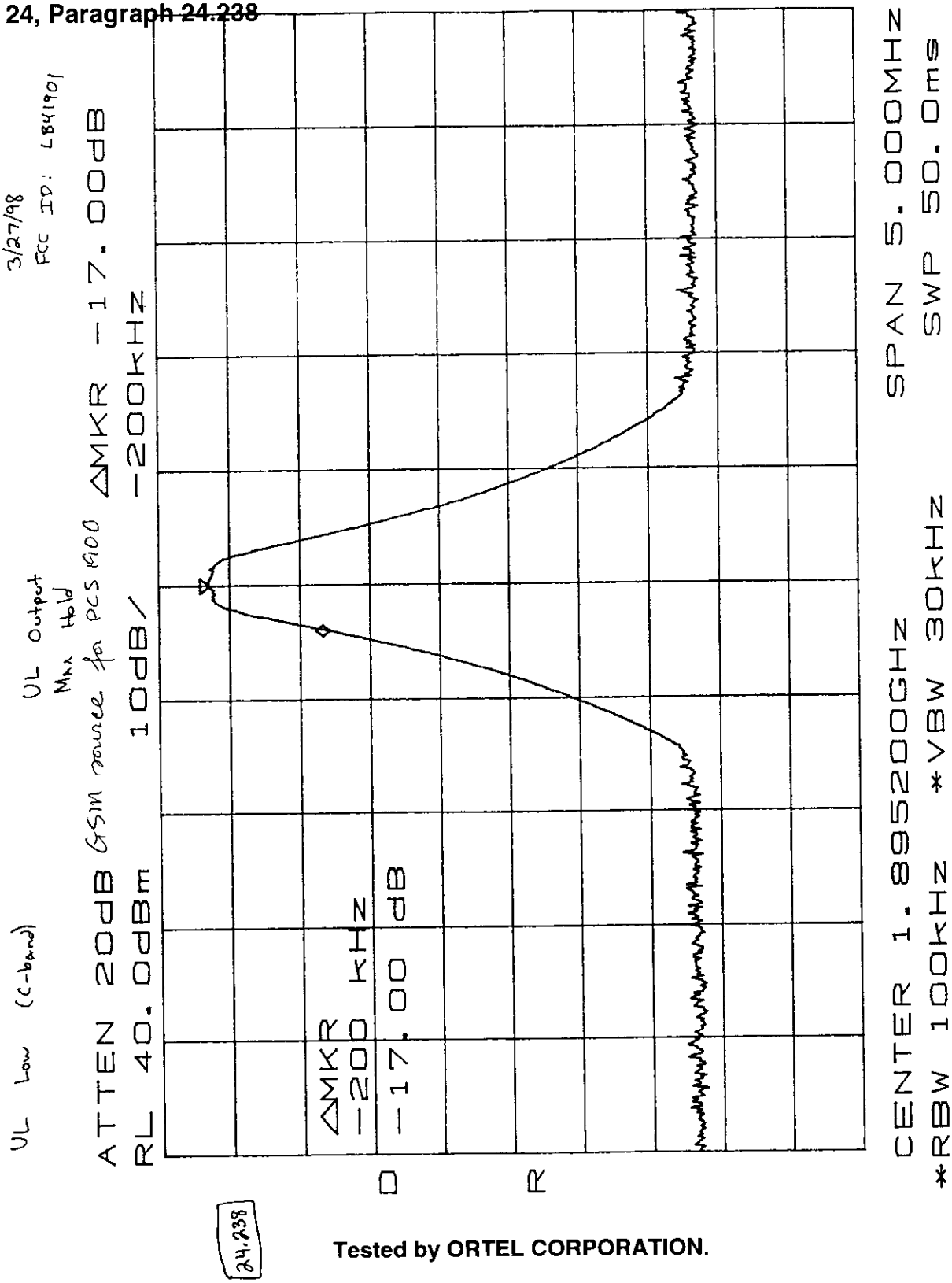

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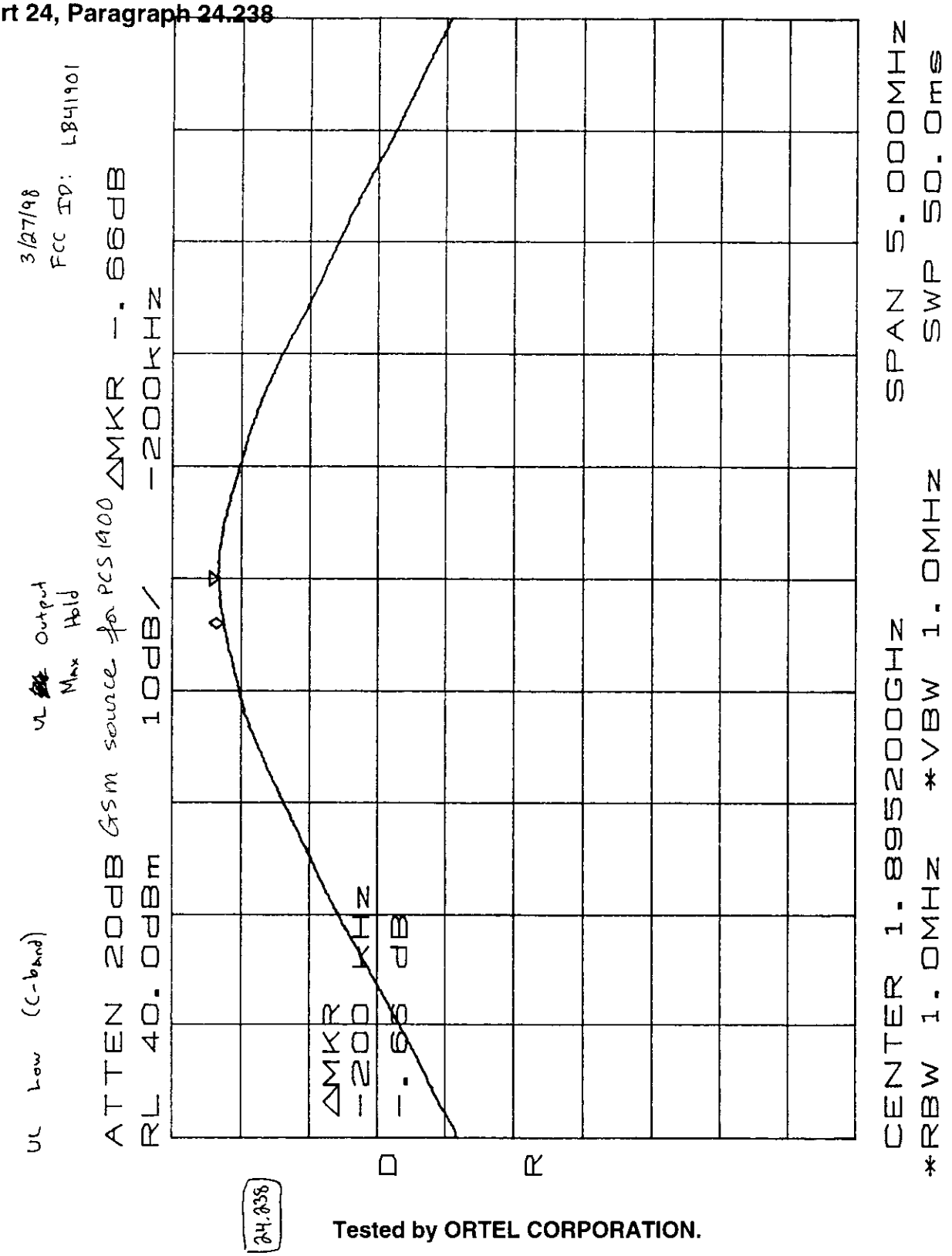

