MEASUREMENT AND TECHNICAL REPORT

LITTLEFEET, INC.
13000 Gregg Street
Poway, CA 92064

DATE: 03 August 2001

This Report Concerns:	Original Grant: X	Class II Change:
Equipment Type:	cSpice 1900 MHz, Model GL 1902C	
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: X

(*) FCC Part 2, Paragraphs 2.1046, 2.1049, 2.,1051, 2.1053, 2.1055(d)(1); Part 24, Paragraph 24,238

Report Prepared by:

TÜV PRODUCT SERVICE
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 546 3999
Fax: 858 546 0364

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TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

1 GENERAL INFORMATION

1.1 Product Description

CSPICE 1900 MHz, Model GL1902C (Frequency Translating Repeater System)

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 20-56 Vdc (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: N/A

Current (Amps/phase(max)): 5A Current (Amps/phase(nominal)):

Other: External AC/DC power supply used to power EUT.

Typical Installation and/or Operating Environment

CSPICE will be installed outdoors on sides of buildings, roof tops, light poles.

EUT Power Cable

☐ Permanent OR X Removable Length (in meters): 2 meters typical

☐ Shielded OR X Unshielded

EUT Interface Ports and Cables

Interface				Shielding								
Type	Analog	Digital		Yes	No	Type	Termination	Connector Type	Port Termination		Removable	Permanent
Link Antenna	X		1	X		Catur	Coaxial	N Type	50-Ohm			X

Support Equipment -

Description	*Model #*	*Serial #*	*FCC ID #*
LapTop, Jet Bood	7620L	TN4H01037875	N/A
AC/DC Power Supply External	00003	--	--

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
133 MHz	--	Crystal oscillator	--
13 MHz	--	Crystal oscillator	--
MHz	1730-1790	Local Oscillator	Downlink
MHz	1640-1710	Local Oscillator	Uplink

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Power Supply			
Manufacturer	***Model #***		***Type***
Mesa Power	--		Switched-mode

1.2 Related Submittal/Grant

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

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

Test Performed:

- X 1. Conducted Emissions, FCC Part 2, Paragraphs 2.1049, 2.1051, and Part 24, Paragraph 22,238
- 2. Radiated Emissions EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters
- X 3. Radiated Emission per FCC Part 2, Paragraph 2.1053
- 4. Engineering evaluations
- X 5. Frequency Stability, Part 2, Paragraph 2.1055(d)(1)
- X RF Output Power, Part 2, Paragraph 2.1046

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 25 GHz).

1.5 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: 858 546 3999
Fax: 858 546 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.

1.6 Part 2 Requirements

Equipment Specifications

Freq. Range in MHz	Rated RF Power output in watts	Freq. Tolerance %, Hz, ppm	Emission Des.	Microprocessor
1850-1910	10 watts	0.05 ppm	200KGXW	PC104
1930-1990	5 watts	0.05 ppm	200KGXW	PC104

GXW

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emission in the following configuration:

See Block Diagram.

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Modification

None

2.5 Configuration of Tested System

See Block Diagram.

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3 RADIATED EMISSION EQUIPMENT/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).

See test setup photos for radiated emissions test setup.

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

REPORT No: SC-105529 TESTER: Dave Bernardin SPE 2.1053

CUSTOMER: Littlefeet, Inc. TEST DIST: 3 Meters

E U T: C-Spice Model GL1902C S/N 012901001001 TEST SITE: Roof

EUT MODE: Uplink Normal Mode GSM Modulation BICONICAL: N/A

DATE: July 24, 2001 Channel 1 LOG: N/A

NOTES: Duty Cycle= 100% OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

v.beta1a

FREQ (MHz) LOW BAND	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height	Notes
1851.2	26.6	2.8	40	3.1	7.3	**47.3**		130		-82.7		184	1.2	EUT
3702.4	10.7	2.7	11.5	2.4	15.2	**26.7**		130		-103		180	1	Noise level no measurable signals
5553.6	11.9	2.5	11.9	3.1	21.2	**33.1**		130		-96.9		0	1	Noise level no measurable signals
7404.8	16.8	8.2	17	8.1	22.2	**39.2**		130		-90.8		180	1	Noise level no measurable signals
9256	18.2	8.9	18.4	8.9	26.3	**44.7**		130		-85.3		0	1	Noise level no measurable signals
11107.2	17.2	8.1	18.1	8.1	30.8	**48.9**		130		-81.1		180	1	Noise level no measurable signals
12958.4	21.4	13.5	23.3	13.5	28.5	**51.8**		130		-78.2		0	1	Noise level no measurable signals
14809.6	22.4	14.4	23.7	14.4	35.4	**59.1**		130		-70.9		180	1	Noise level no measurable signals
16660.8	23.7	15.5	24.6	14.5	38.2	**62.8**		130		-67.2		0	1	Noise level no measurable signals

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DATE: July 24, 2001 Channel 1 LOG: N/A

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below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

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FREQ (MHz) MID BAND	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height	Notes
1888.8	11.4	2.8	12.5	3.2	7.6	**20.1**		130		-110		0	1	Noise level no measurable signals
3777.6	11.8	2.8	11.5	2.7	15.7	**27.5**		130		-102		180	1	Noise level no measurable signals
5666.4	12.6	2.7	12.5	3.1	21.5	**34.1**		130		-95.9		0	1	Noise level no measurable signals
7555.2	18	8.6	17.3	8.6	22.3	**40.3**		130		-89.7		180	1	Noise level no measurable signals
9444	17.5	8.7	17.4	8.6	26.2	**43.7**		130		-86.3		0	1	Noise level no measurable signals
11332.8	19	8.1	17.5	8.1	31.6	**50.6**		130		-79.4		180	1	Noise level no measurable signals
13221.6	22.9	13.2	21.5	13.2	28.6	**51.5**		130		-78.5		0	1	Noise level no measurable signals
15110.4	24	14.5	24.5	14.5	36.2	**60.7**		130		-69.3		180	1	Noise level no measurable signals
16999.2	25	15.2	25.3	15.2	38.9	**64.2**		130		-65.8		0	1	Noise level no measurable signals

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below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

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FREQ (MHz) HIGH BAND	VERTICAL (dBuv) pk	VERTICAL (dBuv) av	HORIZONTAL (dBuv) pk	HORIZONTAL (dBuv) av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	MAX LEVEL (dBuV/m) av	SPEC LIMIT (dBuV/m) pk	SPEC LIMIT (dBuV/m) av	MARGIN (dB) pk	MARGIN (dB) av	EUT Rotation	Antenna Height	Notes
1909.8	11.5	2.8	11.9	3.1	7.8	**19.7**		130		-110		0	1	Noise level no measurable signals
3819.6	11.1	2.3	12.8	2.4	16.0	**28.8**		130		-101		180	1	Noise level no measurable signals
5729.4	12.2	3	11.3	3.1	21.6	**33.8**		130		-96.2		0	1	Noise level no measurable signals
7639.2	16.8	8.4	18.1	8.4	22.4	**40.5**		130		-89.5		180	1	Noise level no measurable signals
9549	17.1	8.7	17.5	8.6	26.2	**43.7**		130		-86.3		0	1	Noise level no measurable signals
11458.8	17.4	8.2	17.3	8.3	32.1	**49.5**		130		-80.5		180	1	Noise level no measurable signals
13368.6	22.9	13.6	22.2	13.6	28.6	**51.5**		130		-78.5		0	1	Noise level no measurable signals
15278.4	23.6	14.8	24.8	14.9	36.4	**61.2**		130		-68.8		180	1	Noise level no measurable signals
17188.2	24.3	14.8	25.6	14.5	41.6	**67.2**		130		-62.8		0	1	Noise level no measurable signals

REPORT No: SC-105529 TESTER: Dave Bernardin SPE 2.1053

CUSTOMER: Littlefeet, Inc. TEST DIST: 3 Meters

E U T: C-Spice Model GL1902C S/N 012901001001 TEST SITE: Roof

EUT MODE: Downlink Normal Mode GSM Modulation BICONICAL: N/A

DATE: July 24, 2001 Channel 2 LOG: N/A

NOTES: Duty Cycle= 100% OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

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FREQ (MHz) LOW BAND	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height	Notes
1930.2	34.5	21.3	22	10.5	7.9	**42.4**		130		-87.6		0	1	ambient
3860.4	12.9	3	11.5	2.9	16.3	**29.2**		130		-101		180	1	Noise level no measurable signals
5790.6	12.7	3.7	14	3.7	21.7	**35.7**		130		-94.3		0	1	Noise level no measurable signals
7720.8	18.2	8.8	17.4	8.7	22.4	**40.6**		130		-89.4		180	1	Noise level no measurable signals
9651	17.4	9.6	18.9	9.6	26.4	**45.3**		130		-84.7		0	1	Noise level no measurable signals
11581.2	17.1	8.4	17.2	8.4	31.9	**49.1**		130		-80.9		180	1	Noise level no measurable signals
13511.4	23.1	13	23.6	14	28.8	**52.4**		130		-77.6		0	1	Noise level no measurable signals
15441.6	24.7	14.8	24.7	14.9	36.7	**61.4**		130		-68.6		180	1	Noise level no measurable signals
17371.8	25.9	15.9	26	15.9	44.2	**70.2**		130		-59.8		0	1	Noise level no measurable signals

REPORT No: SC-105529 TESTER: Dave Bernardin SPE 2.1053

CUSTOMER: Littlefeet, Inc. TEST DIST: 3 Meters

E U T: C-Spice Model GL1902C S/N 012901001001 TEST SITE: Roof

EUT MODE: Downlink Normal Mode GSM Modulation BICONICAL: N/A

DATE: July 24, 2001 Channel 2 LOG: N/A

NOTES: Duty Cycle= 100% OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

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FREQ (MHz) MID BAND	VERTICAL (dBuv) pk	VERTICAL (dBuv) av	HORIZONTAL (dBuv) pk	HORIZONTAL (dBuv) av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	MAX LEVEL (dBuV/m) av	SPEC LIMIT (dBuV/m) pk	SPEC LIMIT (dBuV/m) av	MARGIN (dB) pk	MARGIN (dB) av	EUT Rotation	Antenna Height	Notes
1967.8	28	21.4	14.3	8.5	8.2	**36.2**		130		-93.8		0	1	ambient
3935.6	15	7	14.5	8.4	16.8	**31.8**		130		-98.2		180	1	Noise level no measurable signals
5903.4	19.8	12.9	20	12.8	22.0	**42.0**		130		-88		0	1	Noise level no measurable signals
7871.2	19.9	13	20	13	22.5	**42.5**		130		-87.5		180	1	Noise level no measurable signals
9839	20.2	13.4	21.3	13.4	26.7	**48.0**		130		-82		0	1	Noise level no measurable signals
11806.8	21.3	12.7	21	12.7	30.9	**52.2**		130		-77.8		180	1	Noise level no measurable signals
13774.6	26.1	19	26.2	19	30.0	**56.2**		130		-73.8		0	1	Noise level no measurable signals
15742.4	26.5	19	26	19	39.1	**65.6**		130		-64.4		180	1	Noise level no measurable signals
17710.2	27.1	19.8	26.8	19.9	45.7	**72.8**		130		-57.2		0	1	Noise level no measurable signals

REPORT No: SC-105529 TESTER: Dave Bernardin SPE 2.1053

CUSTOMER: Littlefeet, Inc. TEST DIST: 3 Meters

E U T: C-Spice Model GL1902C S/N 012901001001 TEST SITE: Roof

EUT MODE: Downlink Normal Mode GSM Modulation BICONICAL: N/A

DATE: July 24, 2001 Channel 2. LOG: N/A

NOTES: Duty Cycle= 100% OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

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FREQ (MHz) HIGH BAND	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height	Notes
1988.8	46.1	38	25	18.6	8.3	**54.4**		130		-75.6		0	1	ambient
3977.6	13.8	6.9	14.7	6.8	17.1	**31.8**		130		-98.2		180	1	Noise level no measurable signals
5966.4	18.6	12.7	19.7	12.7	22.1	**41.8**		130		-88.2		0	1	Noise level no measurable signals
7955.2	20.5	12.9	20.4	12.9	22.6	**43.1**		130		-86.9		180	1	Noise level no measurable signals
9944	20.3	12	21.3	13.4	26.9	**48.2**		130		-81.8		0	1	Noise level no measurable signals
11932.8	20.1	12.7	19.7	12.7	30.4	**50.5**		130		-79.5		180	1	Noise level no measurable signals
13921.6	25.6	18.6	24.2	18.6	30.7	**56.3**		130		-73.7		0	1	Noise level no measurable signals
15910.4	25.3	18.7	28	18.7	40.7	**68.7**		130		-61.3		180	1	Noise level no measurable signals
17899.2	27.2	19.9	27.1	19.9	45.4	**72.6**		130		-57.4		0	1	Noise level no measurable signals

Emissions Test Conditions: RADIATED EMISSIONS, FCC Part 2, Paragraph 2.1053

The *RADIATED EMISSIONS* measurements were performed at the following test location :

☐ **- Test not applicable**

■ - Roof, 3-Meter Open Area Test Site

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.	Cal Date
3115	251	Antenna, Horn	Electro Mechanics Co.	2595	10/01
Pre Amp	719	PreAmp 1-18 GHz	TUV PS	--	*
8566B	823	Spectrum Analyzer	Hewlett Packard	2332A02751	07/02

Remarks: (*) Verified internally

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Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna , cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

Corrected Meter Reading Limit (CMRL) = SAR + AF + CL - AG - DC

Where, SAR = Spectrum Analyzer Reading
AF = Antenna Factor
CL = Cable Loss
AG = Amplifier Gain (if any)
DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

CMRL = 29.4 dBuV + 9.2dB = 1.4 dB - 20 dB/M - 0.0 dB

CMRL = 20.0 dBuV/M

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

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4 CONDUCTED EMISSION EQUIPMENT/DATA

See following page(s).

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Emissions Test Conditions: CONDUCTED EMISSIONS, FCC Part 2, Paragraphs *2.1046, 2.1049, 2.,1051, 2.1055(d)(1); Part 24, Paragraph 24,238*

The *RADIATED EMISSIONS* measurements were performed at the following test location :

☐ **- Test not applicable**

■ - TR2 Test Room

Test Equipment Used :

HP 8566B, P/N 823, Spectrum Analyzer, Hewlett Packard, S/N 2332A02751, Cal 07/02
6843A, P/N 580, Harmonic Test Setup, Hewlett Packard, S/N 3531A-D0115, Cal 08/01
8900P, P/N 802, Power Meter, Hewlett Packard, S/N 3607B00653, Cal 04/02
HP 8566B, P/N 744, Spectrum Analyzer, Hewlett Packard, S/N 2618A02913, Cal 09/01
HP8648C, P/N 789, Signal Generator, Hewlett Packard, S/N 36AU01074, Cal 11/01
SMA Cable , United Microwave Prod, S/aN 57793*
1506A, Splitter, Weinchel Engineering, S/N M5134*
8900A, P/N 802, Power Meter, Hewlett Packard, Cal 04/02
P/N 6225, Enviromental Chamber, Tenney, Cal 04/02

(*) Verified

Remarks: _____

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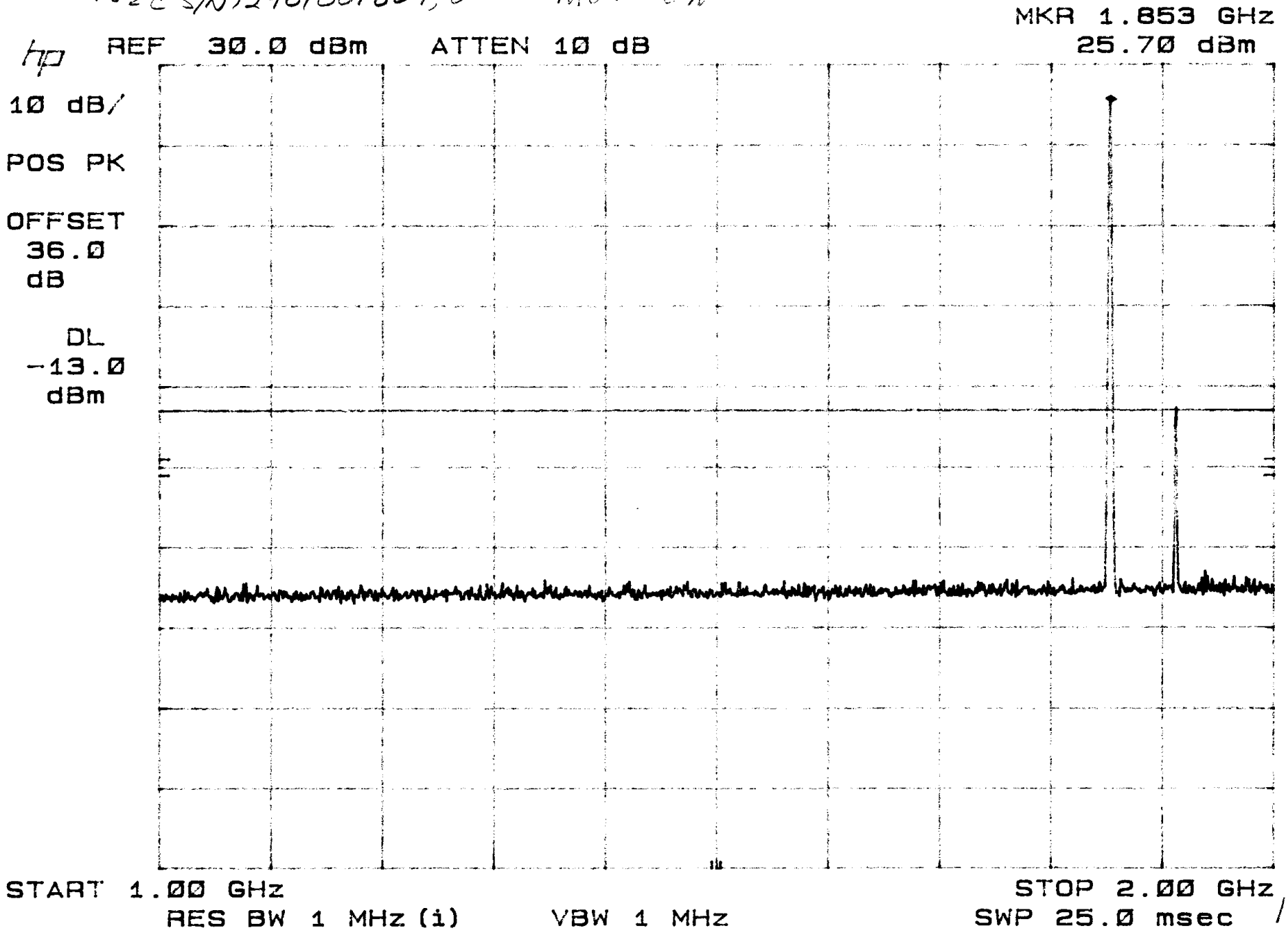
7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK LOW BAND CHANNEL 1 LINK PORT

