

MEASUREMENT AND TECHNICAL REPORT

TEXAS INSTRUMENTS, INC.
6550 Chase Oaks Boulevard
Plano, TX 75023

DATE: 19 June 2001

This Report Concerns:	Original Grant: X	Class II Change:
Equipment Type:	Tag-it UHF Reader, Model S7000	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes:	No: X
	Defer until:	
<i>Company Name</i> agrees to notify the Commission by:	N/A	
of the intended date of announcement of the product so that the grant can be issued on that date.		
Transition Rules Request per 15.37?	Yes:	*No:
<i>(*) FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)</i>		
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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1 GENERAL INFORMATION

1.1 Product Description

EUT Description 9 Antenna RF Identification Transceiver
EUT Name Tag-it UHF Reader
Model No.: S7000 Serial No.: 519001
Product Options: _____
Configurations to be tested: 9 Antennas, multiplexing

Power Requirements

Voltage: 120 VAC (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: 1

Current (Amps/phase(max)): 1 Current (Amps/phase(nominal)): 0.2

Other _____

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Industrial

EUT Power Cable

Permanent OR Removable Length (in meters): 2
 Shielded OR Unshielded
 Not Applicable

EUT Interface Ports and Cables

Interface			Shielding		Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent	
Analog	Digital	Qty	Yes	No								
RS-232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>			Metalized 9-pin D-sub	Characteristic Impedance	4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid	coaxial	SMA	50 ohm	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power cord	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>			Universal Power Cord	Characteristic Impedance	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>

EUT Software.

Revision Level: 53_04
 Description: Standard Firmware to control the scanner functions.

EUT Operating Modes to be Tested

1. Normal operation, multiplexing antennas (in previous tests, this has proven to be worst case)

EUT System Components --

Description	Model #	Serial #	FCC ID #
Tag-it UHF Reader	S7000	5190001	A92RU1001A
RF Cables (9)	N/A	N/A	
Seavey Antenna	0015-804	130978-130987	

Support Equipment --			
<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>
Toshiba Laptop Computer	PA1230U VCD	03733928-1	CJ6UK436

Oscillator Frequencies			
<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
20 MHz		Y1/Transmitter section of PCB	Main clock for entire scanner PCB

Power Supply			
<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
Power Components Intl.	DUT-45W-V-9	N/A	<input checked="" type="checkbox"/> Switched-mode: (Frequency) 200 KHz

Power Line Filters		
<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>
None		

Critical EMI Components (Capacitors, ferrites, etc.)				
<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>
25 Pin Filtered Connector	Metuchen	56-524-014-GBL	2	P1 and P2 - Internal Scanner PCB

EMC Critical Detail --

PCB Housing acts as EMI enclosure

1 GENERAL INFORMATION (continued)

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 15, Paragraphs 15.247((a)(i); (a)(1); (b)(2)
2. Radiated Emissions EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters
X 3. Radiated Emission per FCC Part 15, Paragraphs 15.247(a); (c); (d)
4. Engineering evaluations
5. Frequency Stability, Part 2, Paragraph 2.995, and Part 87, Paragraph 87.133
RF Output Power, Part 2, Paragraph 2.985, Part 22, Paragraph 22.917

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 - 10 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: 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.

1.6 System Information

	Equipment Specifications	Frequency Range: 903-927.5 MHz Rated RF Output Power: 0.70 Watts Frequency Tolerance: +/-100 ppm Emissions Designator: 314KK1D Micro. Model No.: 80C52
	Direct Sequence Gain	N/A
	Description of Receiver Compliance for 15.247(a)(1)	The receiver employs a homodyne architecture. The LO signal in the receiver is split from the transmitted RF early in the transmitter chain, and is therefore, at the same frequency. The received signal is mixed with the LO signal to create a baseband IF. The IF signal is filtered to 1 MHz, which matches the hopping channel bandwidth.
	Scanning Receiver Information	N/A
	Cert. for 60 GHz Transmitters	N/A
	Tune-up Procedure	During finally assembly, the output power is adjusted such that the EIRP will not exceed 36 dBm over specified operating conditions. The adjustment is made by setting a digital potentiometer, within the unit, while monitoring the output power. The final potentiometer value is fixed in non-volatile memory.

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.

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.