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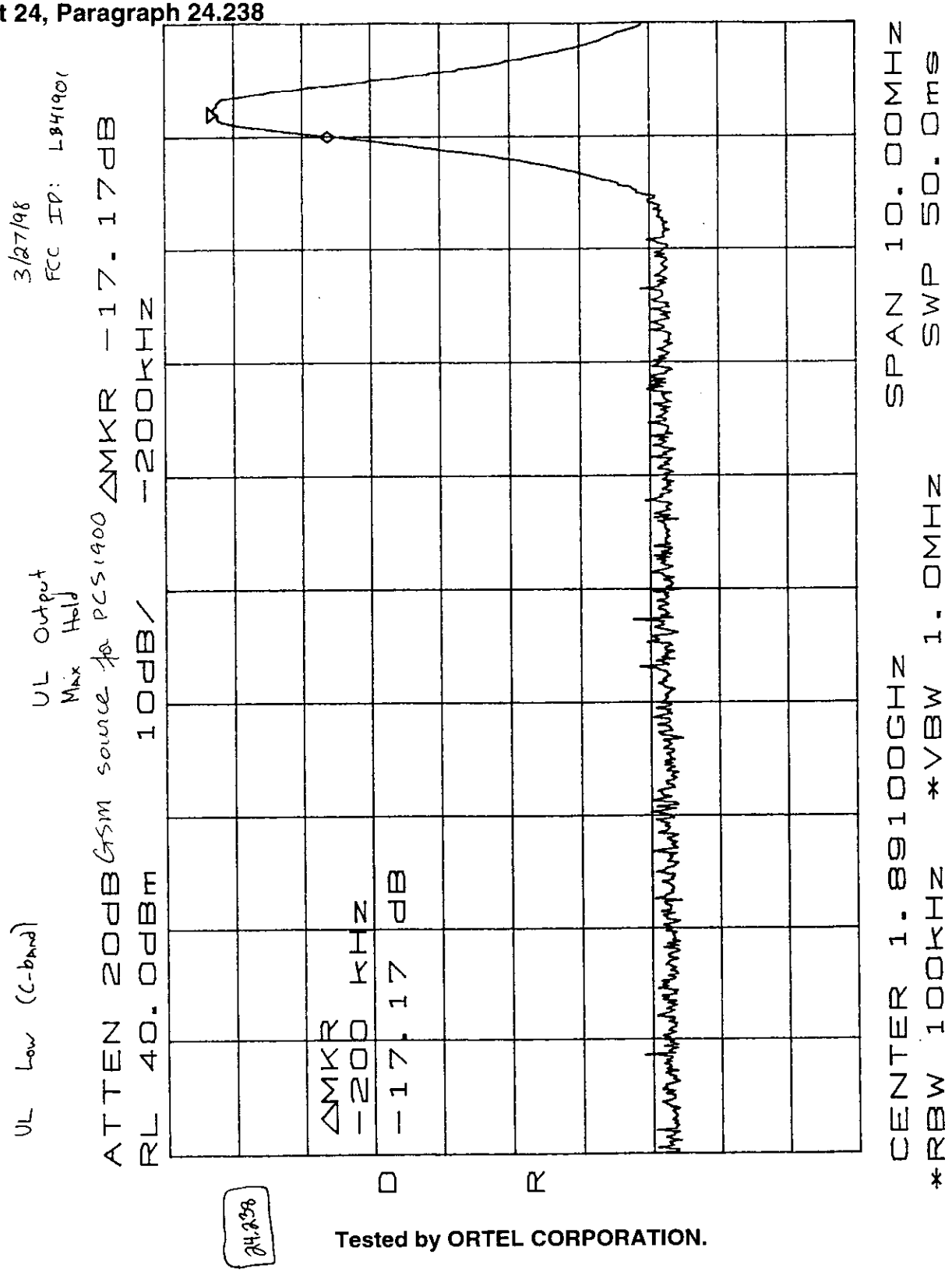