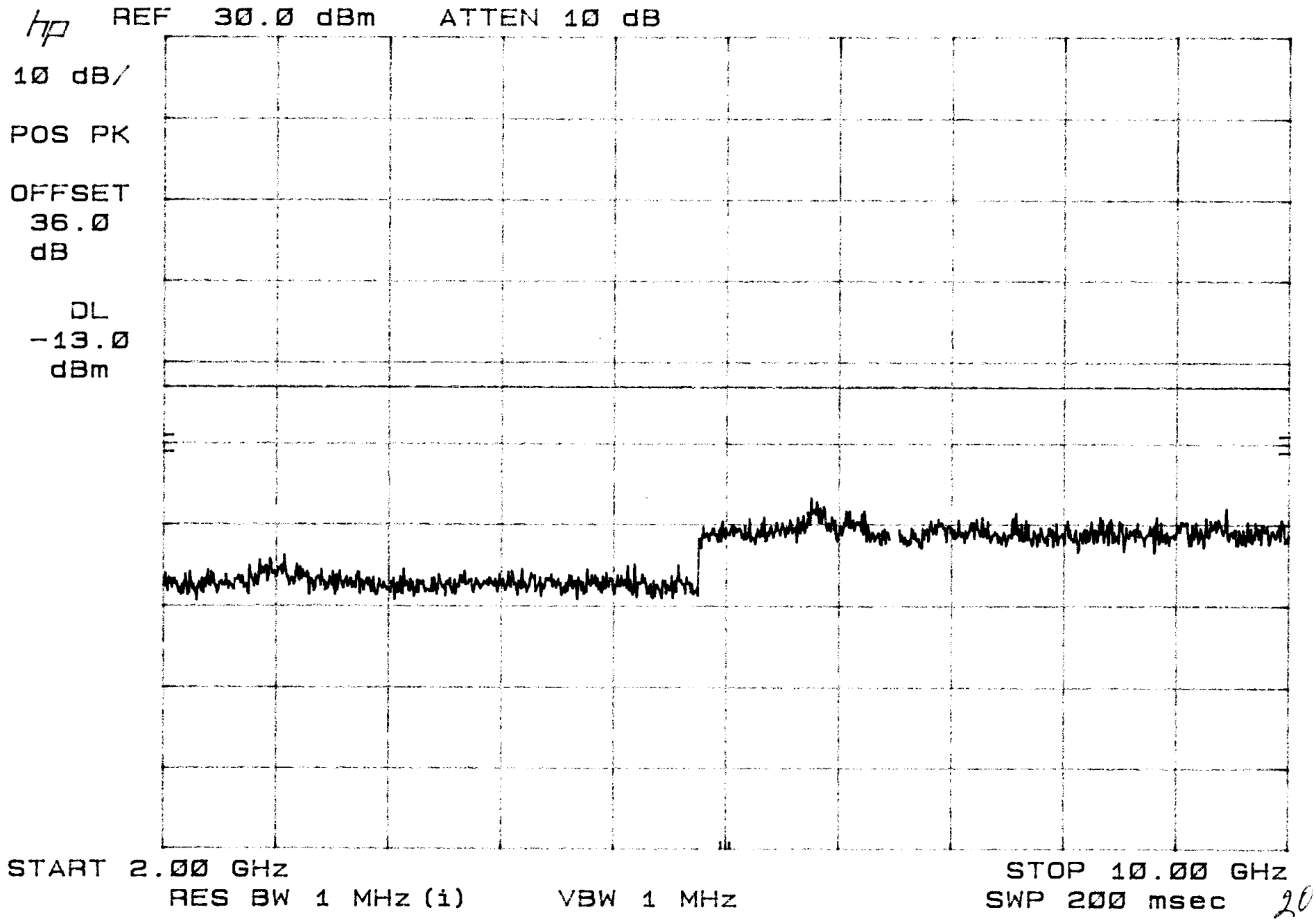
EUT: GL1902C S/N 1290100100 1, GSM MCP C1



7/25/01 TEST: SPURIOUS EMISSIONS FANTENNA PORT'S SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK LOW BAND CHANNEL 1 LINK PORT

EUT: GL1902C S/N 129010001001 GSM modulation ON



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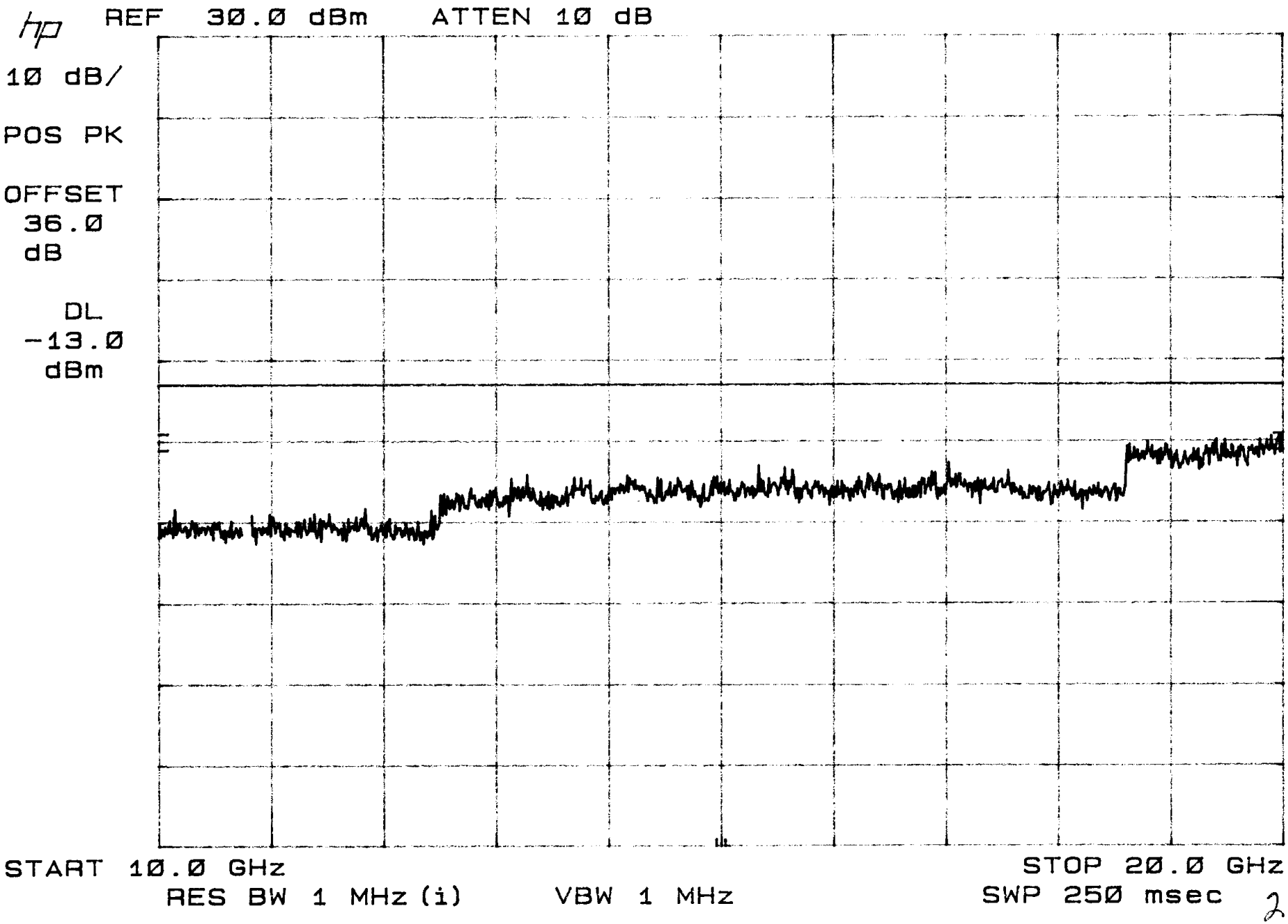
7/25/01 TEST: SPURIOUS EMISSIONS FOR ANTENNA PORTS SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK LOW BAND CHANNEL 1 LINK PORT

EUT: GL1902C S/N129010001001 GSM modulation ON



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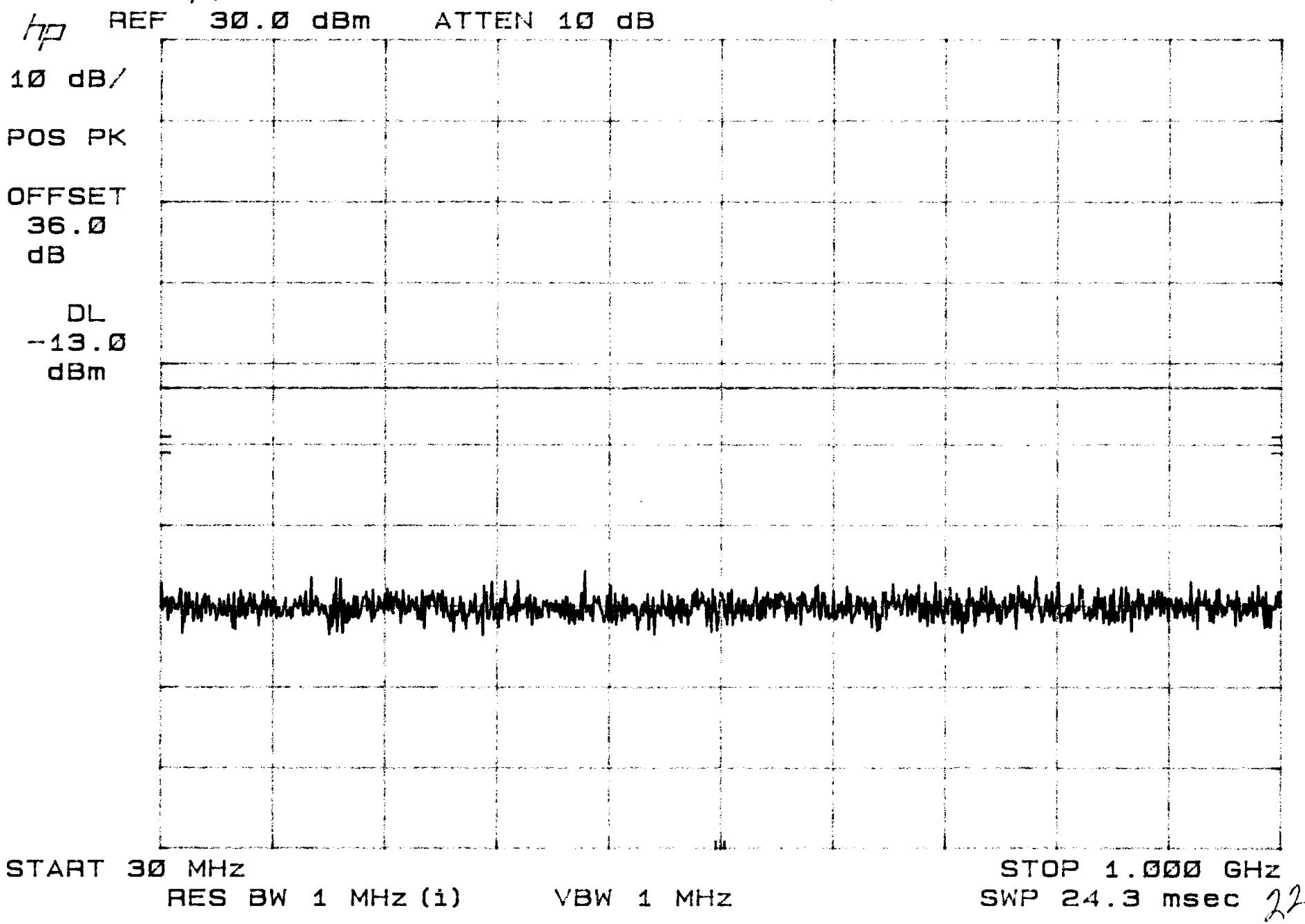
7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORT'S SPECIFICATION: FCC Part 2. Par. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK Mid BAND CHANNEL 2 LINK PORT

EUT: GL1902C S/N 1290100100 1 GSM modulation ON

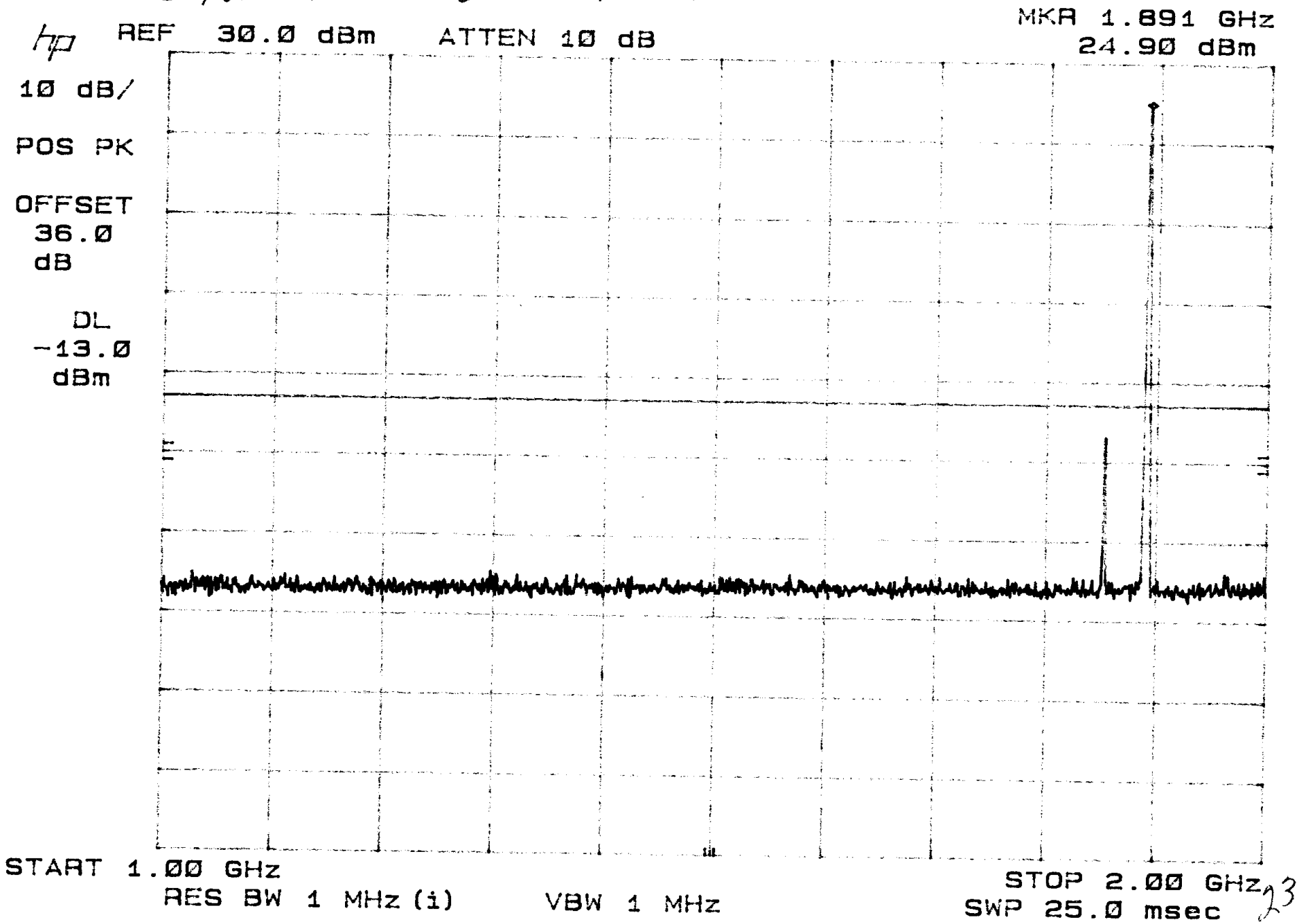


22

7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Par. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK MIDBAND CHANNEL 2

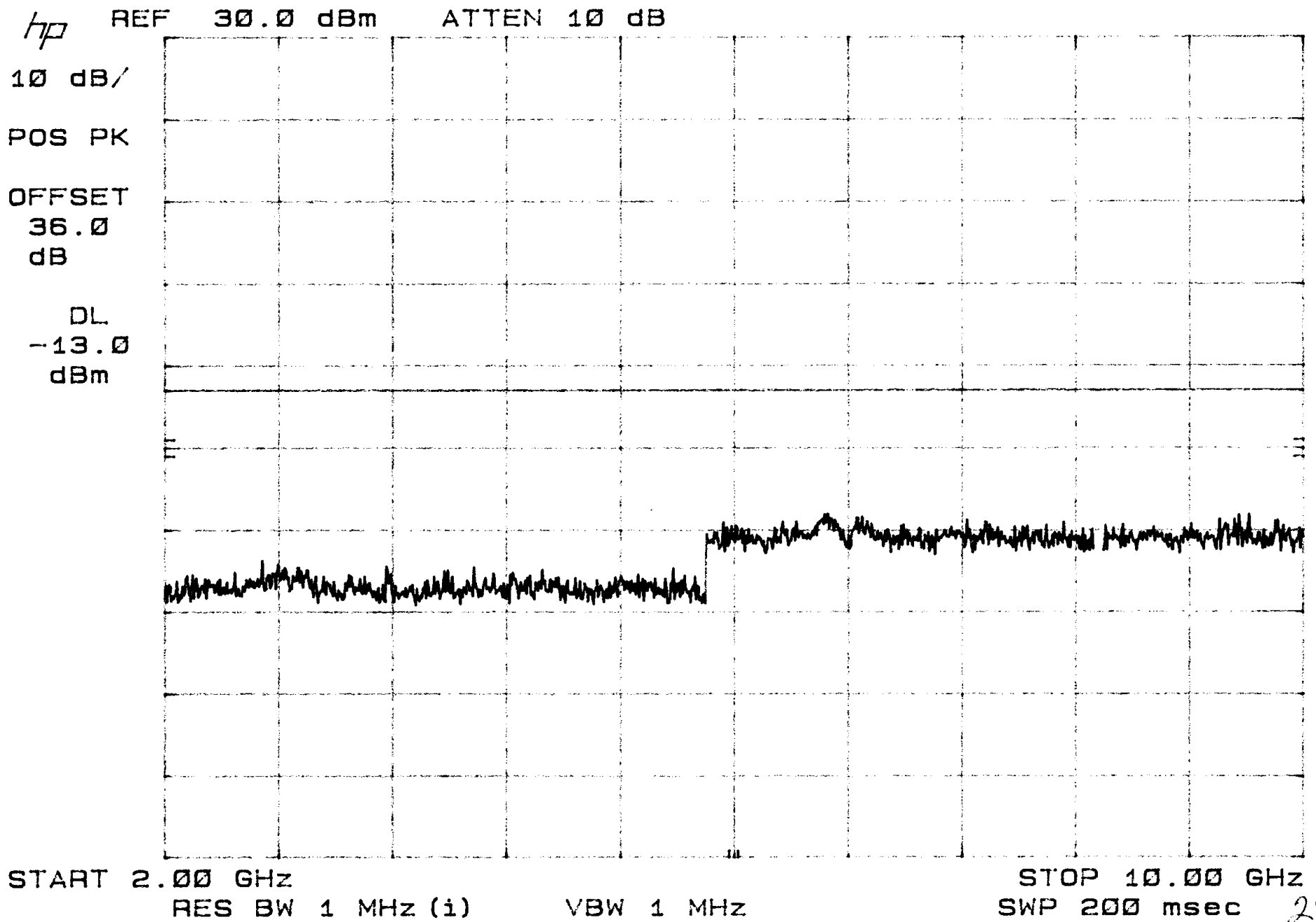
EUT: GL1902C S/N 129010010001 GSM MOD C1