Radiated Electromagnetic Emissions



Test Report #: **S0414 Run 1**
 Test Method: **FCC Part 15, 15.209(a)**
 EUT Model #: **S7000, 15.205(d), 15.247(G)**
 EUT Serial #: **U5190013**
 Manufacturer: **TI**

Test Area: **Site 3 Roof**
 Test Date: **16-Oct-2088**
 EUT Power: **115 Vac to 9 VDC Power Converter**

Temperature: **25 °C**
 Relative Humidity: **45 %**
 Air Pressure: **100.1 kPa**

Page: 2 of 2

EUT Description: **9 Antenna RF Identification Transceiver**

Notes:

Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av - Average	

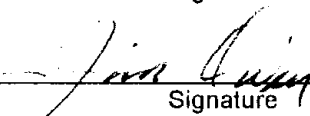
FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) FCC A (> 1GHz)	DELTA2 (dB) N/A
9275.00	42.3 Pk	10.3 / 39.3 / 37.3	54.5	H / 1.0 / 0.0	-52.6	N/A
Mid Channel Harmonics Measurements Below						
1830.00	69.5 Pk	4.1 / 28.1 / 39.9	61.8	H / 1.0 / 0.0	-44.0	N/A
Change Polarity						
1830.00	72.2 Pk	4.1 / 28.1 / 39.9	64.5	V / 1.0 / 0.0	-39.8	N/A
Low Channel Harmonic Measurements Below						
1806.00	58.6 Pk	4.1 / 28.0 / 39.9	50.8	V / 1.0 / 0.0	-55.3	N/A
2709.00	47.6 Pk	5.3 / 31.1 / 39.5	44.5	V / 1.0 / 0.0	-15.5	N/A
3612.00	40.4 Pk	6.7 / 33.2 / 39.7	40.6	V / 1.0 / 0.0	-19.4	N/A
4515.00	41.5 Pk	7.3 / 33.5 / 40.6	41.7	V / 1.0 / 0.0	-18.3	N/A
5418.00	40.4 Pk	7.5 / 36.0 / 38.6	45.3	V / 1.0 / 0.0	-14.7	N/A
Polarity Change						
1806.00	60.5 Pk	4.1 / 28.0 / 39.9	52.7	H / 1.0 / 0.0	-51.7	N/A
2709.00	48.8 Pk	5.3 / 31.1 / 39.5	45.7	H / 1.0 / 0.0	-14.3	N/A
3612.00	40.6 Pk	6.7 / 33.2 / 39.7	40.8	H / 1.0 / 0.0	-19.2	N/A
4515.00	41.6 Pk	7.3 / 33.5 / 40.6	41.8	H / 1.0 / 0.0	-18.2	N/A
5418.00	39.9 Pk	7.5 / 36.0 / 38.6	44.8	H / 1.0 / 0.0	-15.2	N/A
Mid Channel Harmonics – remeasured below						
2745.00	42.0 Pk	5.4 / 31.1 / 39.5	39.0	H / 1.0 / 0.0	-21.0	N/A
2745.00	46.5 Pk	5.4 / 31.1 / 39.5	43.5	V / 1.0 / 0.0	-16.5	N/A

Tested by: R Rodel
 Printed


 Signature

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Reviewed by: Jim Owen
 Printed


 Signature

Radiated Electromagnetic Emissions



Test Report #: S0414 Run 1 Test Area: Site 3 Roof
 Test Method: FCC Part 15 15.209(a) Test Date: 16-Oct-2088
 EUT Model #: 57000 15.205(d) 15.247(e) EUT Power: 115 Vac to 9 VDC Power Converter
 EUT Serial #: U5190013
 Manufacturer: TI
 EUT Description: 9 Antenna RF Identification Transceiver

Temperature: 25 °C
 Relative Humidity: 45 %
 Air Pressure: 100.1 kPa

Page: 1 of 2

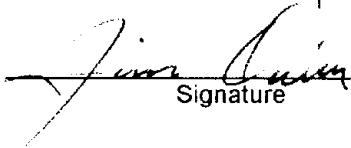
Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av – Average	