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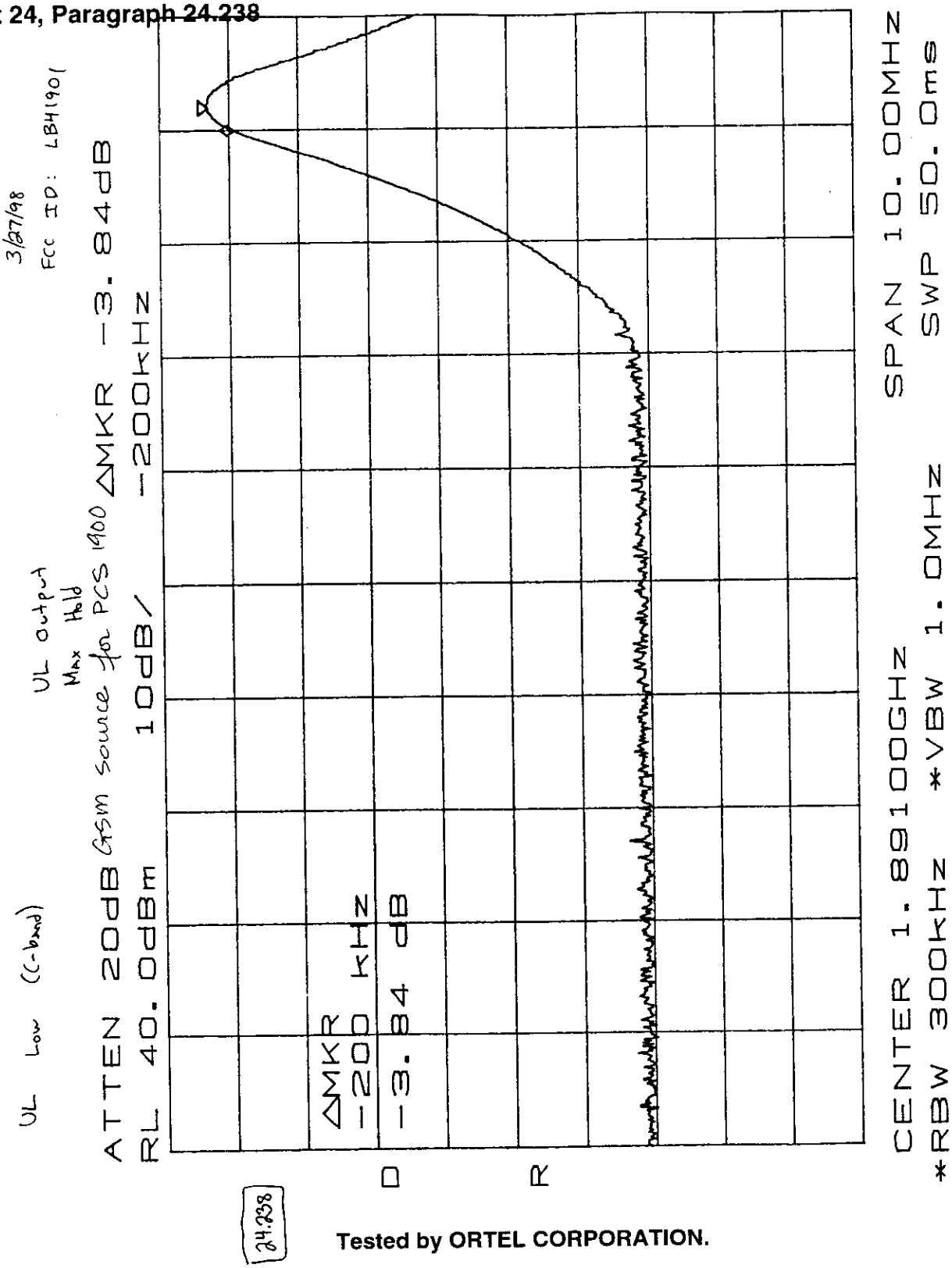