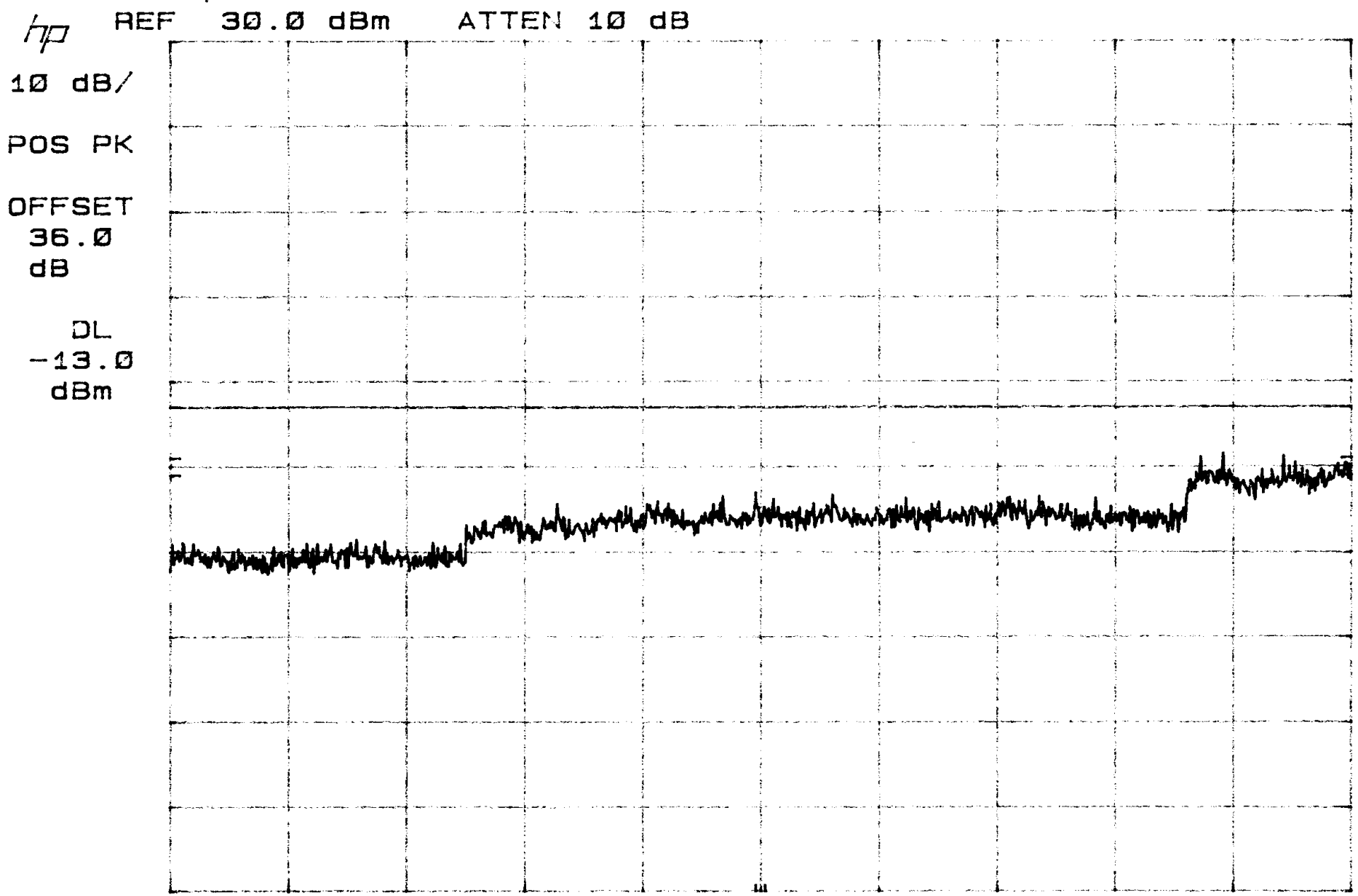
7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORT'S SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK Mid Band CHANNEL 2 LINK PORT

EUT: GL1902C S/N129010010001 GSM modulation ON



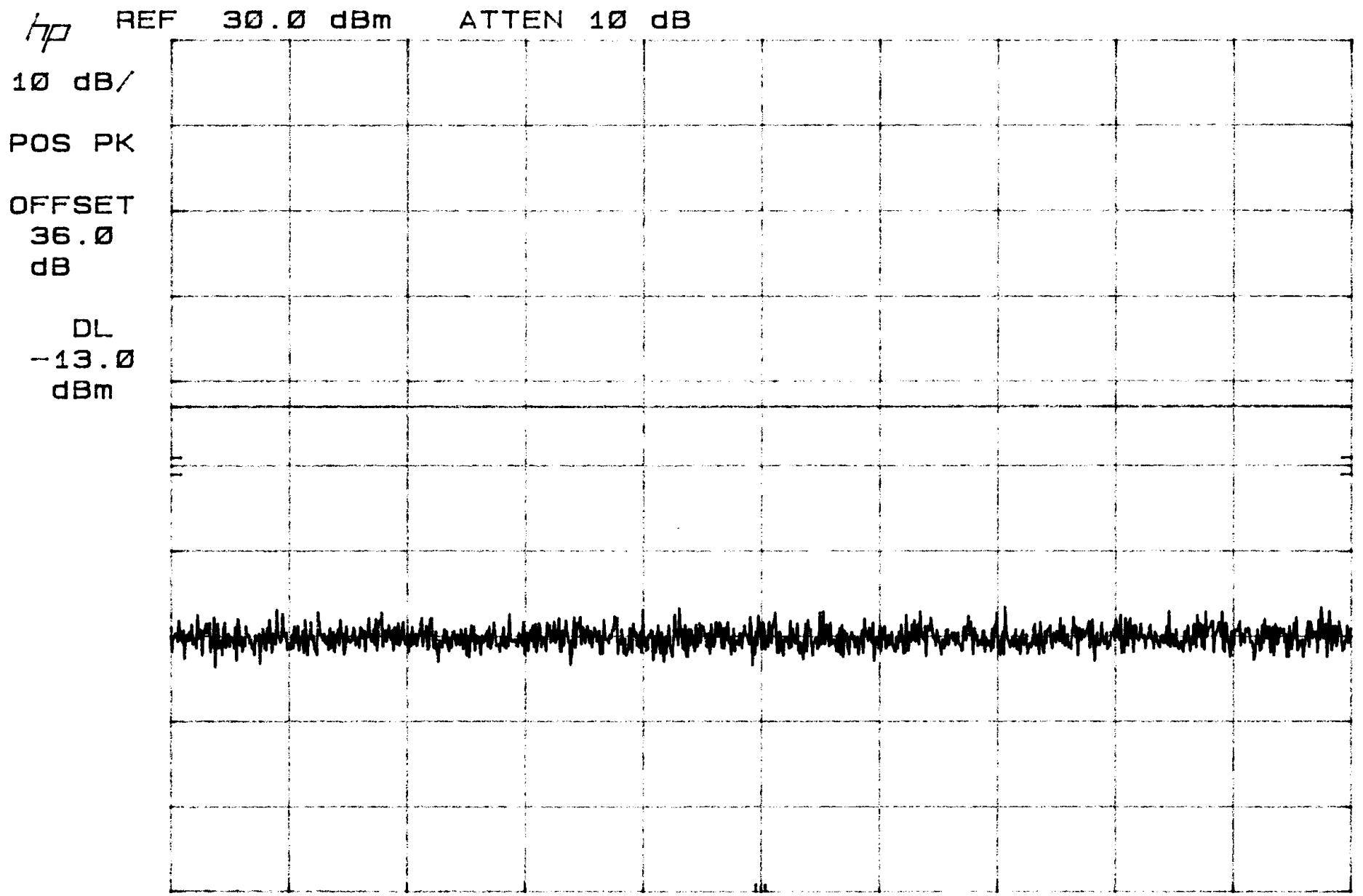
7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Par. 2.1051
Part 24, Para 24.238
CLIENT: LITTLEFEET, INC. Note: UPLINK Mid BAND CHANNEL 2 LINK PORT
EUT: GL1902C S/N 129010001001 GSM MOD ON



7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Sec. 2.1051 Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK High Band Channel 2 LINK PORT

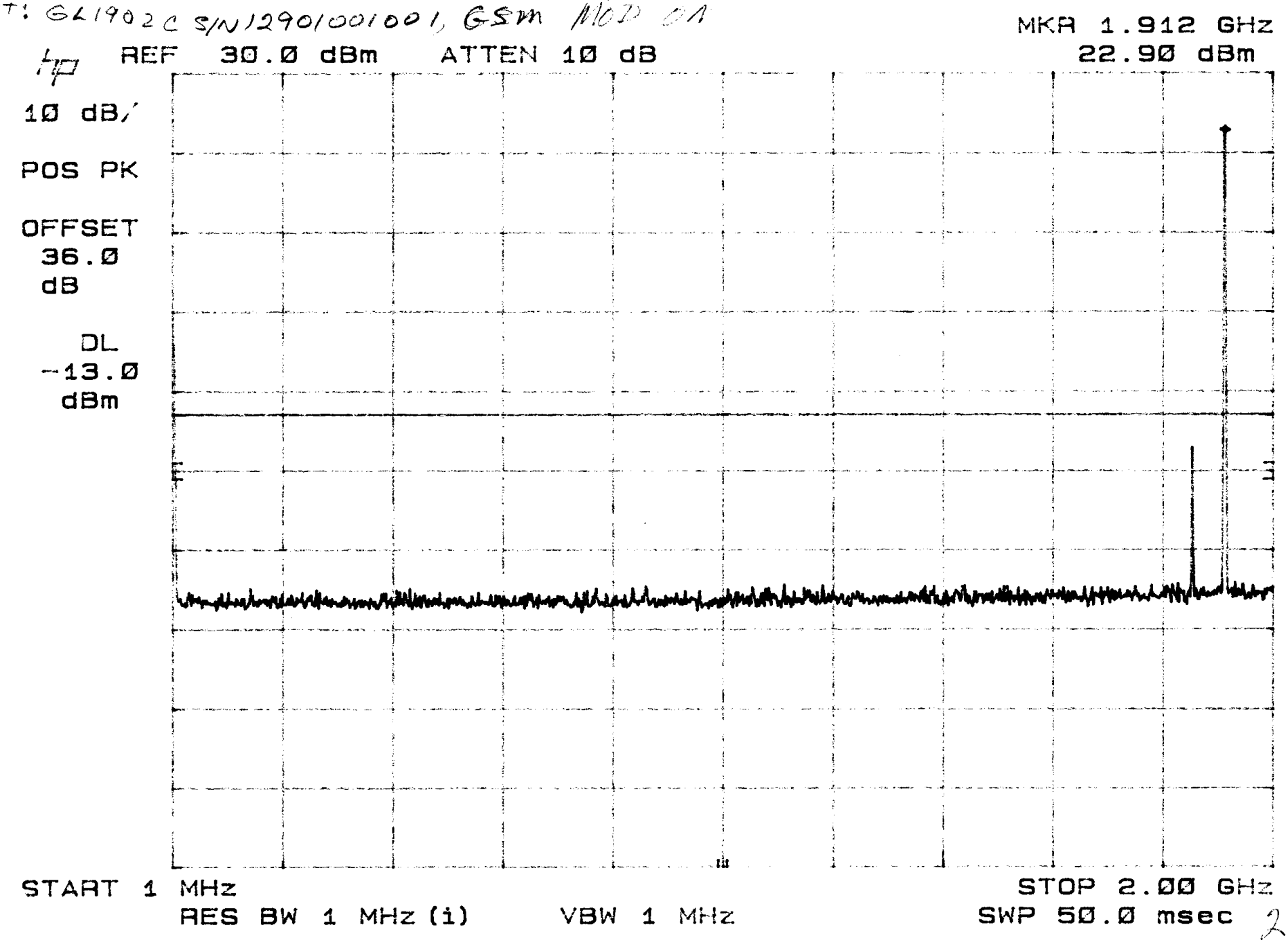
EUT: GL1902C S/N 1290100100 1 GSM MODULATION ON



7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Par. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK High BAND Channel 2

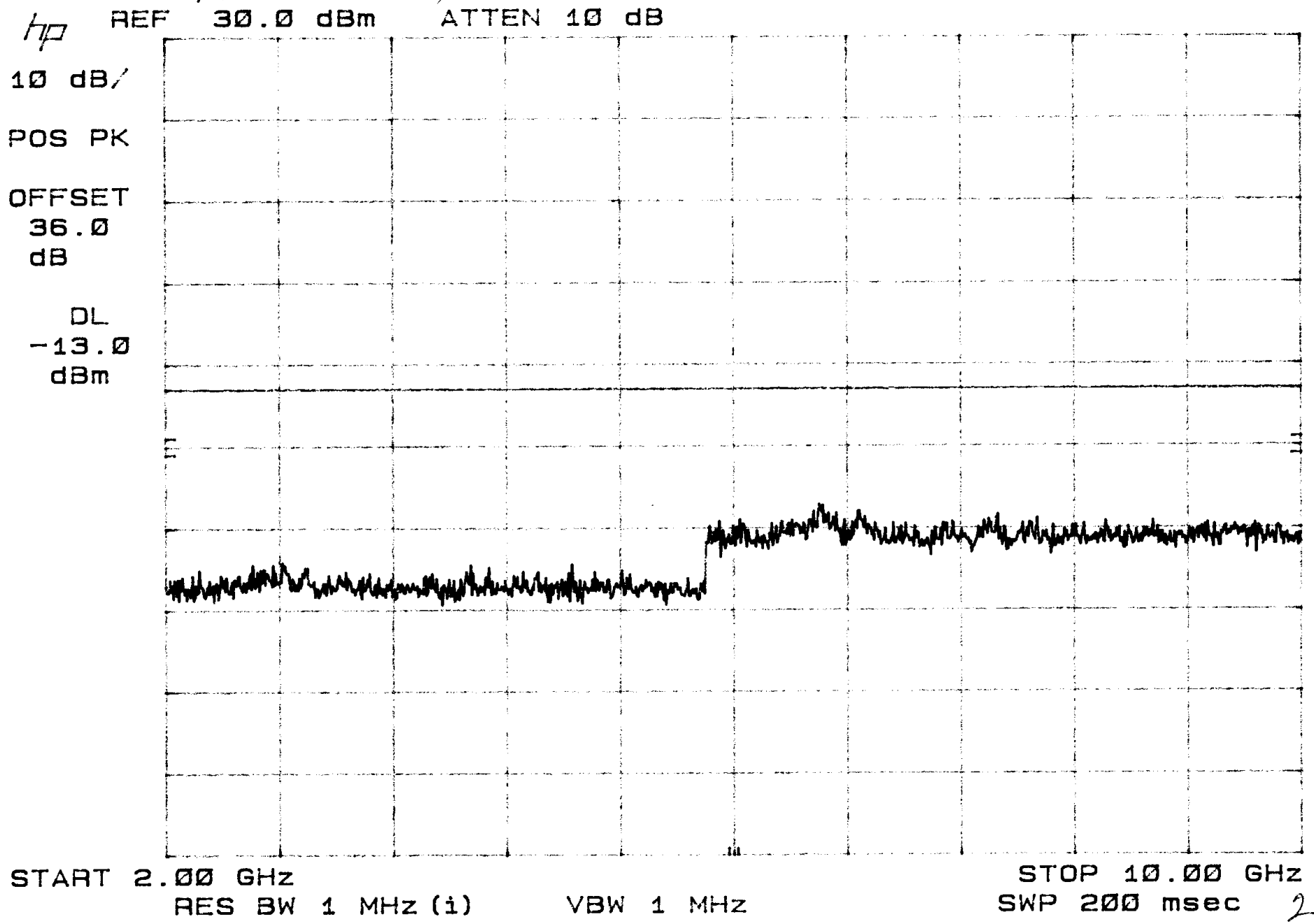
EUT: GL1902C S/N 1290100100 1, GSM MOD 01



7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORT'S SPECIFICATION: FCC Part 2. Para. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK High Band Channel 2 LINK PORT

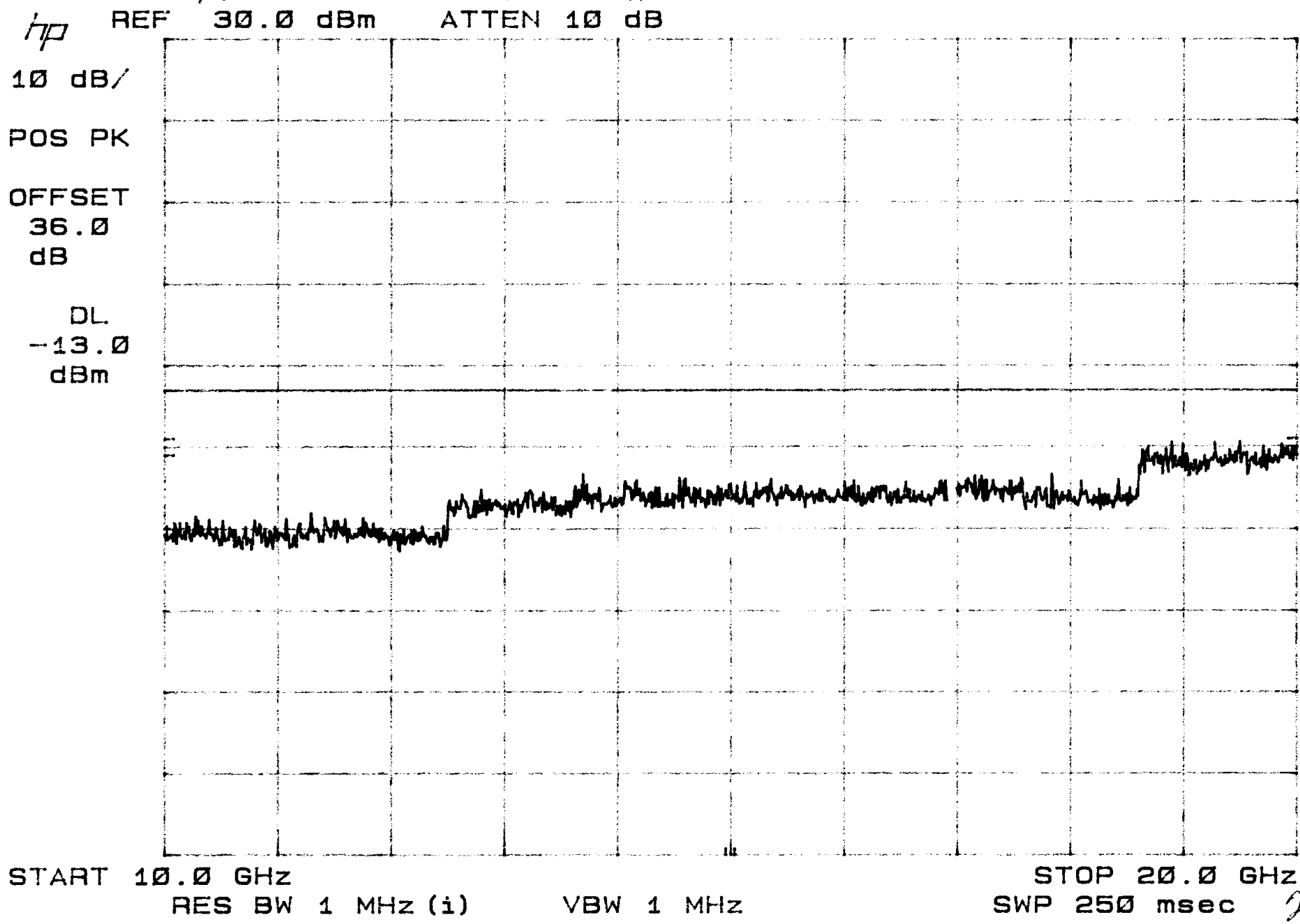
EUT: GL1902C S/N 1290100100 1, GSM modulation ON