FREQ (MHz)	LEVEL (dBuV)	CABLE / ANT / PREAMP (dB) (dB/m) (dB)	F _{INAL} (dBuV/m)	POL / HGT / AZ (m) (DEG)	DELTA1 (dB) FCC A (> 1GHz)	DELTA2 (dB)
903.00	98.6 Pk	2.4 / 23.3 / 0.0	124.4	H / 1.0 / 0.0	N/A	N/A
903.00	100.3 Pk	2.4 / 23.3 / 0.0	126.1	V / 1.0 / 0.0	N/A	N/A
Low Channel Fundamental Measurements Above						
915.00	98.4 Pk	2.4 / 23.5 / 0.0	124.3	V / 1.0 / 0.0	N/A	N/A
915.00	99.9 Pk	2.4 / 23.5 / 0.0	125.8	H / 1.0 / 0.0	N/A	N/A
Mid Channel Fundamental Measurements Above						
927.50	101.1 Pk	2.4 / 23.6 / 0.0	127.1	H / 1.0 / 0.0	N/A	N/A
927.50	97.3 Pk	2.4 / 23.6 / 0.0	123.3	V / 1.0 / 0.0	N/A	N/A
High Channel Fundamental Measurements Above						
High Channel Harmonics Below						
1855.00	75.5 Pk	4.1 / 28.2 / 39.8	68.0	V / 1.0 / 0.0	-35.3	N/A
Below readings are ambient						
2782.50	35.0 Pk	5.5 / 31.2 / 39.5	32.2	V / 1.0 / 0.0	-27.8	N/A
3710.00	35.0 Pk	6.9 / 33.5 / 39.9	35.5	V / 1.0 / 0.0	-24.5	N/A
4637.50	35.0 Pk	7.3 / 33.9 / 40.6	35.6	V / 1.0 / 0.0	-24.4	N/A
5565.00	38.9 Pk	7.5 / 36.3 / 38.1	44.6	V / 1.0 / 0.0	-58.7	N/A
6492.50	43.2 Pk	8.0 / 36.3 / 37.1	50.4	V / 1.0 / 0.0	-52.9	N/A
7420.00	42.3 Pk	8.7 / 38.5 / 36.5	52.9	V / 1.0 / 0.0	-7.1	N/A
8347.50	41.2 Pk	9.7 / 37.6 / 37.0	51.5	V / 1.0 / 0.0	-8.5	N/A
9275.00	42.3 Pk	10.3 / 39.3 / 37.3	54.5	V / 1.0 / 0.0	-48.8	N/A
Polarity Change						
1855.00	73.5 Pk	4.1 / 28.2 / 39.8	66.0	H / 1.0 / 0.0	-41.1	N/A
2782.50	42.3 Pk	5.5 / 31.2 / 39.5	39.5	H / 1.0 / 0.0	-20.5	N/A
3710.00	41.8 Pk	6.9 / 33.5 / 39.9	42.3	H / 1.0 / 0.0	-17.7	N/A
4637.50	41.1 Pk	7.3 / 33.9 / 40.6	41.7	H / 1.0 / 0.0	-18.3	N/A
5565.00	39.2 Pk	7.5 / 36.3 / 38.1	44.9	H / 1.0 / 0.0	-62.2	N/A
6492.50	43.9 Pk	8.0 / 36.3 / 37.1	51.1	H / 1.0 / 0.0	-56.0	N/A
7420.00	42.8 Pk	8.7 / 38.5 / 36.5	53.4	H / 1.0 / 0.0	-6.6	N/A
8347.50	43.6 Pk	9.7 / 37.6 / 37.0	53.9	H / 1.0 / 0.0	-6.1	N/A

Tested by: R Rodel
Printed


Signature

Reviewed by: Jim Owen
Printed


Signature

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Emissions Test Conditions: RADIATED EMISSIONS, FCC Part 15, Paragraphs 15.247(c); (d); (a)

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

- Test not applicable

■ - Room (Small Open Area Test Site) San Diego

Testing was performed at a test distance of:

■ - 3 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3115	453	Antenna, Double Ridge Guide	EMCO	9412-4363	09/01
3146	244	Antenna, Log Periodic Dipole	EMCO	1063	12/00
8566B	744	Spectrum Analyzer	Hewlett Packard	211500842	10/01
85662B	741	Spectrum Analyzer Display	Hewlett Packard	2112A02185	10/01
AMF-SD-010180-35-10P	719	Pre-Amplifier	Miteq	549460	*
HP 8445B	--	RF Pre-Selector	Hewlett Packard	--	--
AA-190-06.00.0	728	Frequency Cables	United Microwave Pro	--	*
AA-190-06.00.0	729	Frequency Cables	United Microwave Pro	--	*
AA-190-30.00.0	732	Frequency Cables	United Microwave Pro	--	*

Remarks: (*) Verified

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:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

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:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} - 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

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.

4 CONDUCTED EMISSION EQUIPMENT/DATA

See following page(s).