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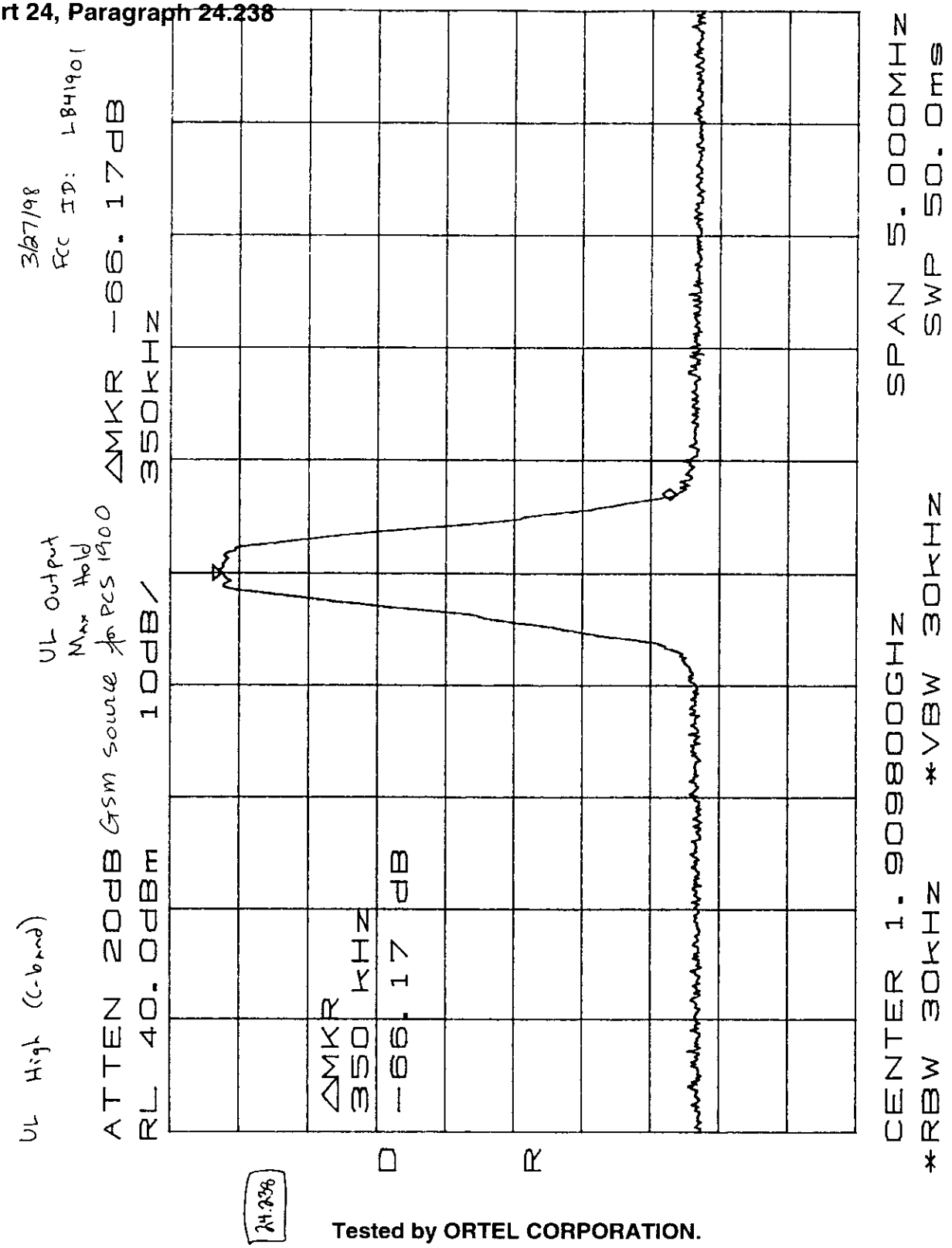
Part 24, Paragraph ~~24.238~~



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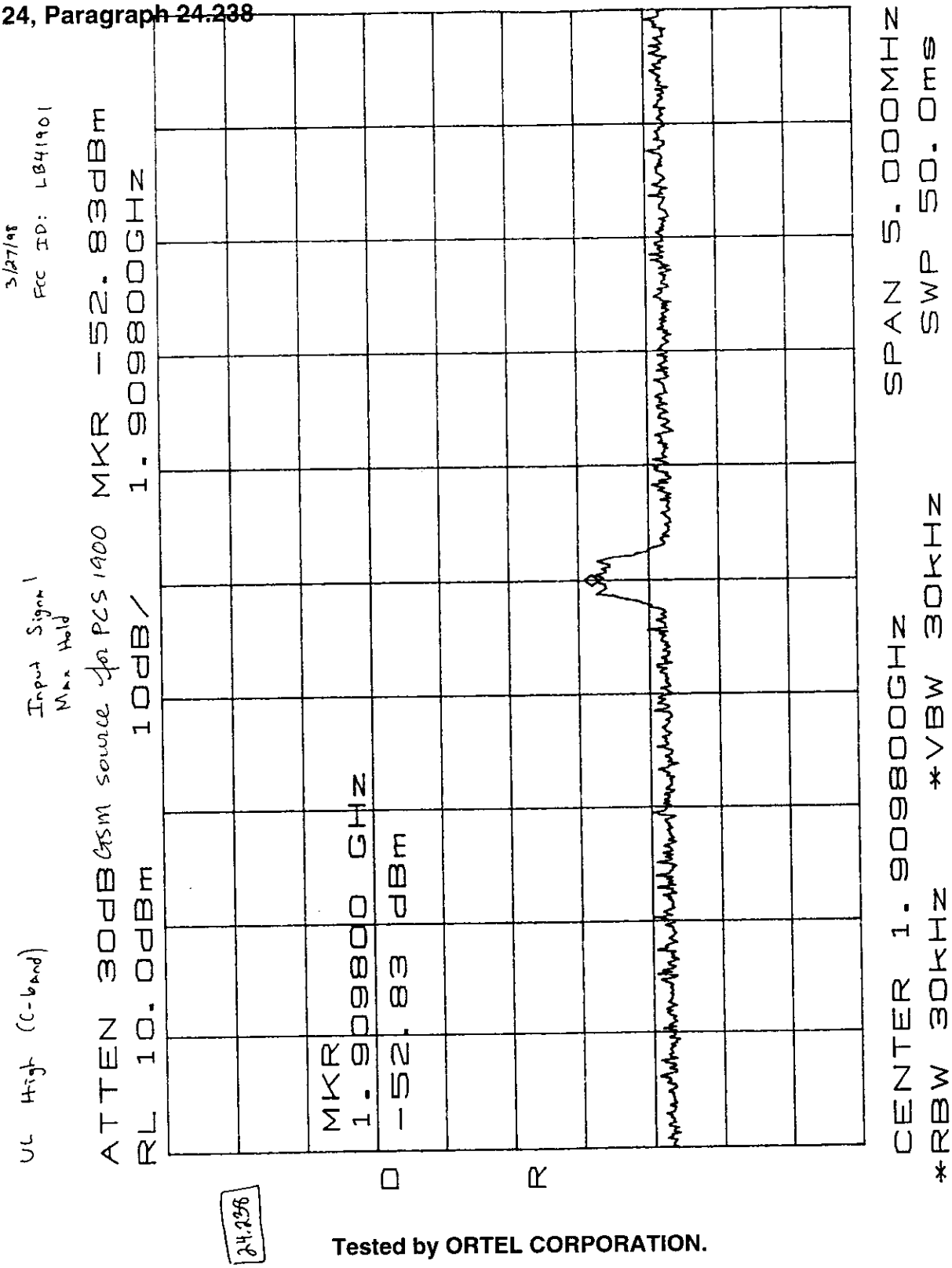