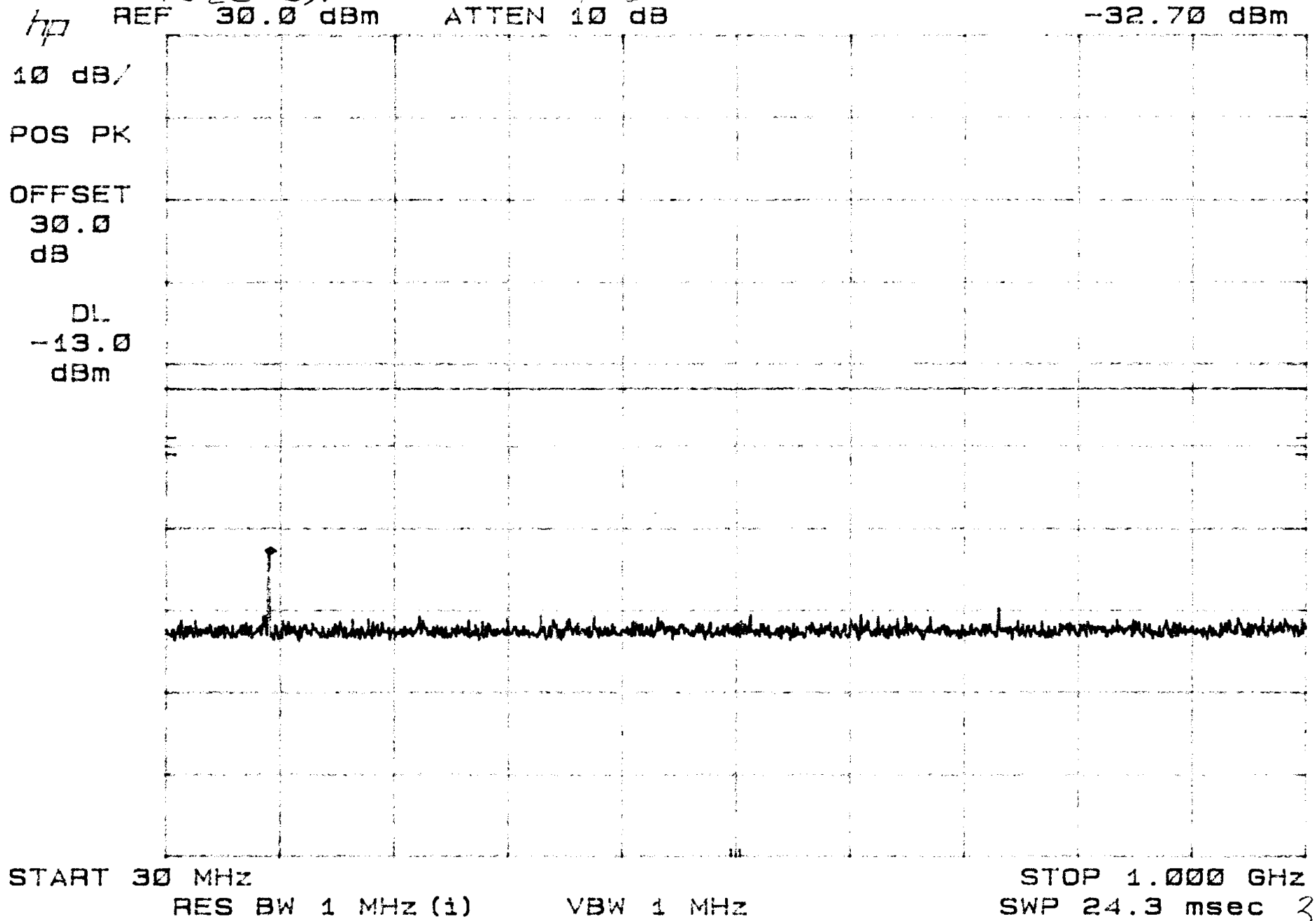
7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK High BAND Channel 2 LINK PORT

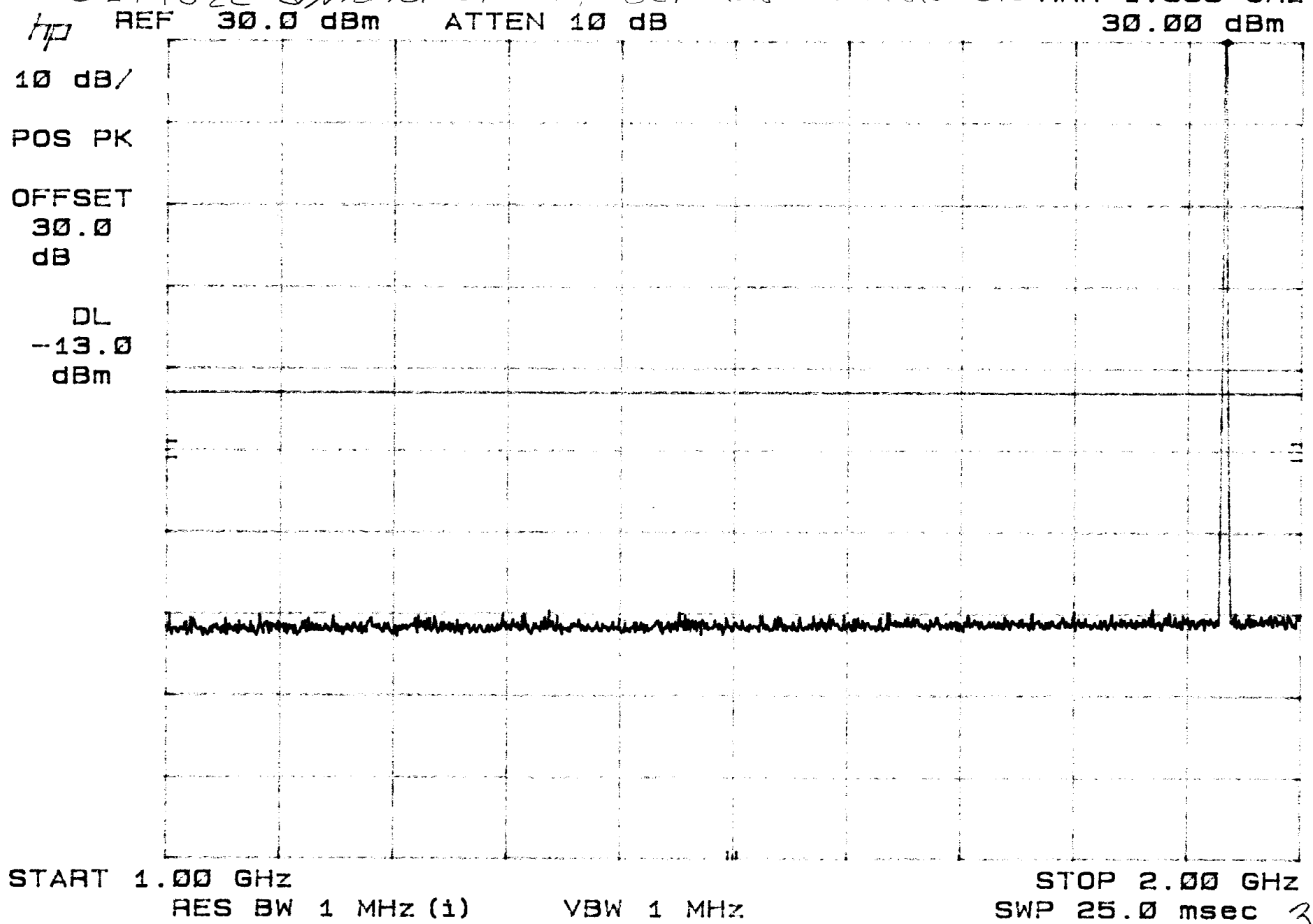
EUT: GL1902C S/N129010001001 GSM 1900 CH



7/26/01 Test: Spurious Emissions + Antenna Ports, Specification: FCC Part 2. PAR 2.1051
Part 24, PAR 24.238
Client: Littlefeet, Inc. Note: Downlink Low Band channel 1
EUT: GL1902C S/N 129010001001 GSM Modulation on



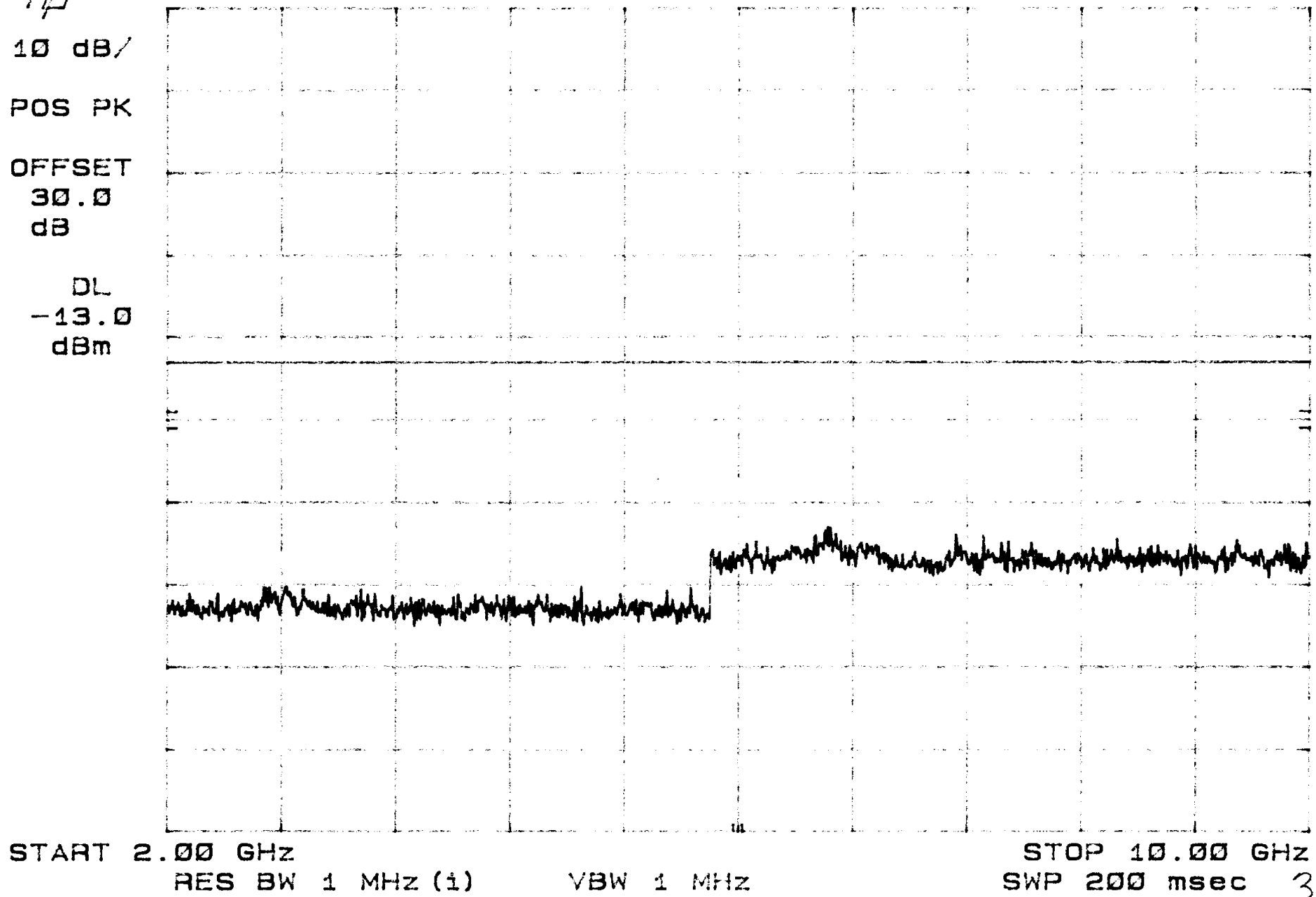
7/26/01 Test: Spurious Emissions + Antenna Ports Specifications: FCC Part 2. Par 2.1051
Part 24, Par 24.238
Client: Littlefeet, Inc. Note: Downlink Low Band channel 1
EUT: GL1902C S/N 1290100/1001, GSM Modulation on



7/26/01 Test: Spurious Emissions + Antenna Ports Specifications: FCC Part 2. Par 2.1051
Part 24, Par 24.238

Client: Littlefeet, Inc. Note: Downlink Low Band channel 1

EUT: GL1902C S/N 1290100/1001, GSM Modulation on

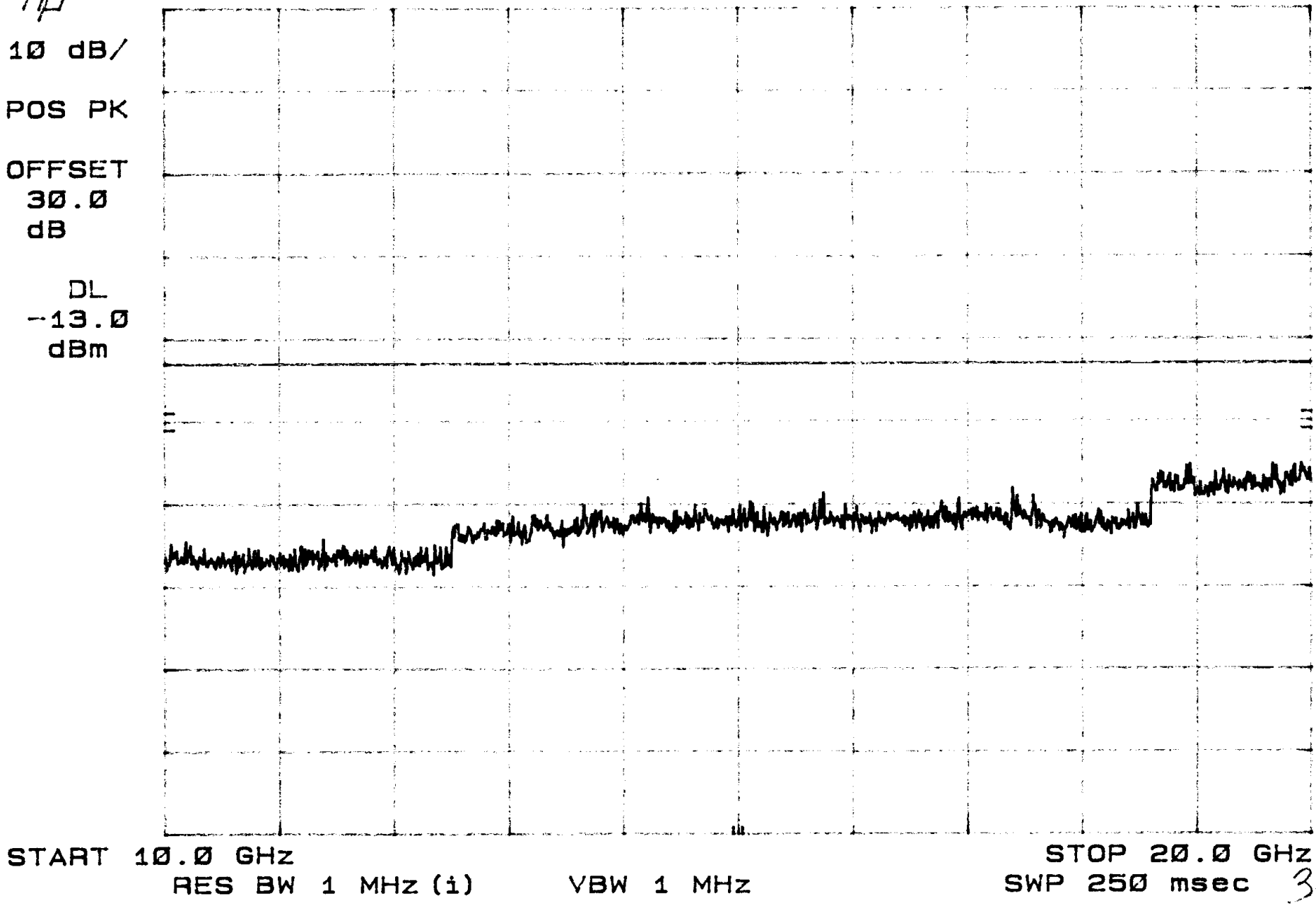


7/26/01

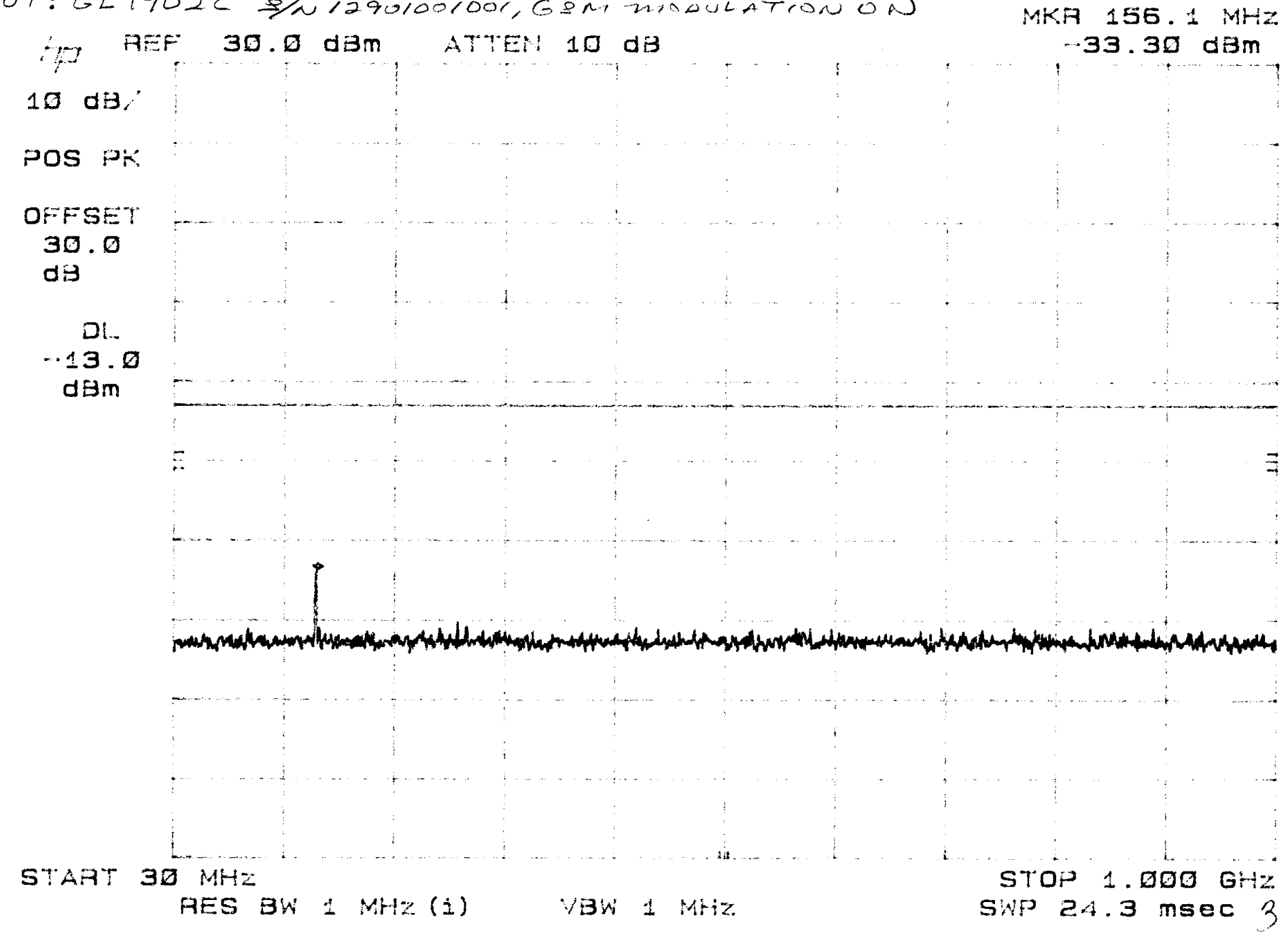
SPURIOUS EMISSIONS + ANTENNA PORTS 2.1051 24.238