Emissions Test Conditions: CONDUCTED EMISSIONS, FCC Part 15, Paragraph 15.247(a)(i); (a)(1); (b)(2) (20 dB Bandwidth, Power Output, and Conducted Spurious

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

- Test not applicable

■ - SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber

Test Equipment Used :

Spectrum Analyzer, Hewlett Packard, Model HP8566B, P/N 744, Cal Date 09/01
Spectrum Analyzer, Hewlett Packard, Model HP8594E, P/N 430, Cal Date 05/01
Attenuator, 10 dB, Hewlett Packard, Model HP8491B, Cal: verified
Attenuator, Variable, Hewlett Packard, Model HP8494B, Cal: verified
Cable, Micropore, Model AA-190, P/N 729, Cal: verified

Remarks: _____

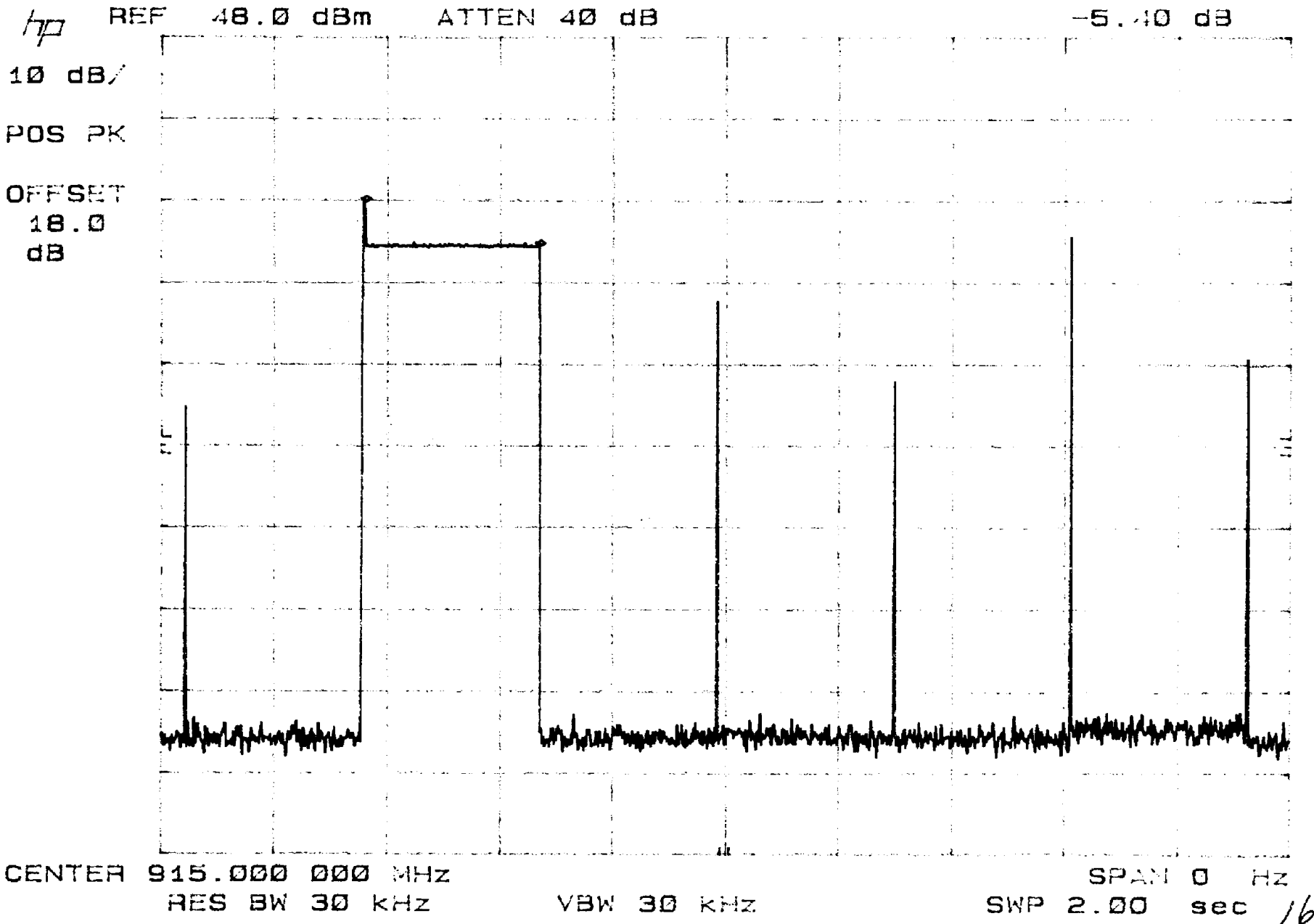
CLIENT: TI
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1)(i)