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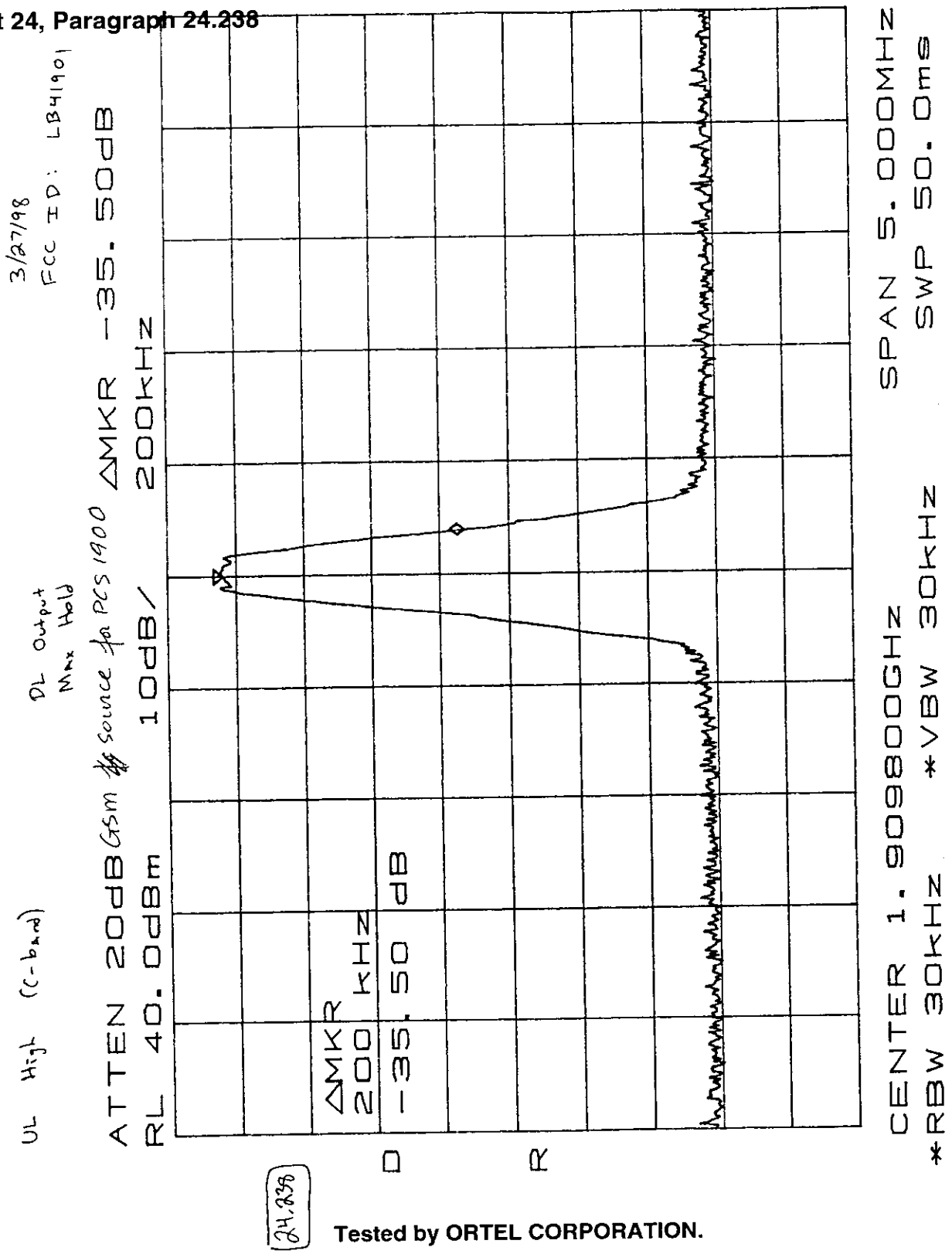