DOWNLINK LOW BAND CHANNEL 1

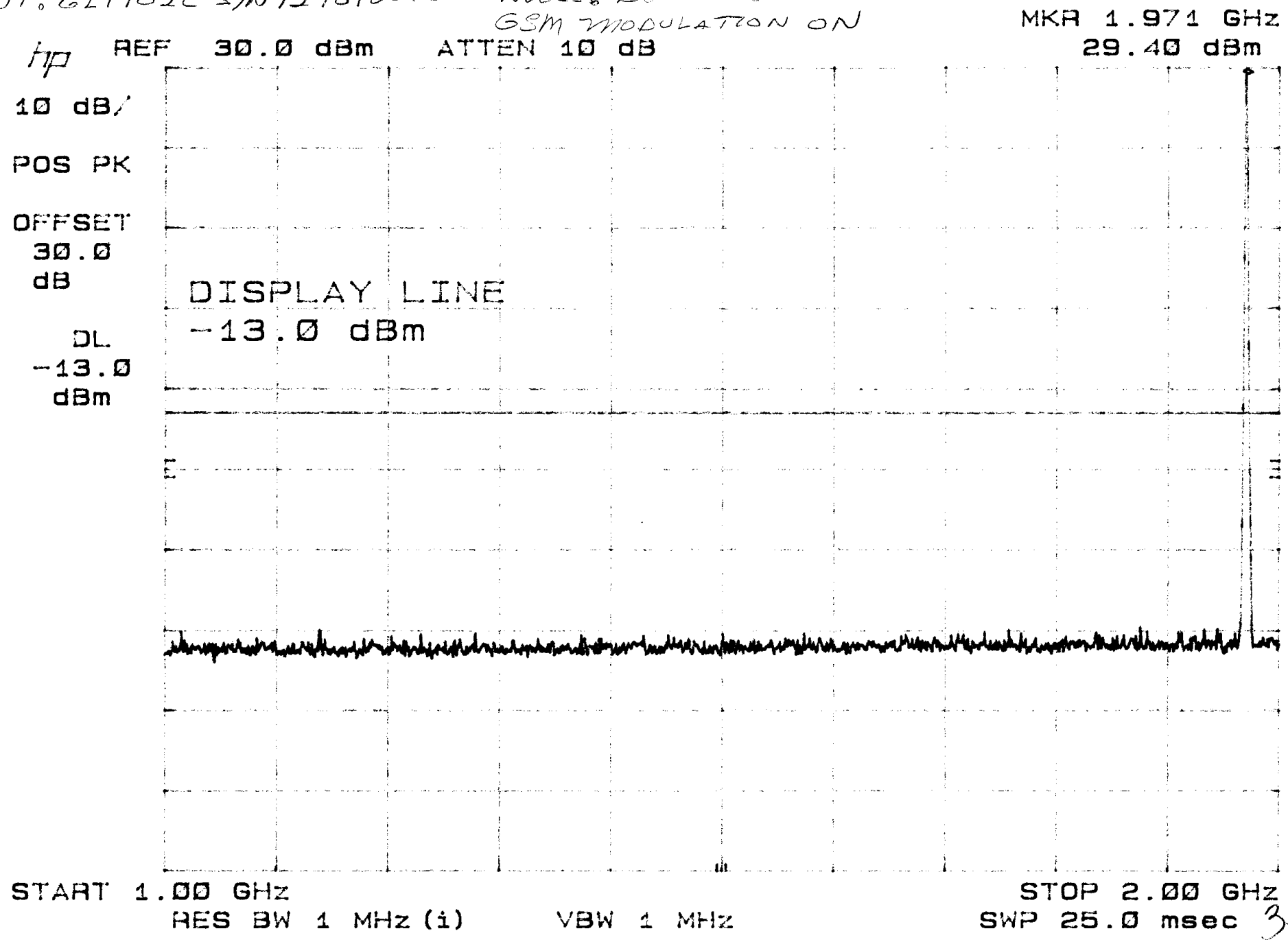
GSM 1/10 D QA



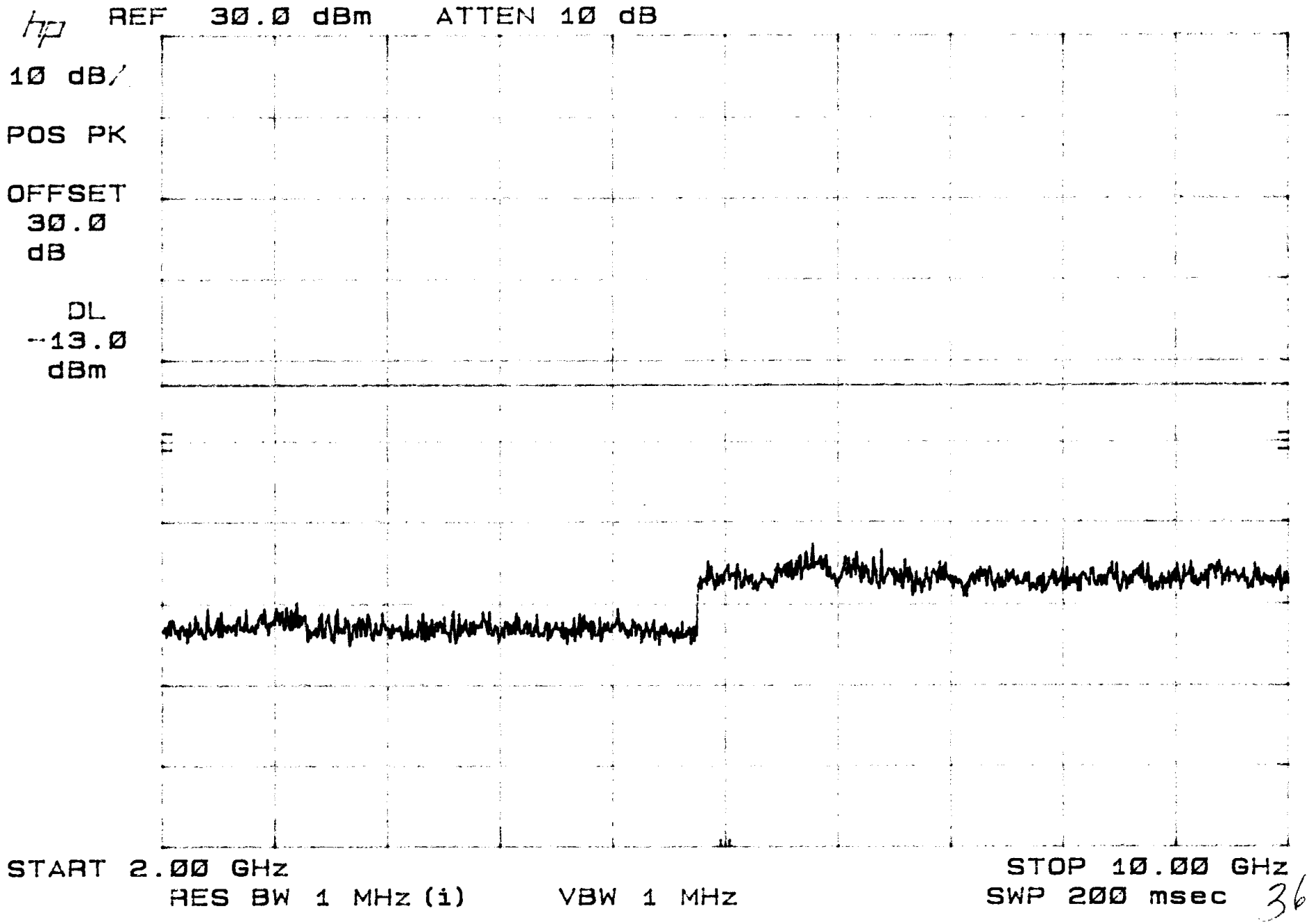
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, Mid BAND, channel 1
EUT: GL1902C S/N 1290100100I, GSM MODULATION ON



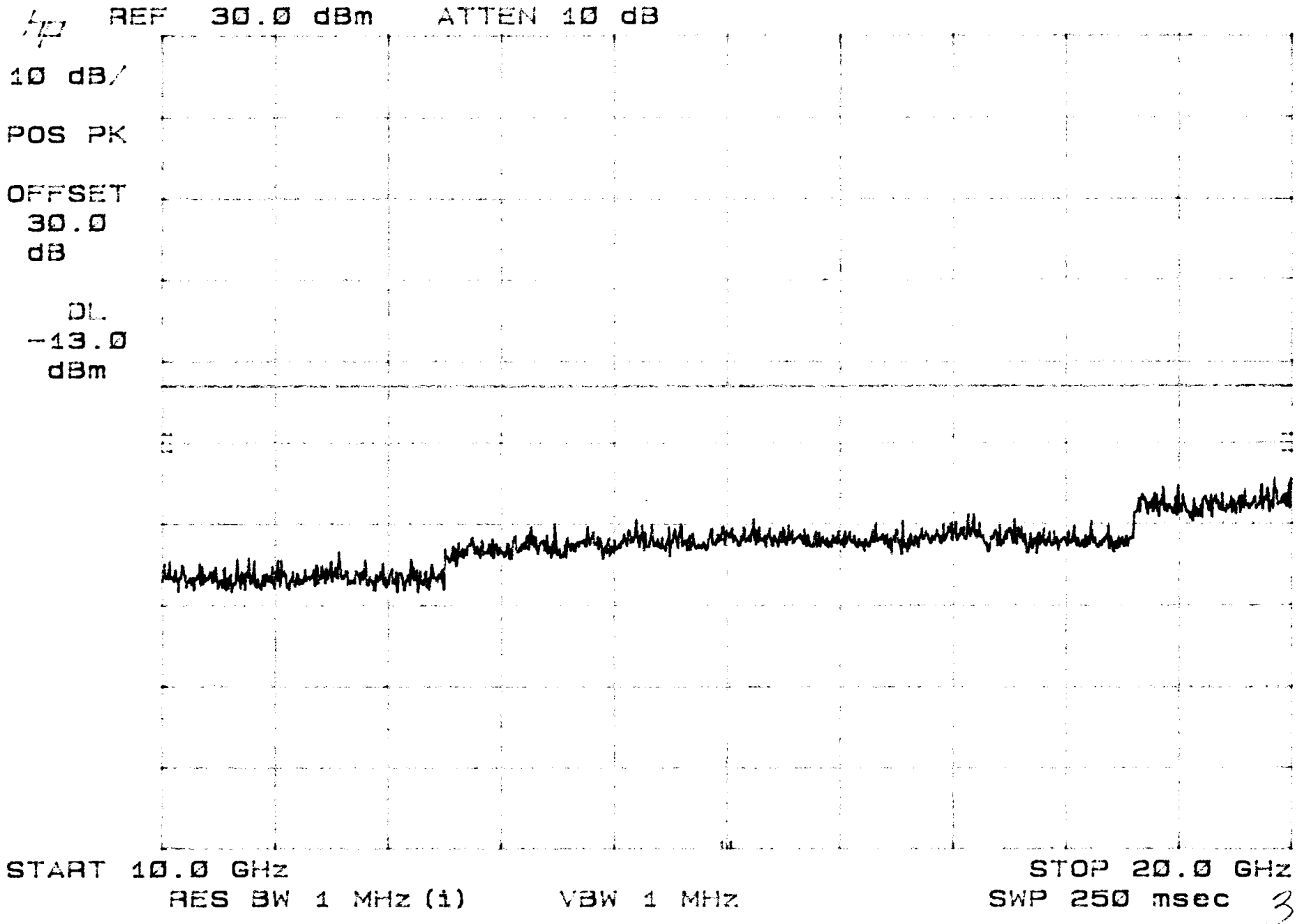
7/26/01 TEST: Occupied Bandwidth / Output Power, SPEC: FCC PART 2.1046
FCC PART 2.1049
CLIENT: LITTLE FEET, INC.
EUT: GL1902C S/N 1290100100I Notes: Downlink, Mid Band channel 1
GSM MODULATION ON



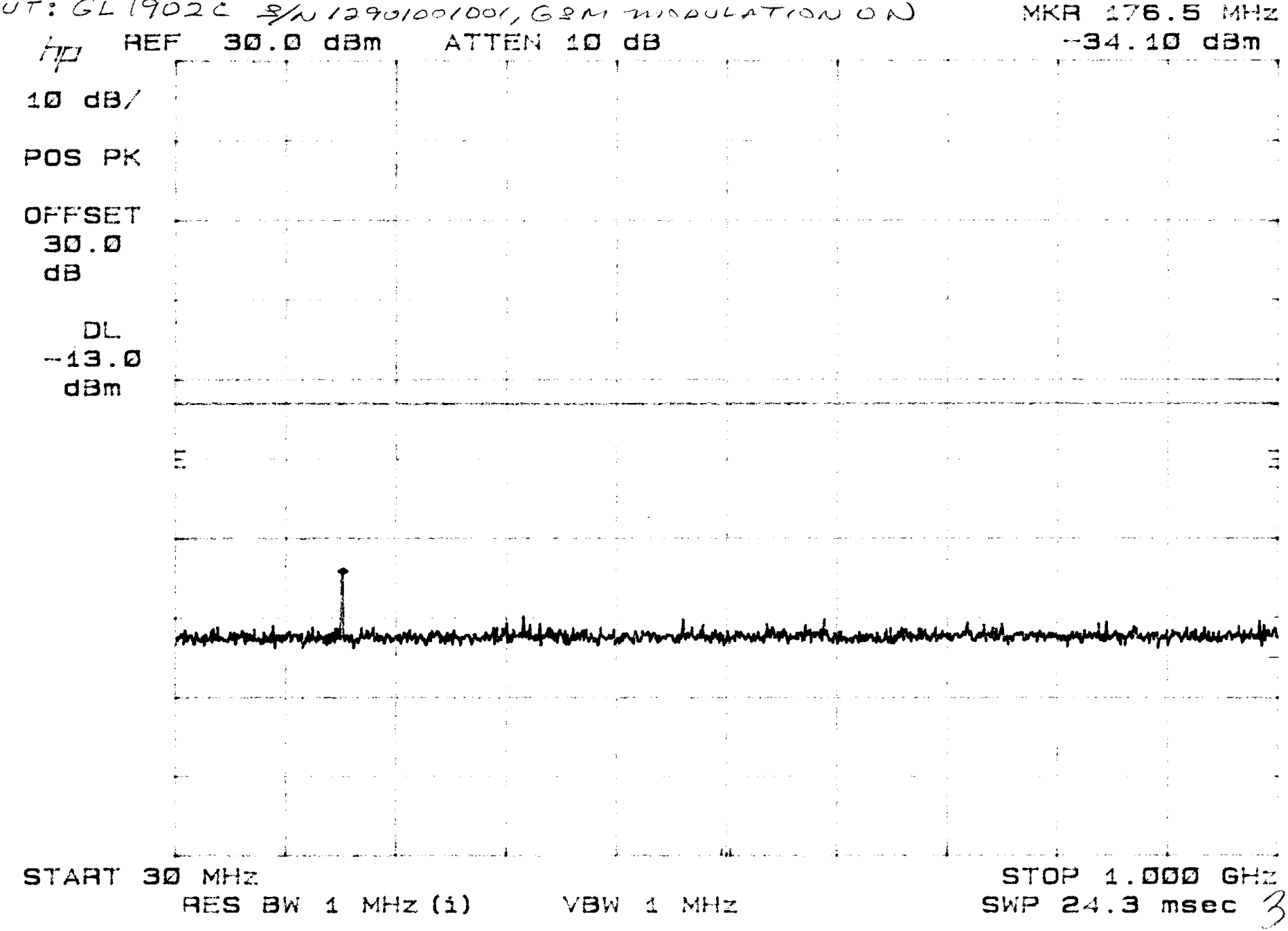
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, MID BAND, CHANNEL 1
EUT: GL1902C S/N 129010001001, GSM MODULATION ON



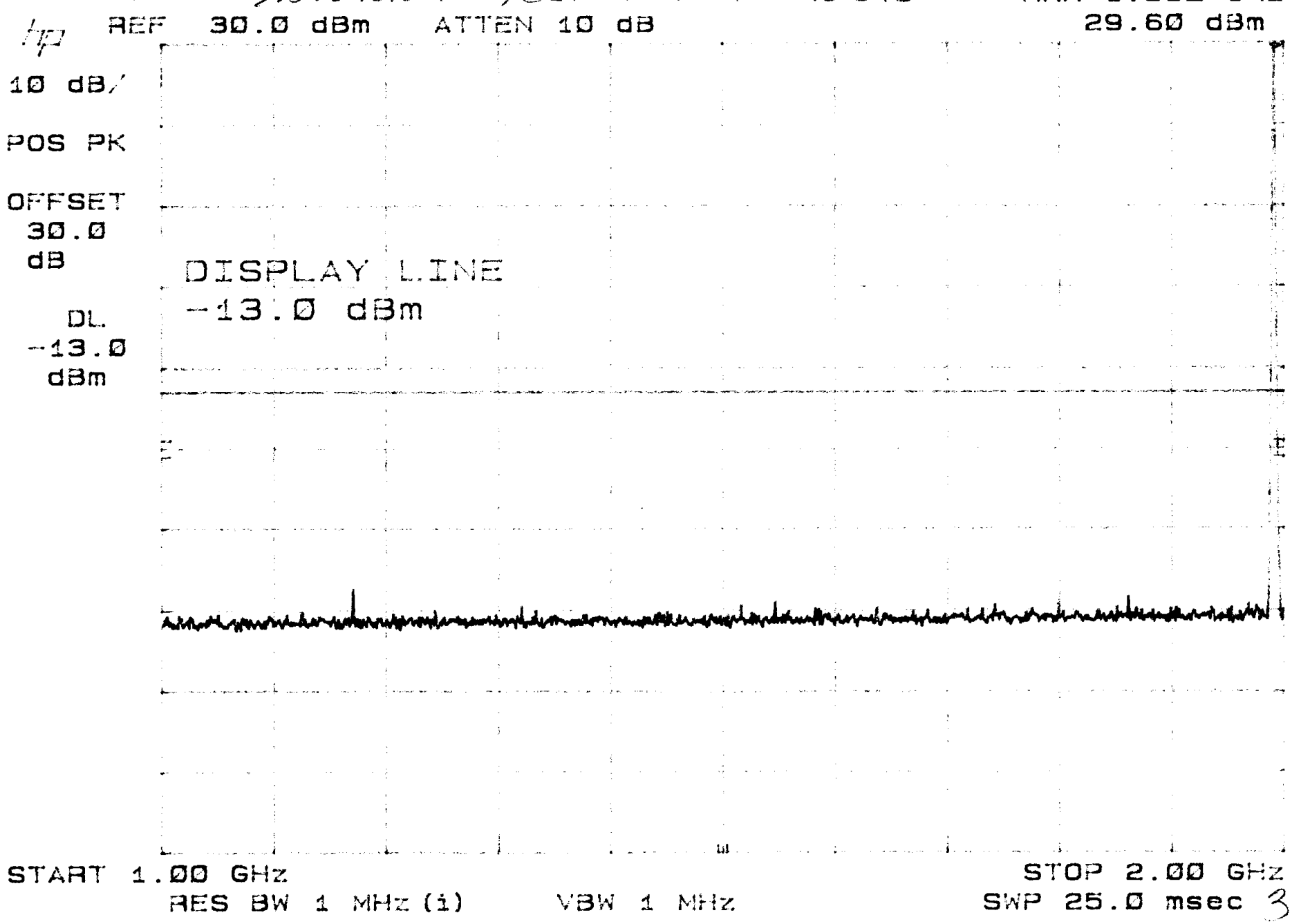
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, MID BAND, CHANNEL 1
EUT: GL1902C S/N 129010010001, GSM MODULATION ON