1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.
2. Hop spacing
3. Hopping frequencies

MKR Δ 310.0 msec
-5.40 dB



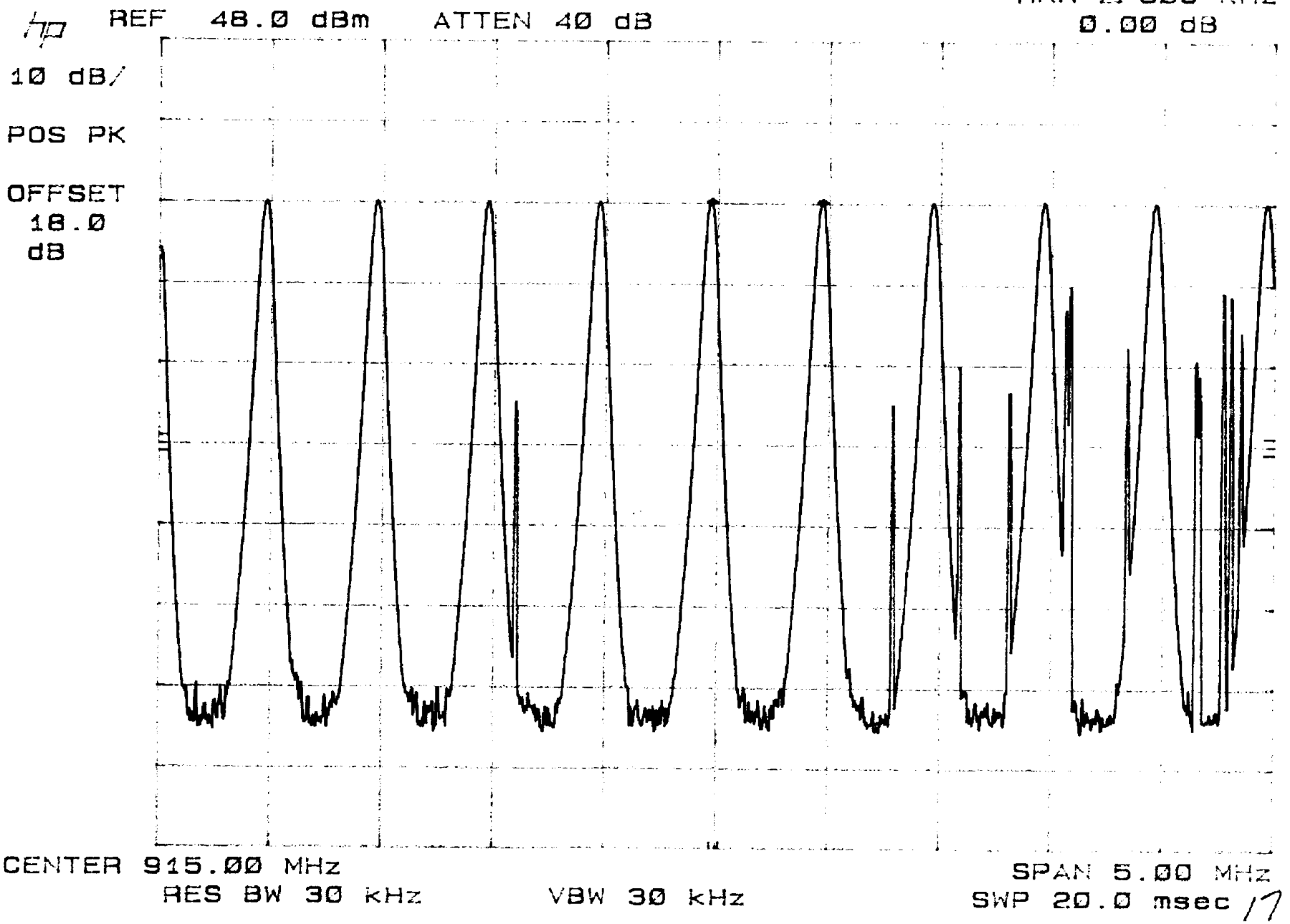
CLIENT: TI
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(i)

- 1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.
- 2. Hopping channel spacing 500 kHz.
- 3. Hopping frequencies