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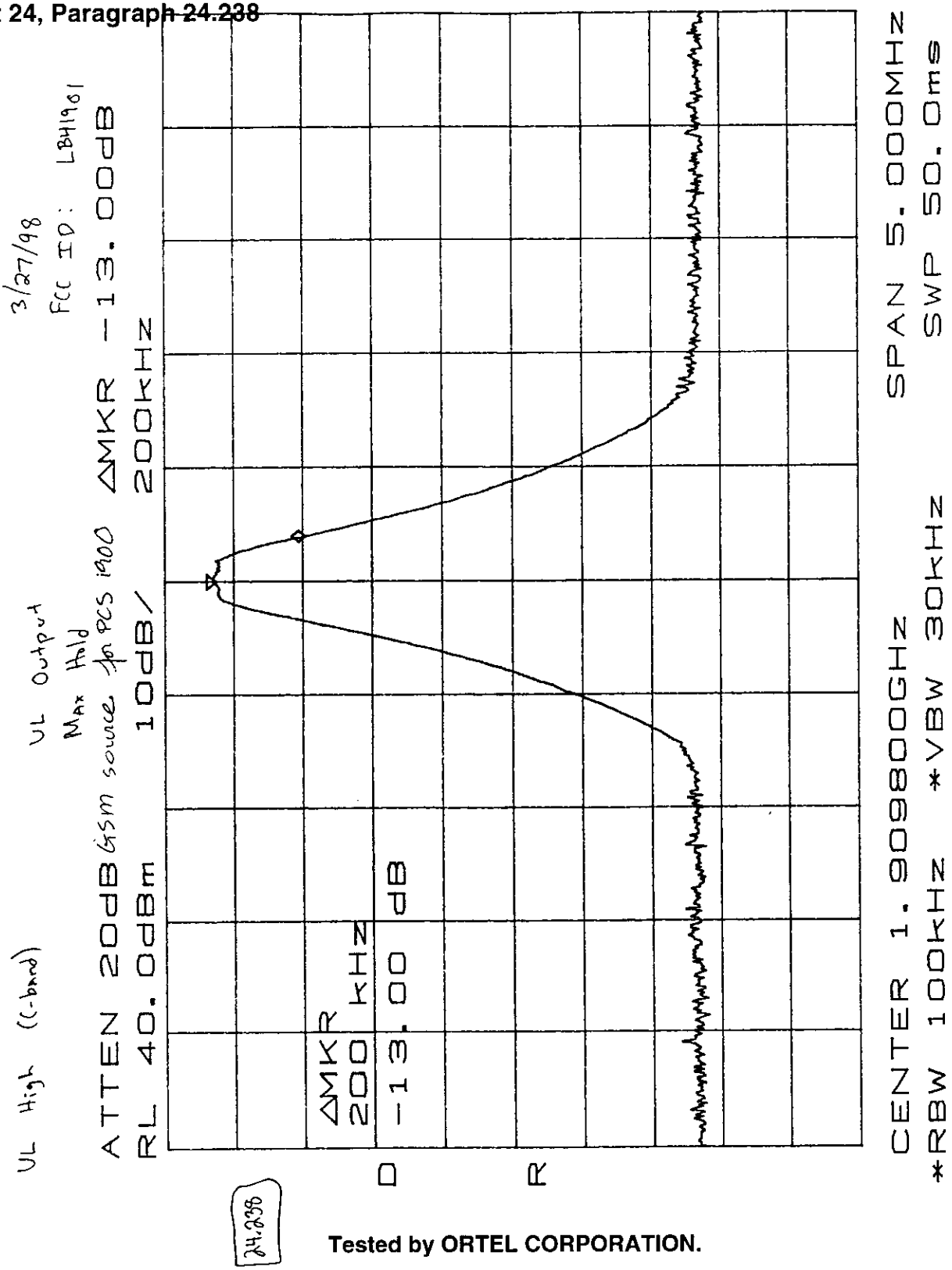

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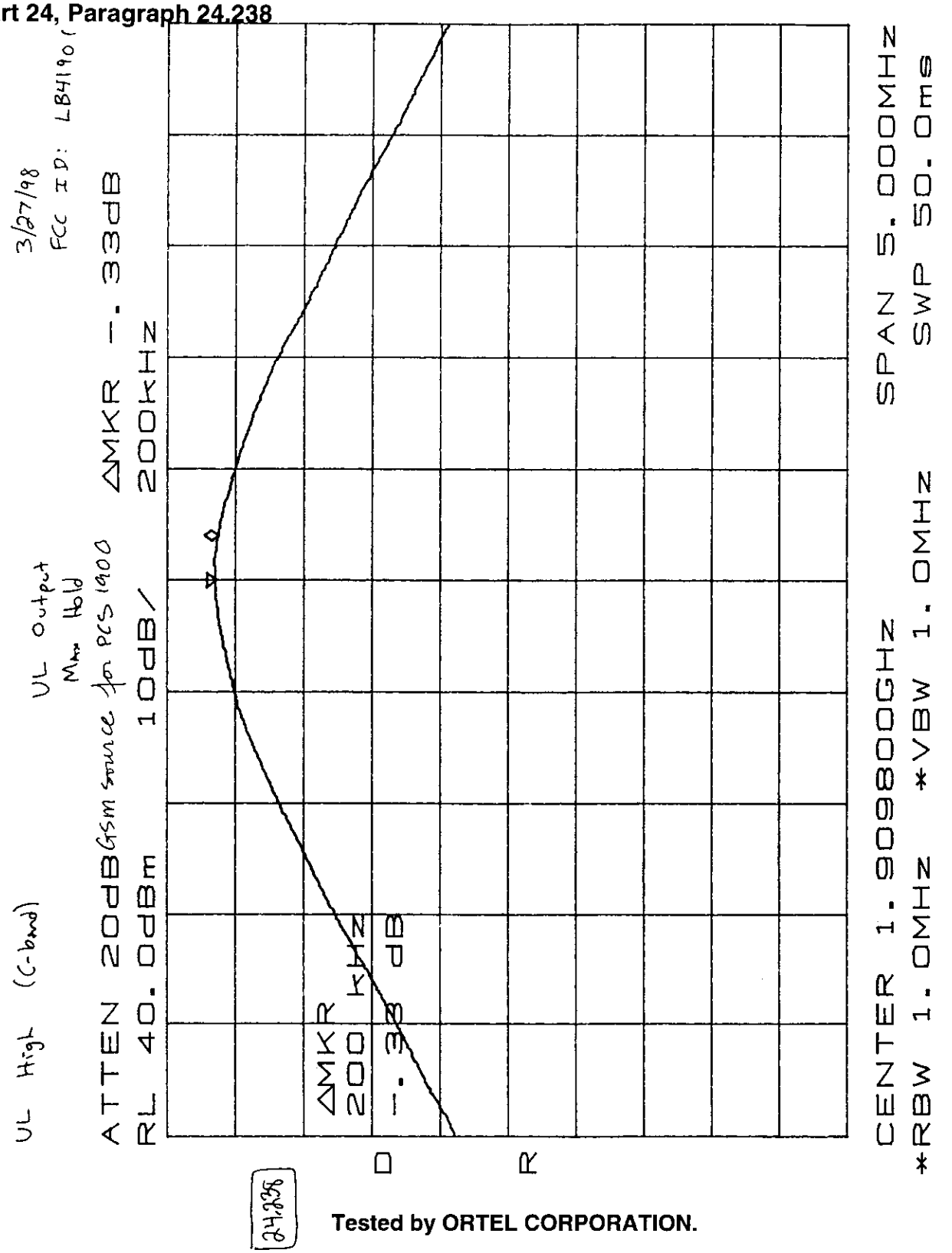