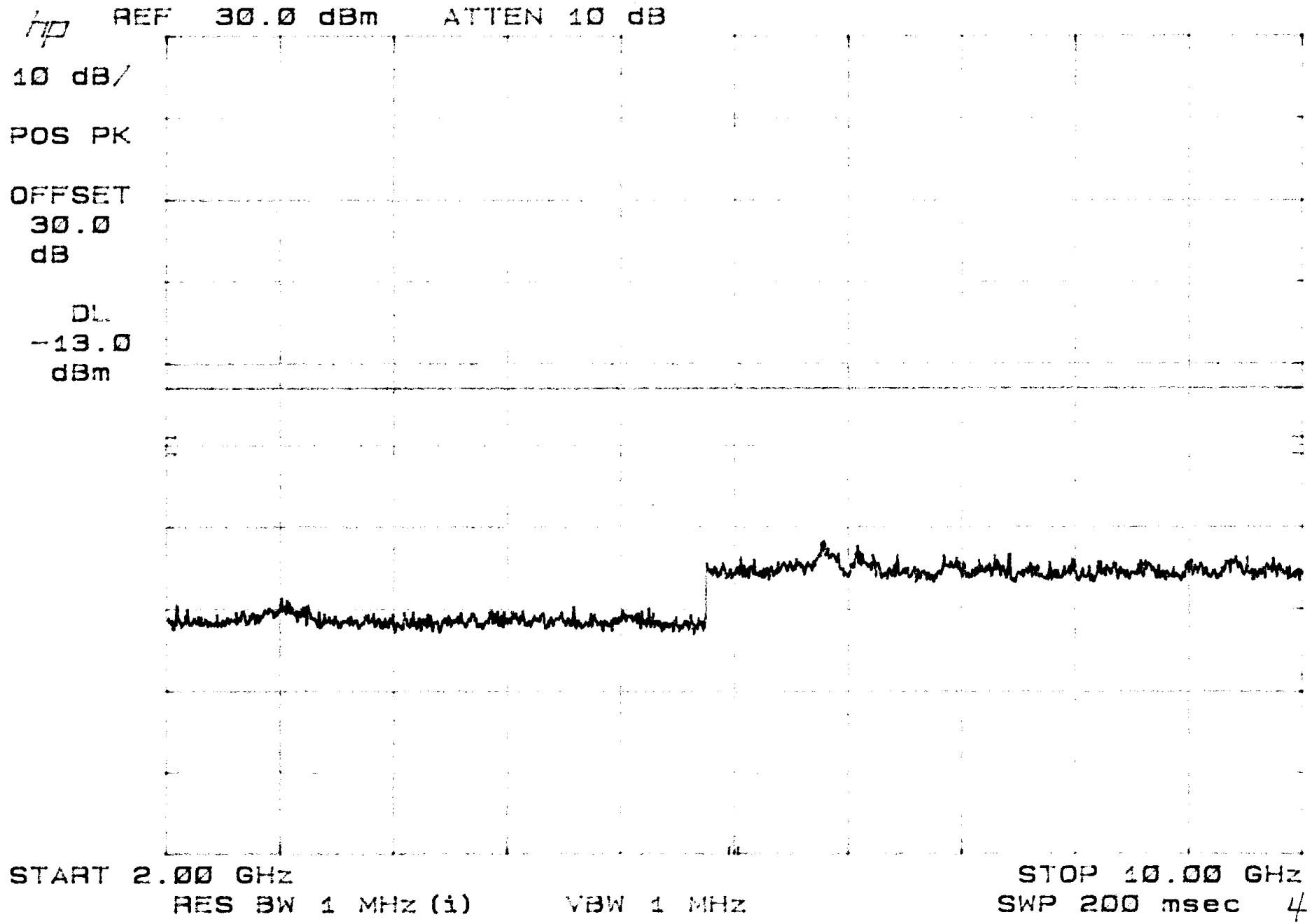
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, High BAND, channel 2
EUT: GL 1902C S/N 129010001001, GSM MODULATION ON



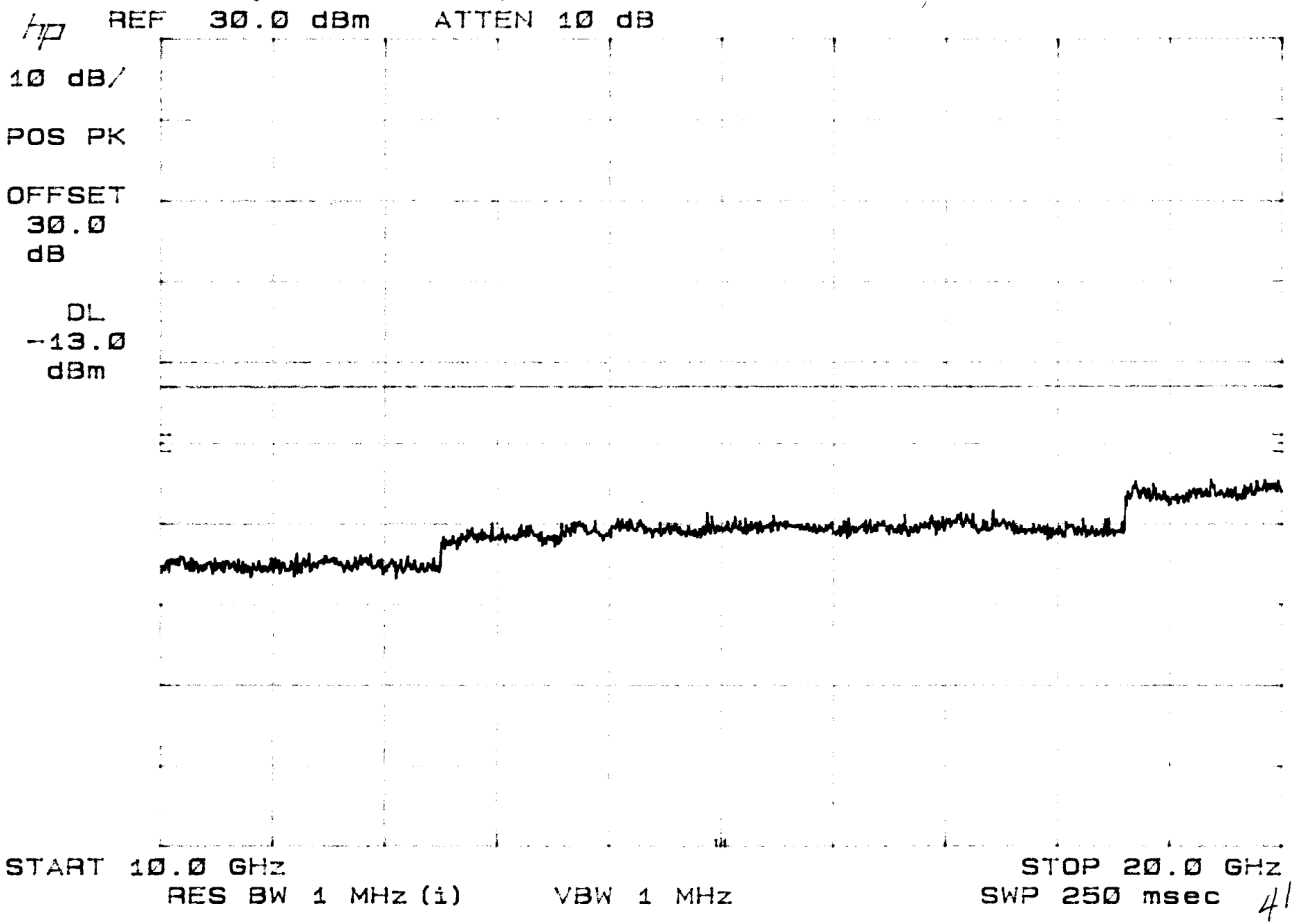
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, High BAND, channel 2
EUT: GL1902C S/N 129010001001, GSM MODULATION ON



7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, High BAND, channel 2
EUT: GL1902C S/N 129010001001, GSM MODULATION ON.



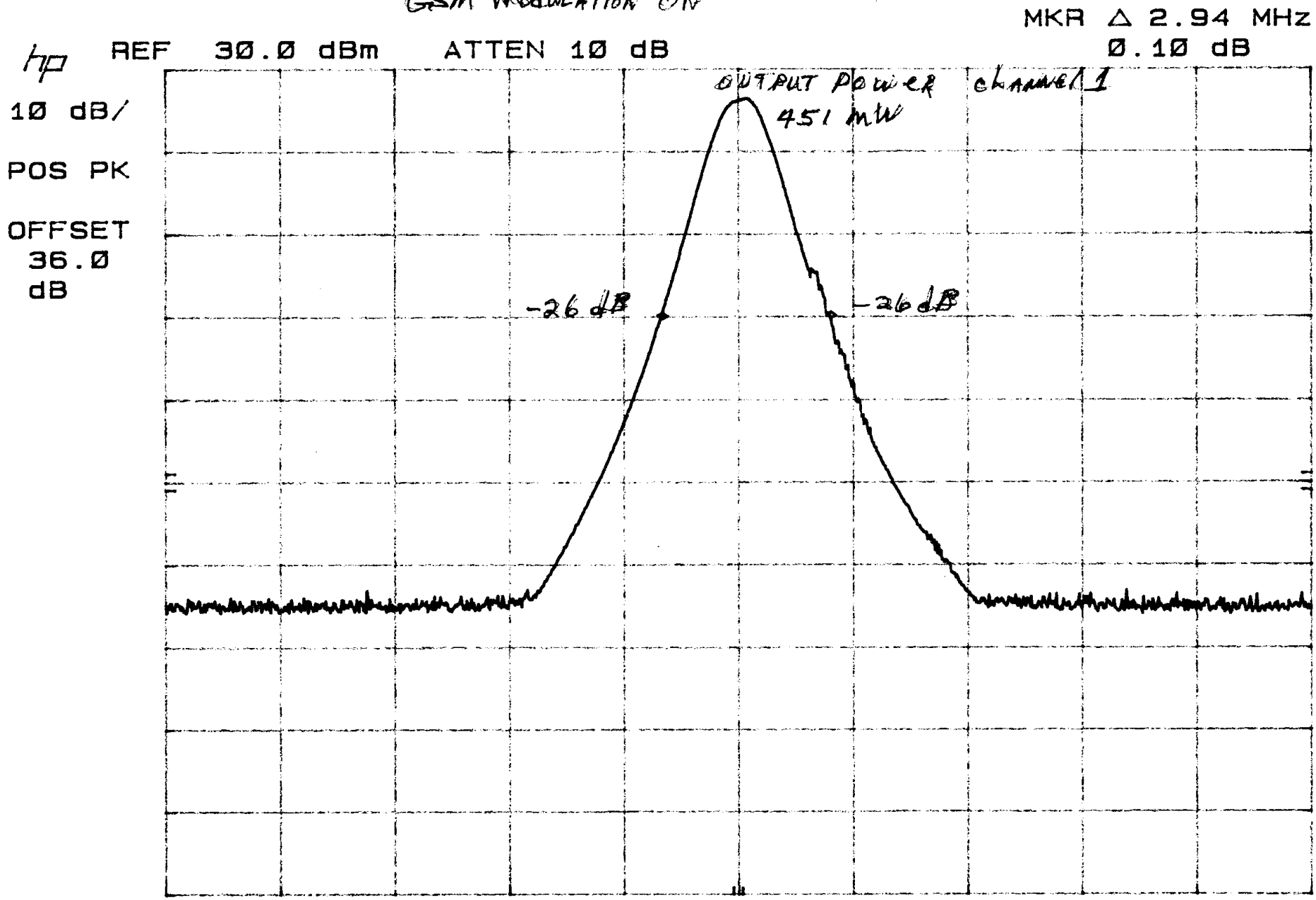
7/26/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS, SPEC: FCC PART 2, PAR. 2.1051
FCC PART 24, PAR 24.238
CLIENT: LITTLEFEET, INC. NOTE: DOWNLINK, High BAND, channel 2
EUT: GL 1902C S/N 129010001001, GSM MODULATION ON,



2/25/01

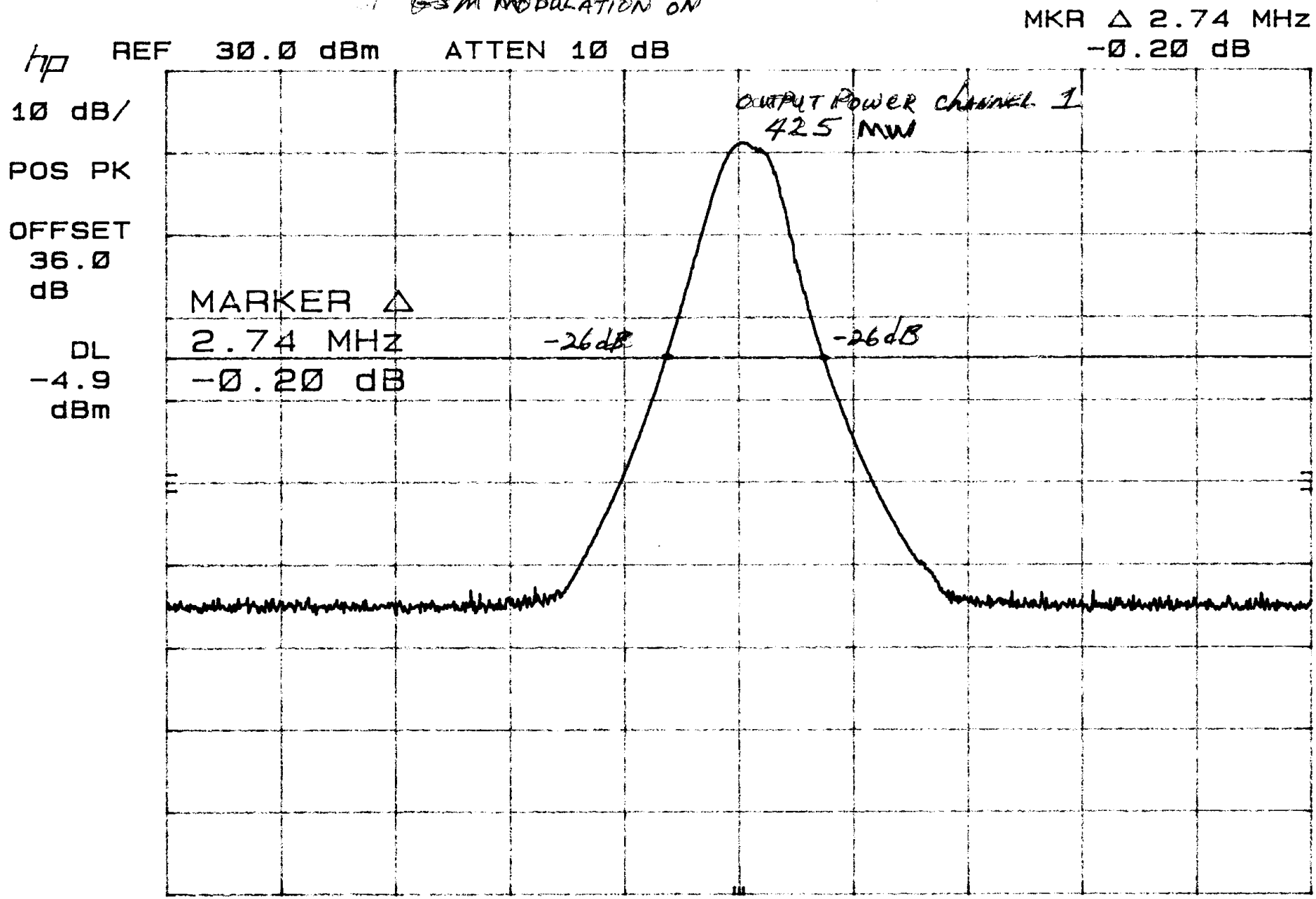
Occupied Bandwidth
UPLINK LOW BAND
GSM MODULATION ON