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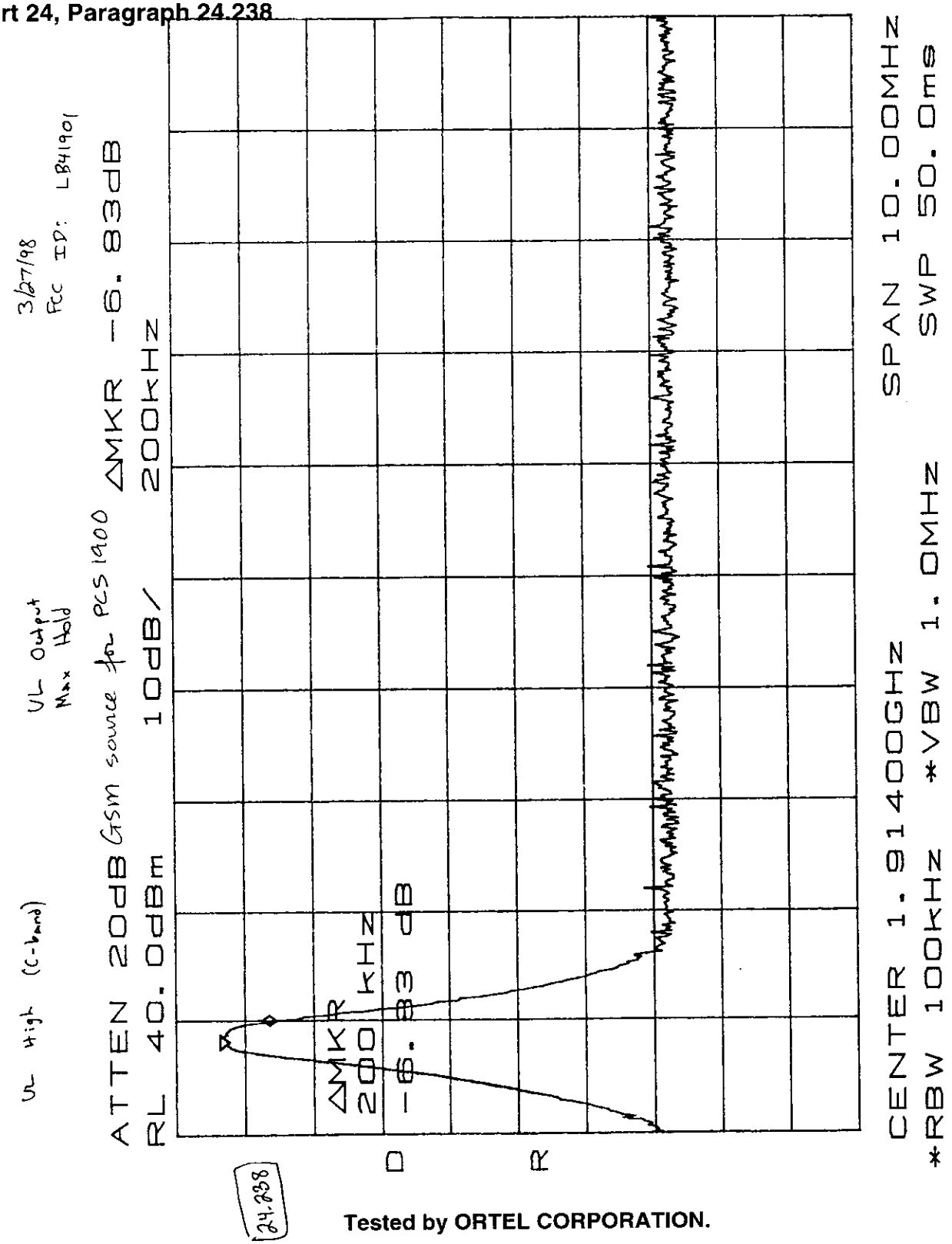
Part 24, Paragraph 24.238



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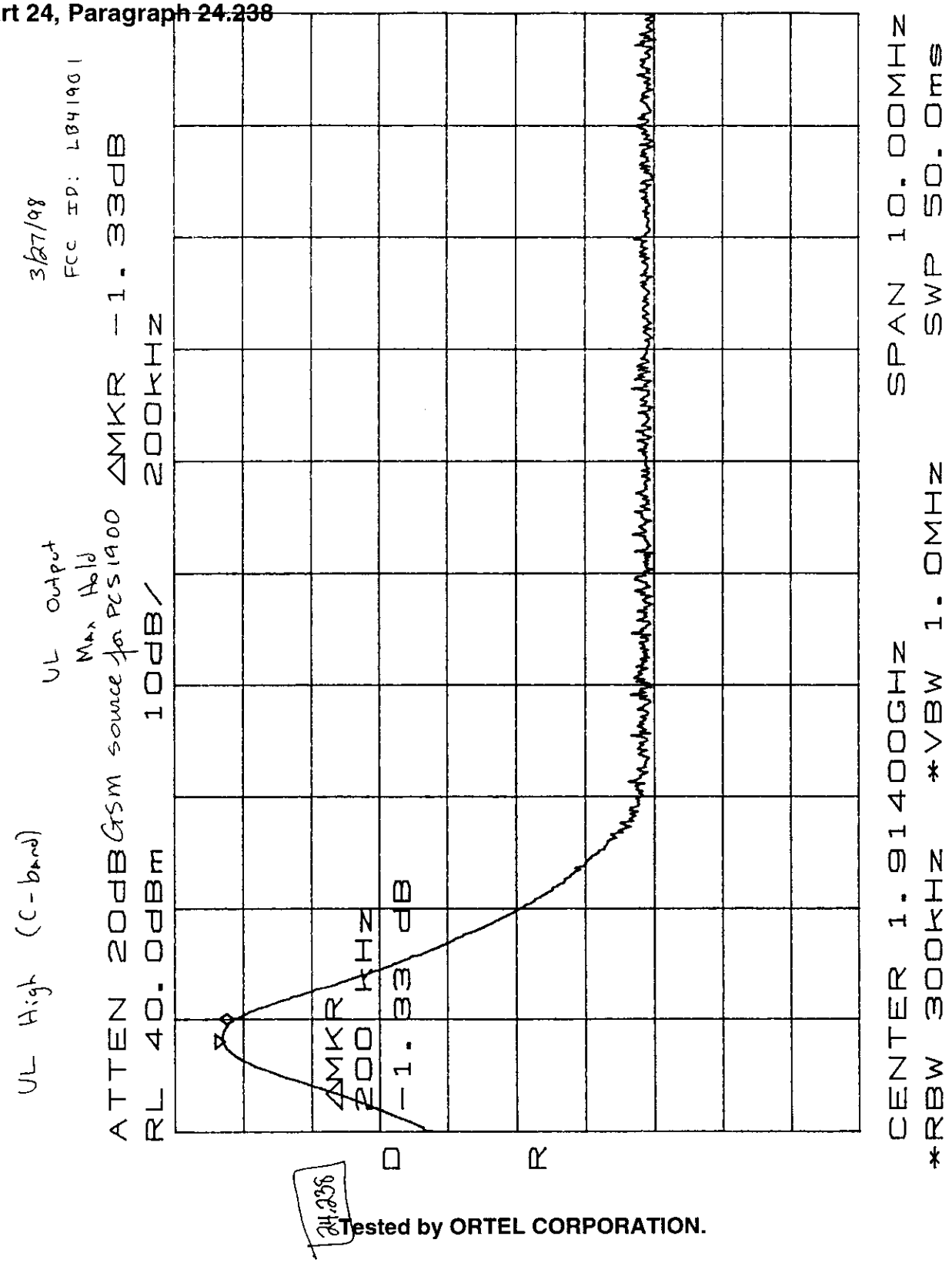

Tested by ORTEL CORPORATION.

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).

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

PRODUCT SERVICE

REPORT No: S-8181 TESTED BY: dm SPEC: FCC Para 2.993 & 24.238

CUSTOMER: Ortel Corp TEST DIST: 3 Meters

E U T: Low Power Repeater Model CSR 1902-C Band

EUT MODE: UPLINK BICONICAL: N/A

DATE: 8-Apr-98 LOG PERIODIC: N/A

NOTES: OTHER: 453

RBW & VBW 1 MHZ

Fundamental only emission measurable @ 3 meters all other measurements are noise floor readings.

FREQ (MHz)	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CORRECTION FACTOR (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotatio	Antenna Height	
1895.2	36.3		32.1		32.4	**68.7**						180	1.75	
3790.4	-4.1		-2		39.8	**37.8**		84.4		-46.6				
5685.4	-4.2		-2		43.4	**41.4**		84.4		-43				
1902.4	29.2		22.5		32.5	**61.7**						180	1.5	
3804.8	-4.2		-1.6		39.9	**38.3**		84.4		-46.1				
1909.8	30.6		23.5		32.5	**63.1**								
3819.6	-4.3		-3.6		39.9	**36.3**		84.4		-48.1		180	1.5	

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

TÜV PRODUCT SERVICE

REPORT No: S-8181 TESTED BY: dm SPEC: FCC Para. 2.993 & 24.238

CUSTOMER: Ortel Corp TEST DIST: 3 Meters

E U T: Low Power Repeater Model CSR 1902-C Band

EUT MODE: DOWNLINK BICONICAL: N/A

DATE: 8-Apr-98 LOG PERIODIC: N/A

NOTES: OTHER: 453

RBW & VBW 1 MHZ

Fundamental only emission measurable @ 3 meters all other measurements are noise floor readings.

FREQ (MHz)	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CORRECTION FACTOR (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotatio	Antenna Height	
1975.2	33		30.8		32.9	**65.9**						180	1.75	
3950.27	-5.4		-7.6		40.4	**35.0**		84.4		-49.4				
1982.4	27.7		28.7		32.9	**61.6**						180	1.5	
3964.8	-4.3		-4.2		40.5	**36.3**		84.4		-48.1				
1989.8	34.6		28.2		32.9	**67.5**						180	2	
3979.6	-4.6		-4.2		40.5	**36.3**		84.4		-48.1				

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

TÜV PRODUCT SERVICE

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.
■ -	8566B	407	Spectrum Analyzer	Hewlett Packard	2311A02209
■ -	85662B	406	Spectrum Analyzer Display	Hewlett Packard	2309A04682
☐ -	3115	453	Antenna, Double Ridge Guide	EMCO	9412-4363
■ -	3115	251	Antenna, Double Ridge Guide	EMCO	2495
☐ -	AFD3-0102-13-ST	366	Pre-Amplifier (38 dB gain), 1 to 2 GHz	Miteq, Inc.	16429
■ -	AFD3-0208-40-ST	367	Pre-Amplifier (30 dB gain), 2 to 8 GHz	Miteq, Inc.	155382
■ -	AFS4-08001800-70-10P-4	368	Pre-Amplifier (22 dB gain), 8 to 18 GHz	Miteq, Inc.	167
☐ -	91888-2	252	Horn Antenna (1 to 2 GHz)	Eaton	101
☐ -	91889-2	253	Horn Antenna (2 to 3.6 GHz)	Eaton	101
☐ -	91892-1	254	Reflector Antenna (3.6 to 18 GHz)	Eaton	--
☐ -	94613-1	255	Horn Antenna (3.6 to 7.6 GHz)	Eaton	--
☐ -	91891-2	256	Horn Antenna (7.3 to 12 GHz)	Eaton	--
☐ -	94614-1	257	Horn Antenna (12 to 18 GHz)	Eaton	--

Remarks: _____

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