2.1046



7/25/01

Occupied Bandwidth
UPLINK Mid BAND
GSM MODULATION ON

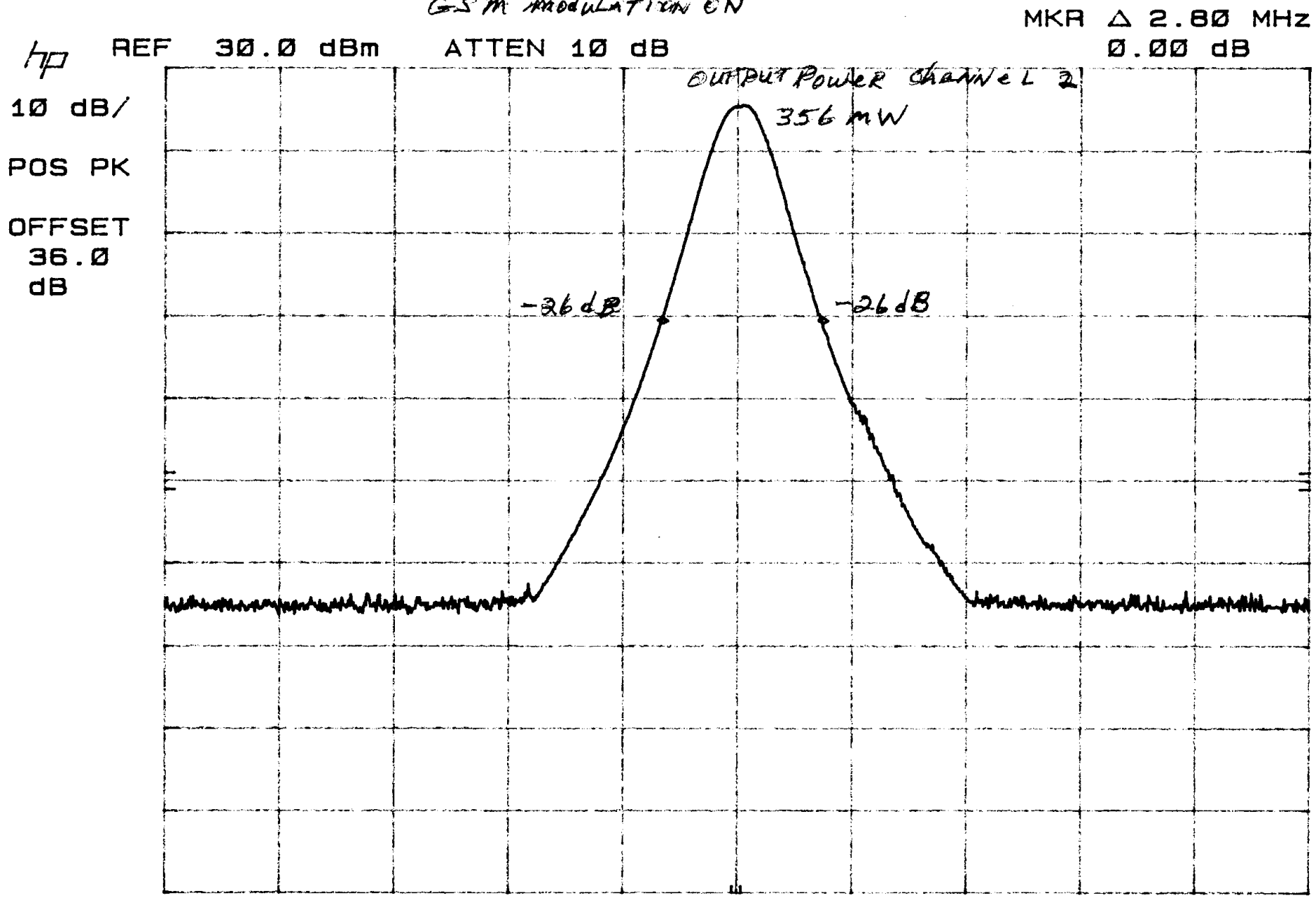


7/25/01

Occupied Bandwidth

UPLINK HIGH BAND

GSM modulation ON

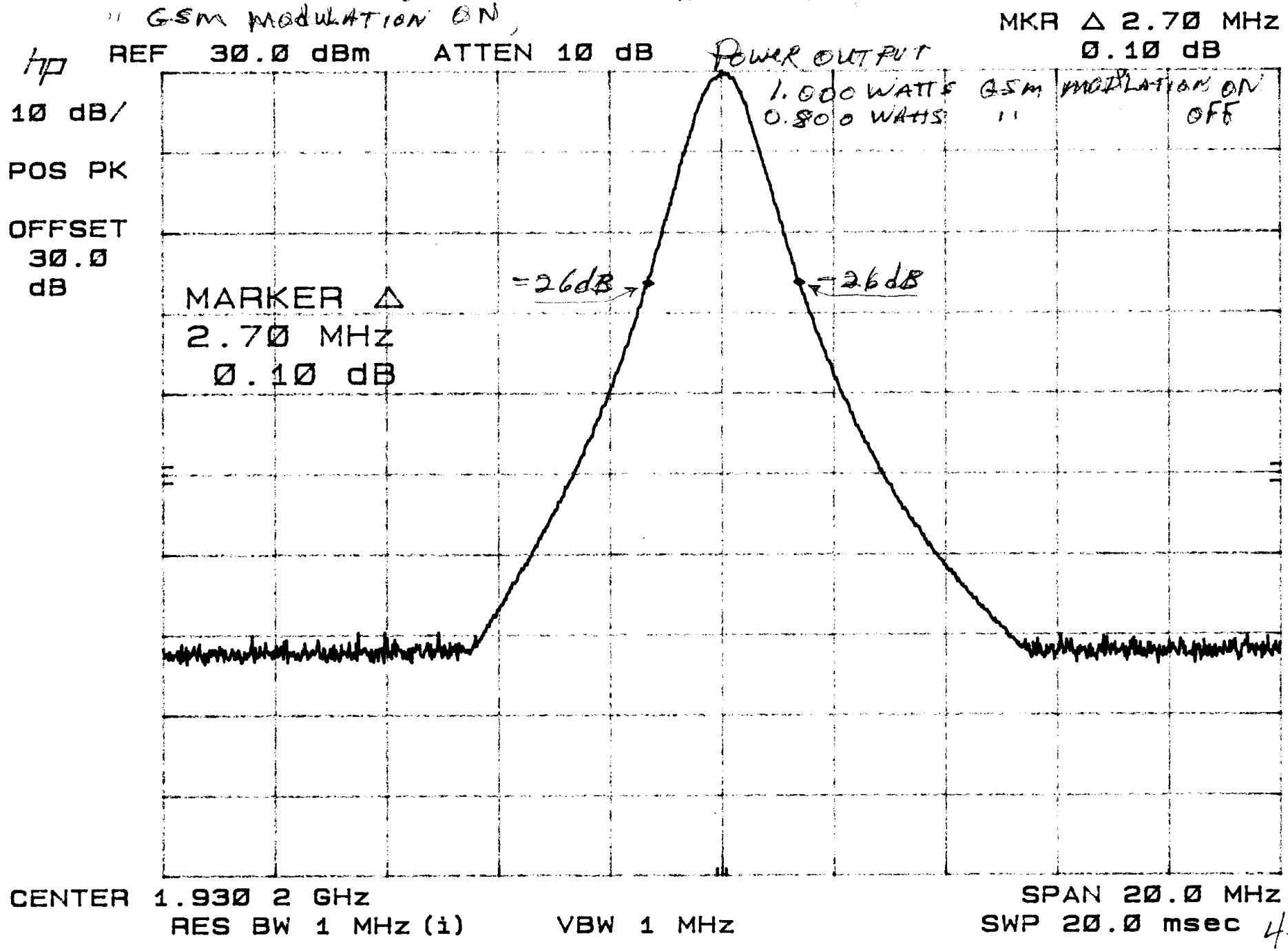


7/26/01

OCCUPIED BANDWIDTH/OUTPUT POWER

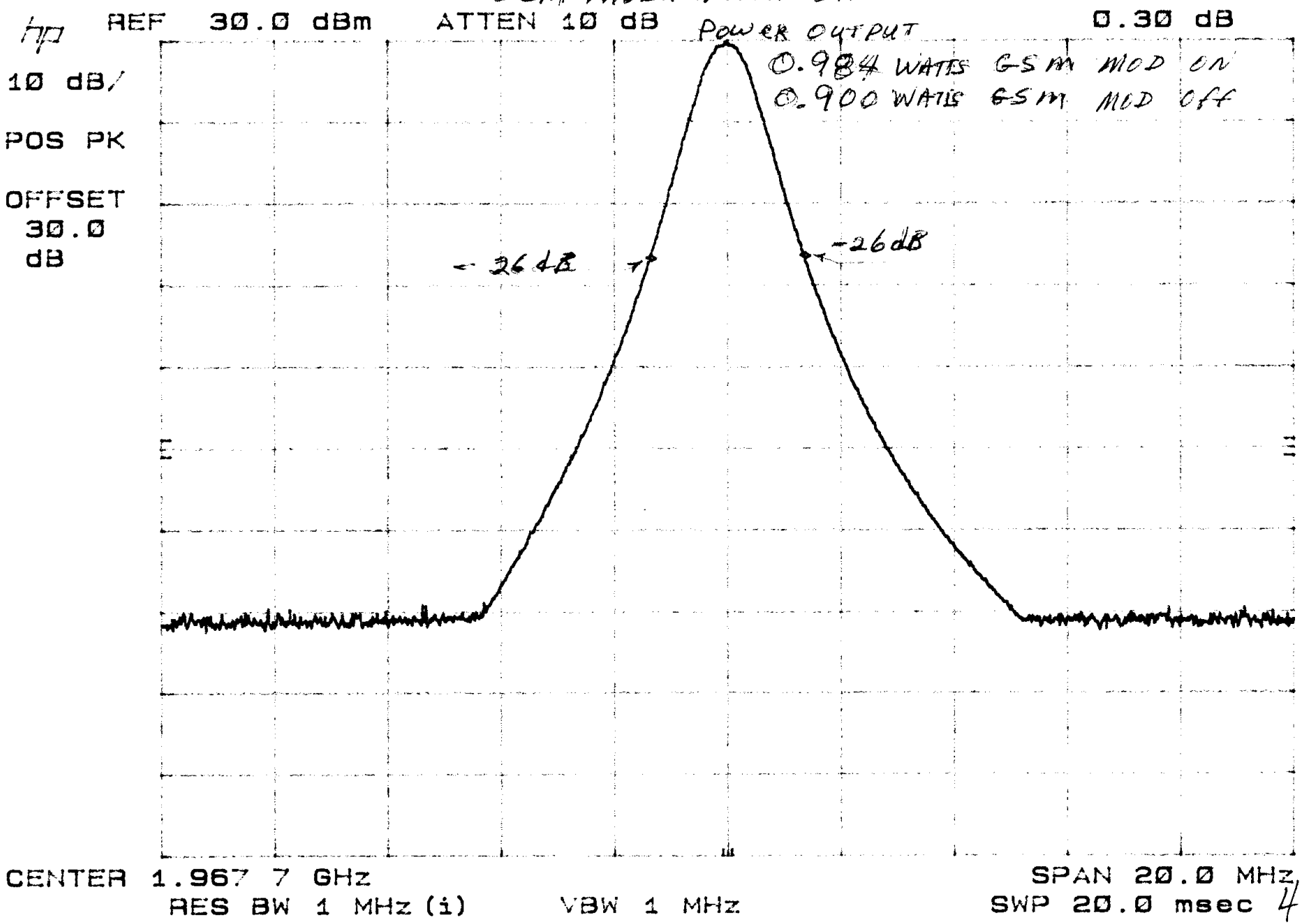
2.1046
2.1049

DOWNLINK LOW BAND CHANNEL 1
GSM MODULATION ON



45

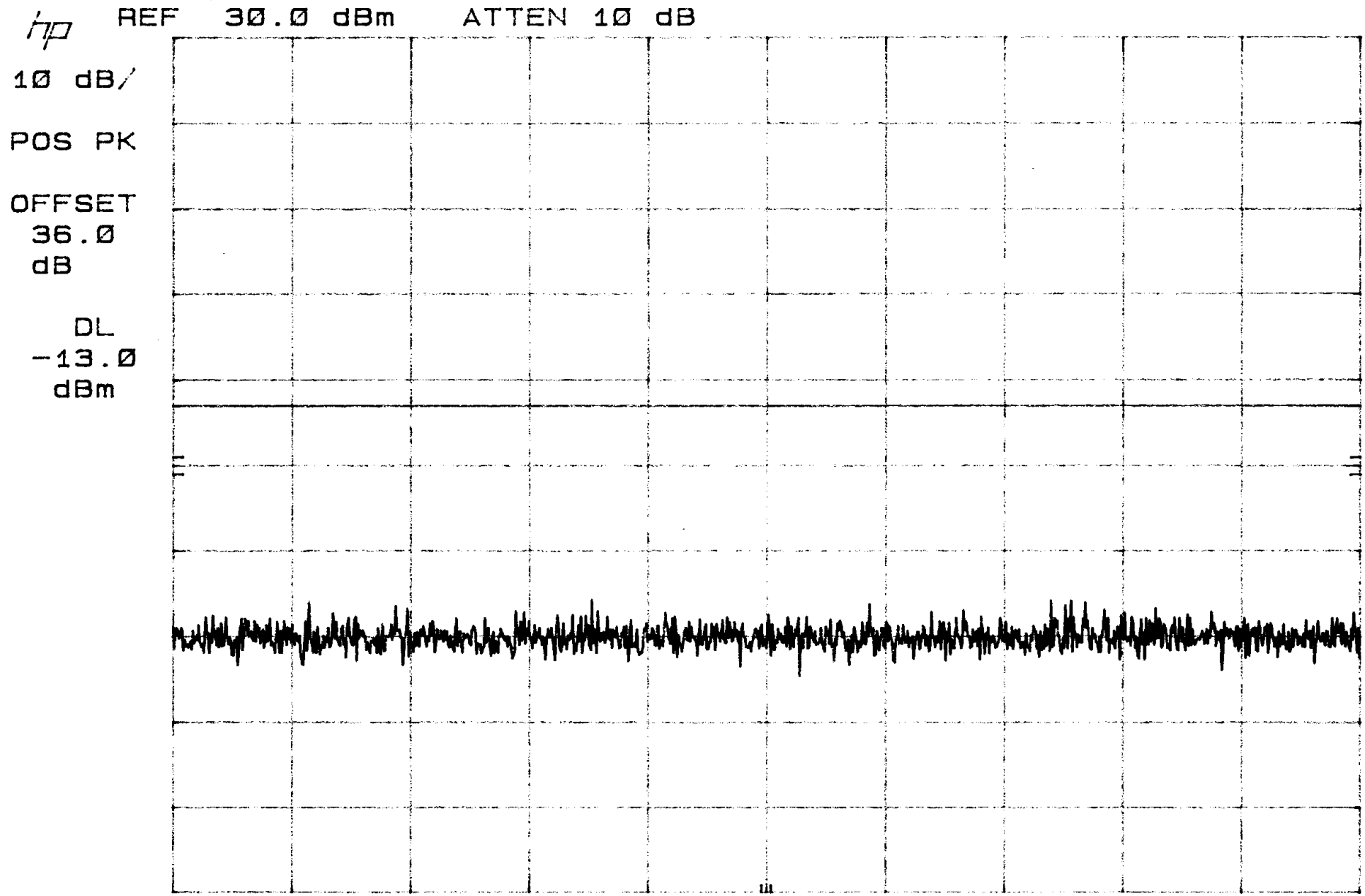
7/26/01 TEST: Occupied Bandwidth / Output Power, SPEC: FCC PART 2.1046
FCC PART 2.1049
CLIENT: LITTLE FEET, INC.
EUT: GL1902C S/N 1290100100/ Notes: DOWNLINK, Mid Band Channel 1
GSM MODULATION ON



7/25/01 TEST: SPURIOUS EMISSIONS + ANTENNA PORTS SPECIFICATION: FCC Part 2. Sec. 2.1051
Part 24, Para 24.238

CLIENT: LITTLEFEET, INC. Note: UPLINK LOW CHANNEL 1 LINK PORT

EUT: GL1902C S/N 1290100010001 GSM mod ON

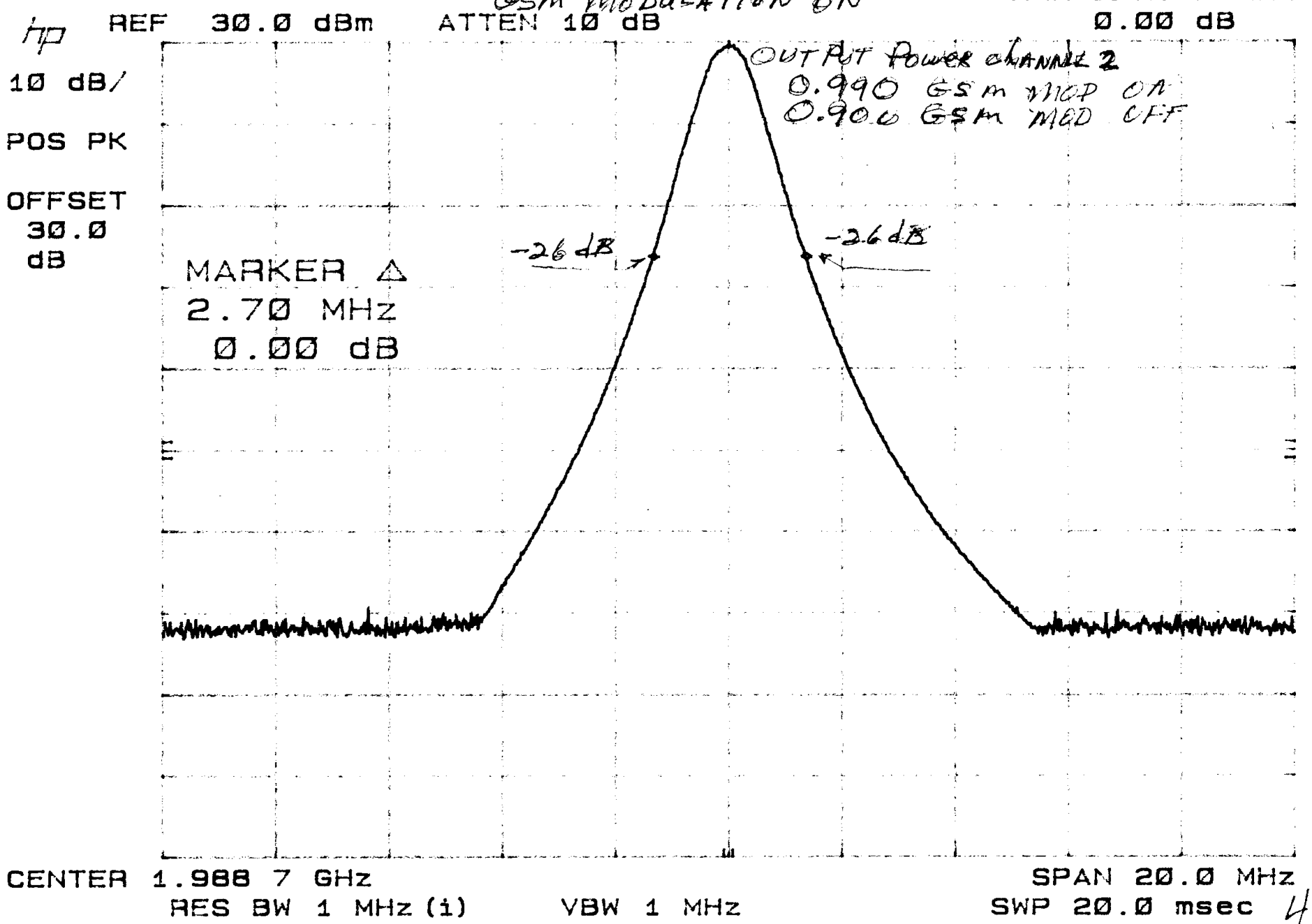


7/26/01 — Occupied Bandwidth / Output Power

2.1046
2.1049

Downlink High Band channel 2

GSM Modulation ON



FREQUENCY STABILITY

VOLTAGE VARIATION at ROOM TEMPERATURE

Test Report #: SC-105539 Test Area: TR2

Test Method: FCC Date: 7/26/01

FCC PART 2.1055(d)(1) EUT POWER:

EUT Model #: GL1902C ☐ 230 Vac/50 Hz ☑ 120 Vac/60 Hz

EUT Description: Frequency Translator S/N 1390100/1001 ☐ Other:

NOTES: Full Power Maximum Gain Temperature: 22 °C

Air Pressure: 99.8 kPa

Relative Humidity: 51 %

Channel 1 & Channel 2 ON GSM Modulation OFF

TEST LEVEL V	TEST LEVEL %	OUTPUT FREQUENCY	INPUT CURRENT	COMPLIES YES	COMPLIES NO	POWER (WATTS) / POWER FACTOR / Δ Hz REMARKS
97.75	85	1,988799925	1.01	✓		96.5 / 0.996 / +10 Hz
	↓					
132.25	115	1,988799923	0.74	✓		96.5 / 0.990 / +5 Hz
115.0	0	1,988799915	0.90	✓		96.5 / 0.993 / 0 Hz

Tested By: J. ADIE BERNARDIN (Printed) (Signature)

Reviewed by: JIM OWEN (Printed) (Signature)

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Frqstb

7/31/01 & 8/1/01
Freq. Stability
2.1055

"06:53:36"	0	17.027
"06:54:42"	0	16.48
"06:55:49"	0	16.206
"06:56:56"	0	16.397
"06:58:03"	0	16.548
"06:59:10"	0	16.654
"07:00:16"	0	16.734
"07:01:23"	0	16.8
"07:02:30"	0	16.82
"08:02:46"	640	26.459
"08:03:53"	0	26.47
"08:05:00"	0	26.448
"08:06:07"	0	26.498
"08:07:13"	0	26.489
"08:08:20"	0	26.502
"08:09:27"	0	26.509
"08:10:33"	0	26.548
"08:11:40"	0	26.548
"08:12:47"	0	26.59
"09:13:04"	-1408	36.19
"09:14:11"	0	36.17
"09:15:17"	0	36.2
"09:16:24"	0	36.18
"09:17:31"	0	36.2
"09:18:37"	0	36.18
"09:19:44"	0	36.19
"09:20:51"	0	36.19
"09:21:58"	0	36.2
"09:23:04"	0	36.23
"10:23:21"	-384	45.92
"10:24:28"	0	45.91
"10:25:35"	0	45.92
"10:26:41"	0	45.93
"10:27:48"	0	45.92
"10:28:55"	0	45.94
"10:30:02"	0	45.92
"10:31:08"	0	45.94
"10:32:15"	0	45.94
"10:33:22"	0	45.98
"21:11:39"	-640	-30.61
"21:12:46"	0	-30.216
"21:13:53"	0	-30.43
"21:15:00"	0	-30.29
"21:16:06"	0	-30.53
"21:17:13"	0	-30.39
"21:18:20"	0	-30.236
"21:19:27"	0	-30.55
"21:20:34"	0	-30.038
"21:21:40"	0	-30.69

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Frqstb

Freq. Stability
2.1255

"01:00:11"	7.999795E+07	-30.3
"01:01:19"	8E+07	-29.888
"01:02:25"	8E+07	-29.806
"01:03:32"	8E+07	-30.014
"01:04:39"	8E+07	-29.324
"01:05:45"	8E+07	-30.245
"01:06:52"	8E+07	-29.994
"01:07:59"	8E+07	-30.028
"01:09:56"	0	-30.046
"01:11:03"	0	-30.175
"02:11:20"	-768	-21.429
"02:12:26"	0	-21.576
"02:13:33"	0	-21.475
"02:14:40"	0	-21.55
"02:15:46"	0	-21.499
"02:16:53"	0	-21.554
"02:18:00"	0	-21.54
"02:19:07"	0	-21.597
"02:20:13"	0	-21.605
"02:21:20"	0	-21.571
"03:21:37"	768	-11.817
"03:22:44"	0	-12.294
"03:23:51"	0	-11.932
"03:24:57"	0	-12.46
"03:26:04"	0	-11.99
"03:27:11"	0	-12.371
"03:28:17"	0	-12.01
"03:29:24"	0	-12.276
"03:30:31"	0	-12.09
"03:31:38"	0	-12.192
"04:31:54"	256	-3.034
"04:33:01"	0	-3.043
"04:34:08"	0	-3.098
"04:35:15"	0	-2.684
"04:36:21"	0	-2.469
"04:37:28"	0	-2.316
"04:38:35"	0	-2.414
"04:39:41"	0	-2.836
"04:40:48"	0	-2.423
"04:41:55"	0	-2.675
"05:42:12"	1408	6.847
"05:43:18"	0	6.588
"05:44:25"	0	6.914
"05:45:32"	0	7.093
"05:46:38"	0	7.185
"05:47:45"	0	7.293
"05:48:52"	0	7.439
"05:49:59"	0	7.169
"05:51:06"	0	6.967
"05:52:12"	0	7.182
"06:52:29"	896	16.954

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ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

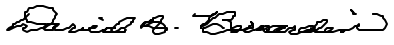
All tests were performed per *FCC Part 2, Paragraphs 2.1046, 2.1049, 2.,1051, 2.1053, 2.1055(d)(1); Part 24, Paragraph 24,238*.

The Equipment Under Test

■ - **Fulfills** the requirements of *FCC Part 2, Paragraphs 2.1046, 2.1049, 2.,1051, 2.1053, 2.1055(d)(1); Part 24, Paragraph 24,238*.

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Dave Bernardin
(EMC Engineer)

TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

INTERMODULATION TESTS PERFORMED BY LITTLEFEET, INC.

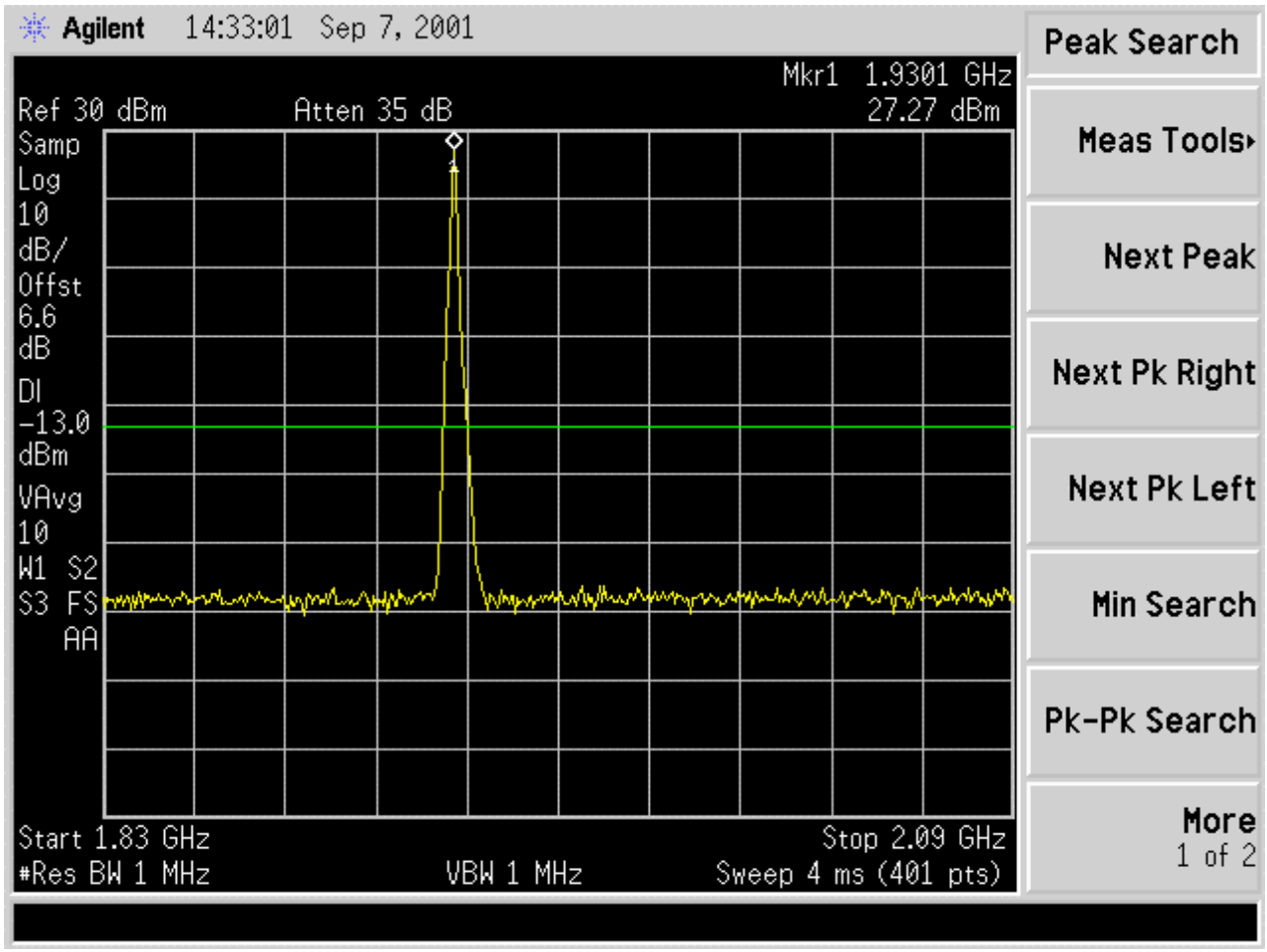
TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 546 3999 FAX 858 546 0364

SC/055-29

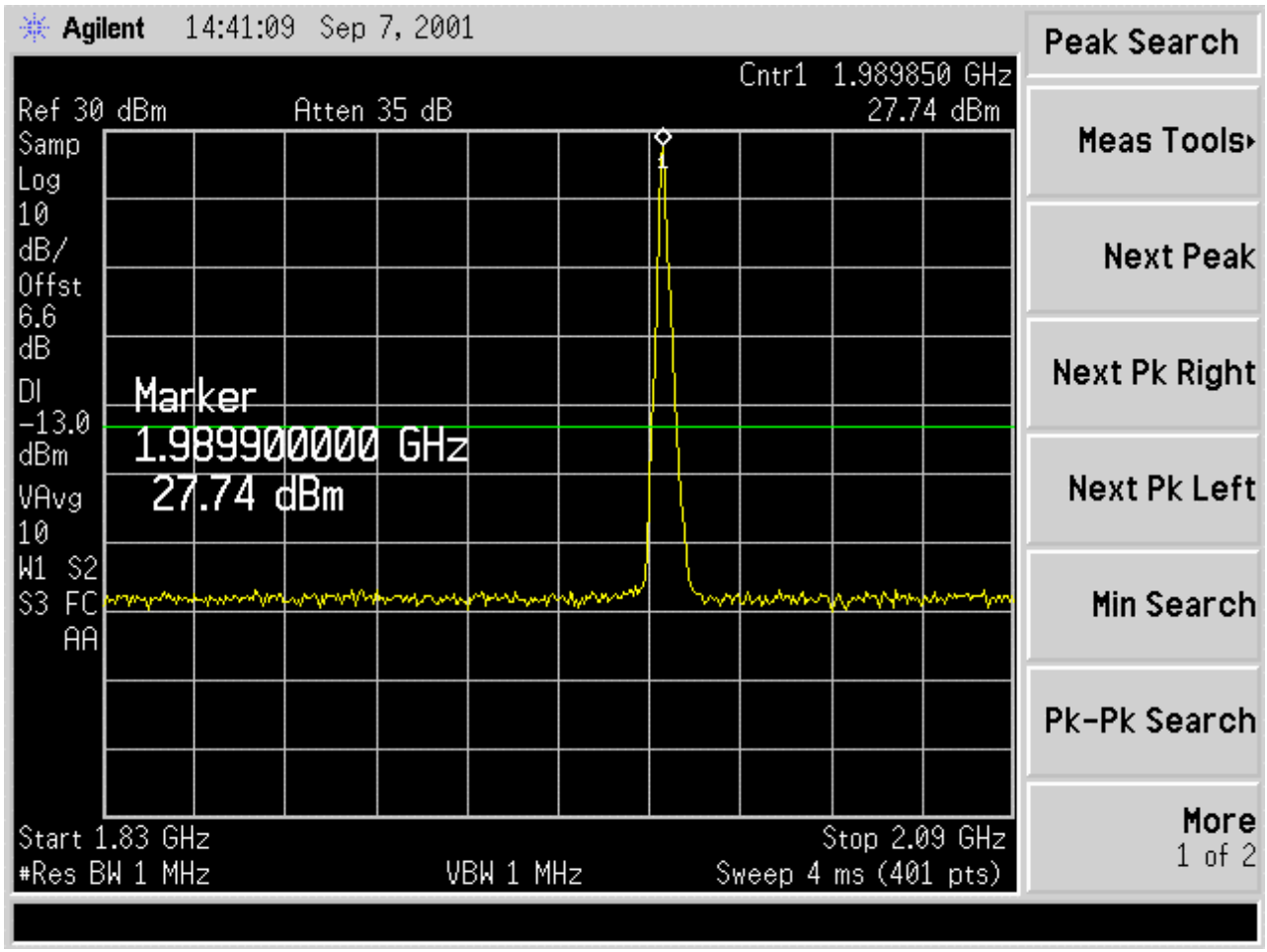
EQUIPMENT LIST
for Intermodulation test
27/07/01

Description	Manufacturer	Model #	S/N	Cal Date d m y
Signal Generator	Agilent	E4437B	US39260520	23/09/00
Signal Generator	Agilent	E4426B	US39260229	16/10/00
Signal Generator	Agilent	E4421B	US39340787	14/12/00
Spectrum Analyzer	H.P.	E4402B	US39440814	02/04/01
VSA				
Frequency Counter				
Combiner				
Thermal Chamber				

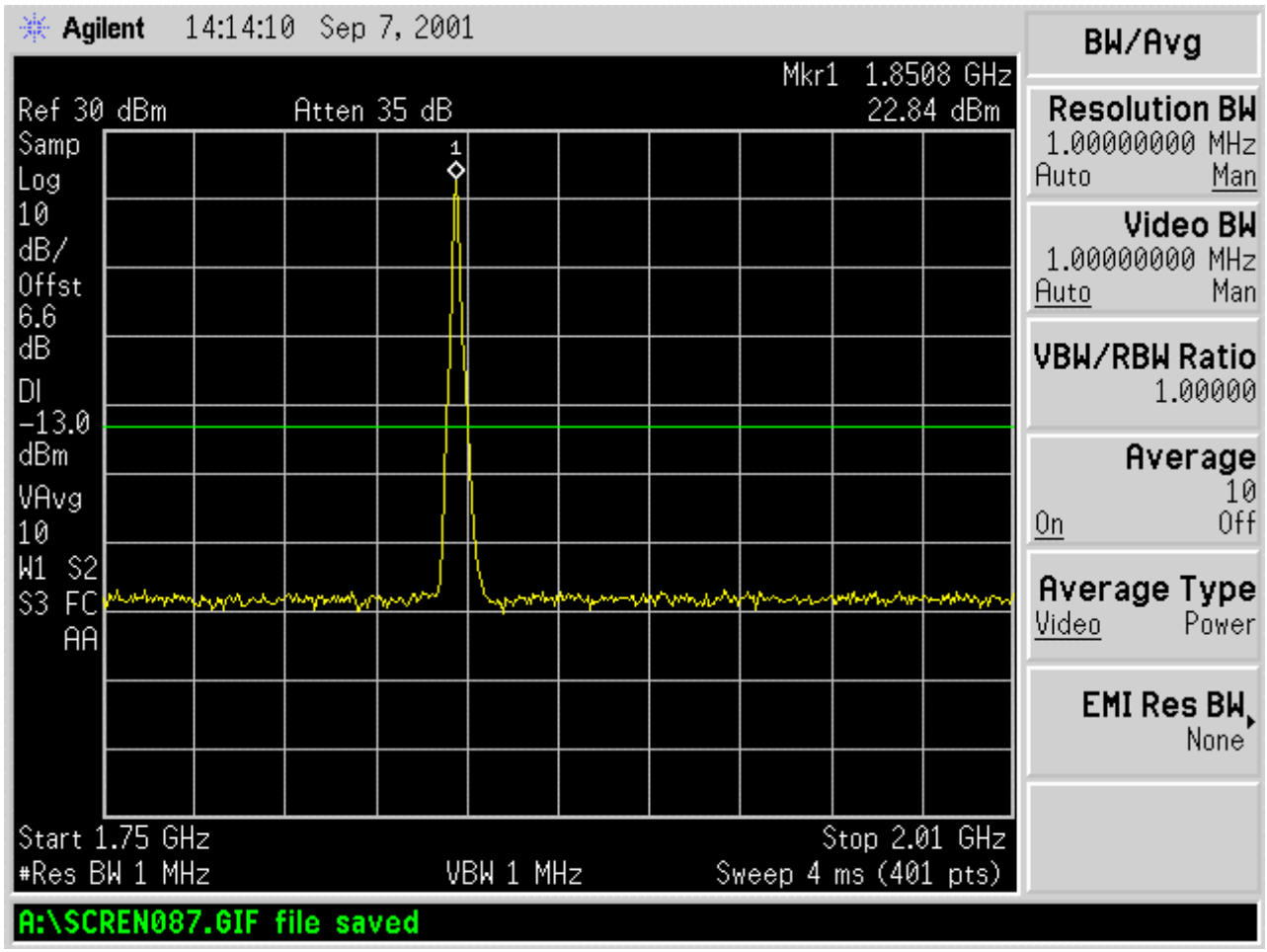
54


Agilent 14:33:01 Sep 7, 2001
Mkr1 1.9301 GHz
27.27 dBm
Ref 30 dBm
Atten 35 dB
Samp
Log
10
dB/
Offst
6.6
dB
Dl
-13.0
dBm
VAvg
10
W1 S2
S3 FS
AA
Start 1.83 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.09 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

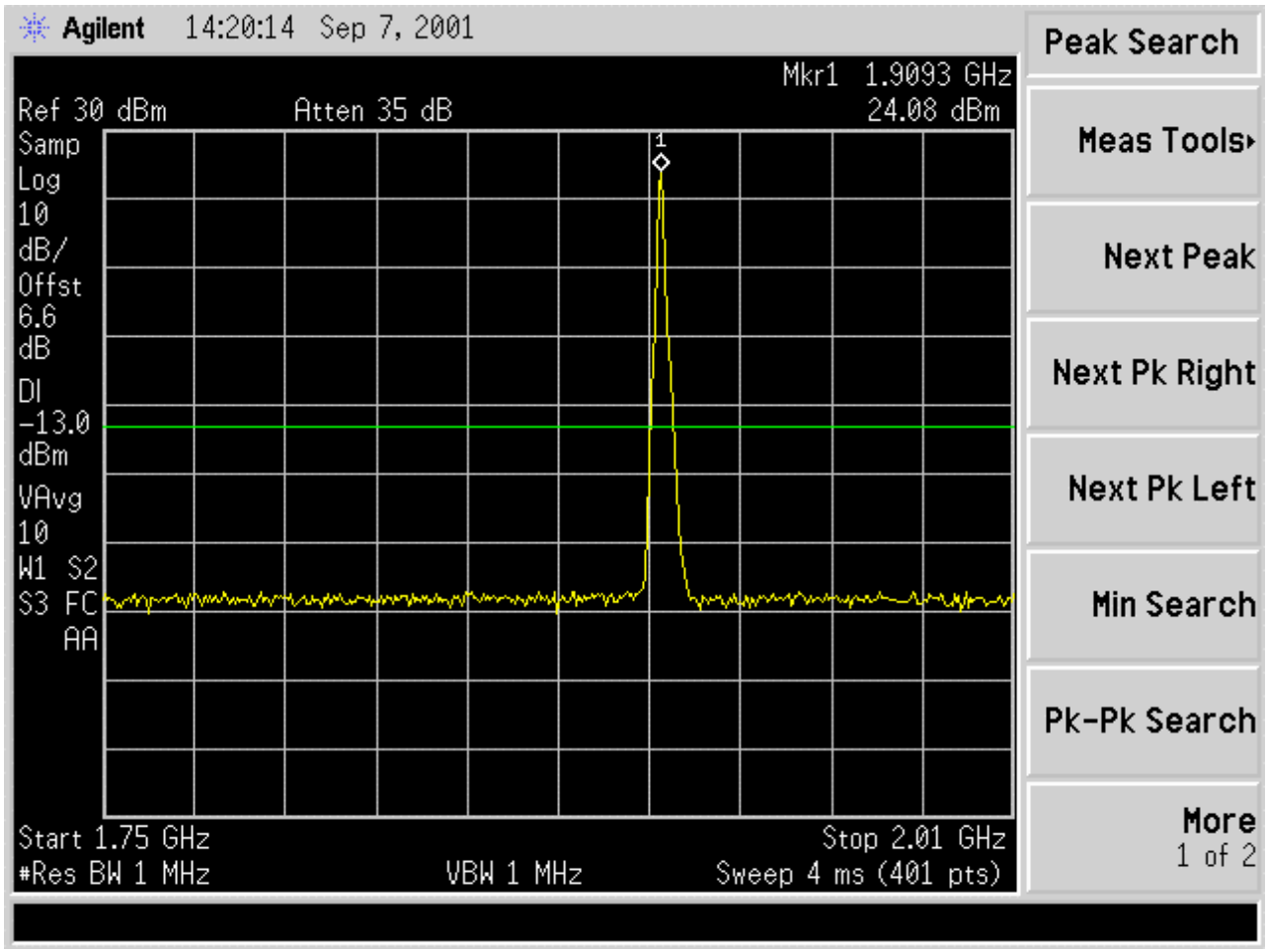
DL bottom


Agilent 14:41:09 Sep 7, 2001
Cntr1 1.989850 GHz
27.74 dBm
Ref 30 dBm
Atten 35 dB
Samp
Log
10
dB/
Offst
6.6
dB
Dl
-13.0
dBm
VAvg
10
W1 S2
S3 FC
AA
Marker
1.989900000 GHz
27.74 dBm
Start 1.83 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.09 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

DL TOP


Agilent 14:14:10 Sep 7, 2001
Mkr1 1.8508 GHz
Ref 30 dBm
Atten 35 dB
22.84 dBm
Samp
Log
10
dB/
Offst
6.6
dB
Dl
-13.0
dBm
VAvg
10
W1 S2
S3 FC
AA
Start 1.75 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.01 GHz
Sweep 4 ms (401 pts)
BW/Avg
Resolution BW
1.00000000 MHz
Auto Man
Video BW
1.00000000 MHz
Auto Man
VBW/RBW Ratio
1.00000
Average
10
On Off
Average Type
Video Power
EMI Res BW
None
A:\SCREN087.GIF file saved

UL BOTTOM


Agilent 14:20:14 Sep 7, 2001
Mkr1 1.9093 GHz
Ref 30 dBm
Atten 35 dB
24.08 dBm
Samp
Log
10
dB/
Offst
6.6
dB
Dl
-13.0
dBm
VAvg
10
W1 S2
S3 FC
AA
Start 1.75 GHz
#Res BW 1 MHz
VBW 1 MHz
Stop 2.01 GHz
Sweep 4 ms (401 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

UL TOP