MKR Δ 500 kHz
0.00 dB



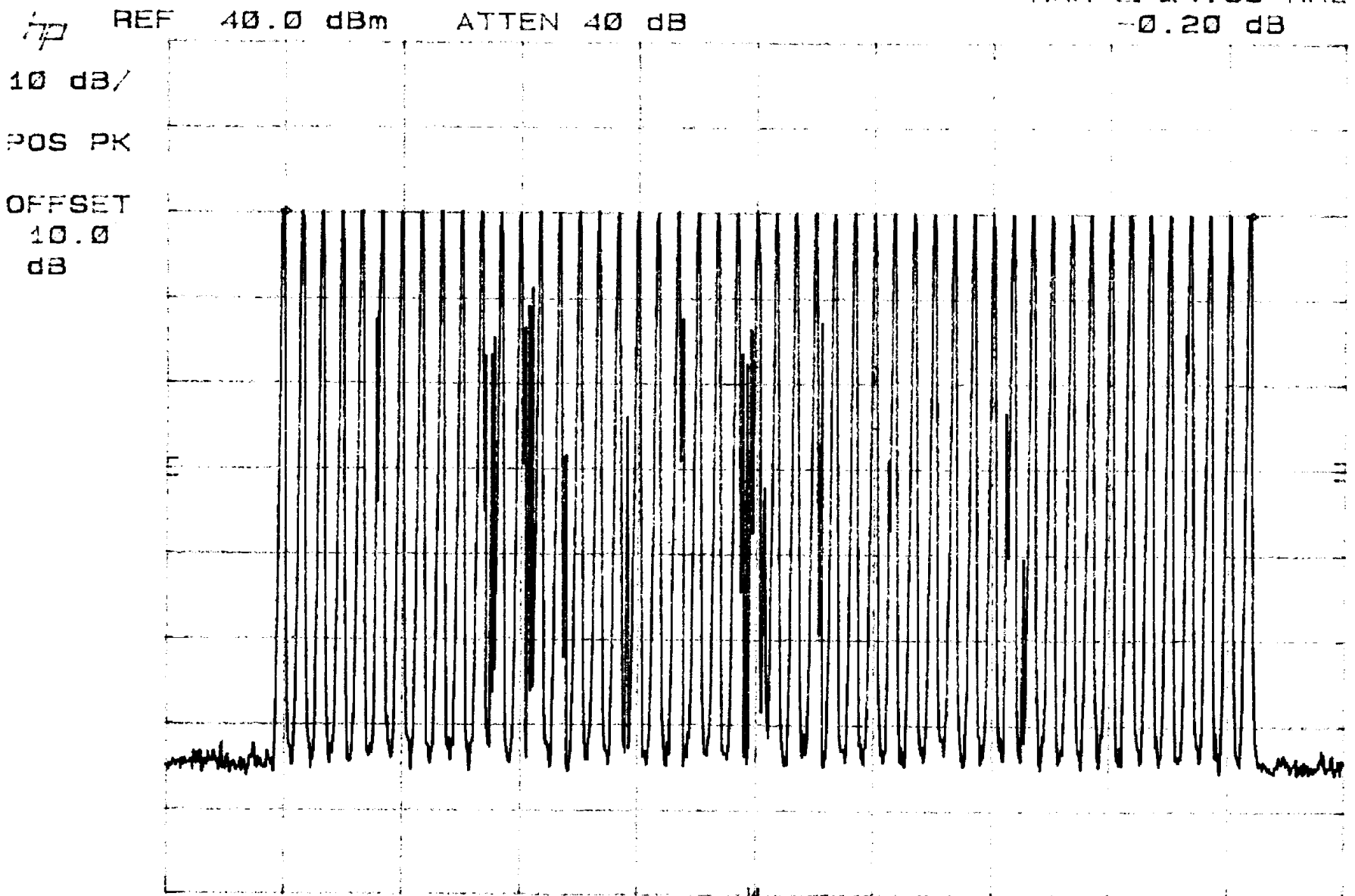
CLIENT: *TI*
NOTE(S):

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(a)(i)

- 1. Average time of occupancy (Verified not on greater than 0.4 sec. In any 10 second time period.
- 2. Hop spacing
- 3. 50 hopping frequencies

MKR Δ 24.60 MHz
-0.20 dB



START 900.0 MHz
RES BW 30 kHz
VSW 30 kHz
STOP 930.0 MHz
SWP 90.0 msec *18*

CLIENT: *TI* DATE: 10/16/00
NOTE(S): 1. 20 dB bandwidth
2. Power output

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

11:09:55 OCT 16, 2000

REF 38.0 dBm AT 30 dB

SMPL OCCUPIED BW (99.50%)

LOG OBW: 37.00 KHz

10 ΔFc: -0.5 KHz

dB Pwr: 28.5 dBm

OFFST

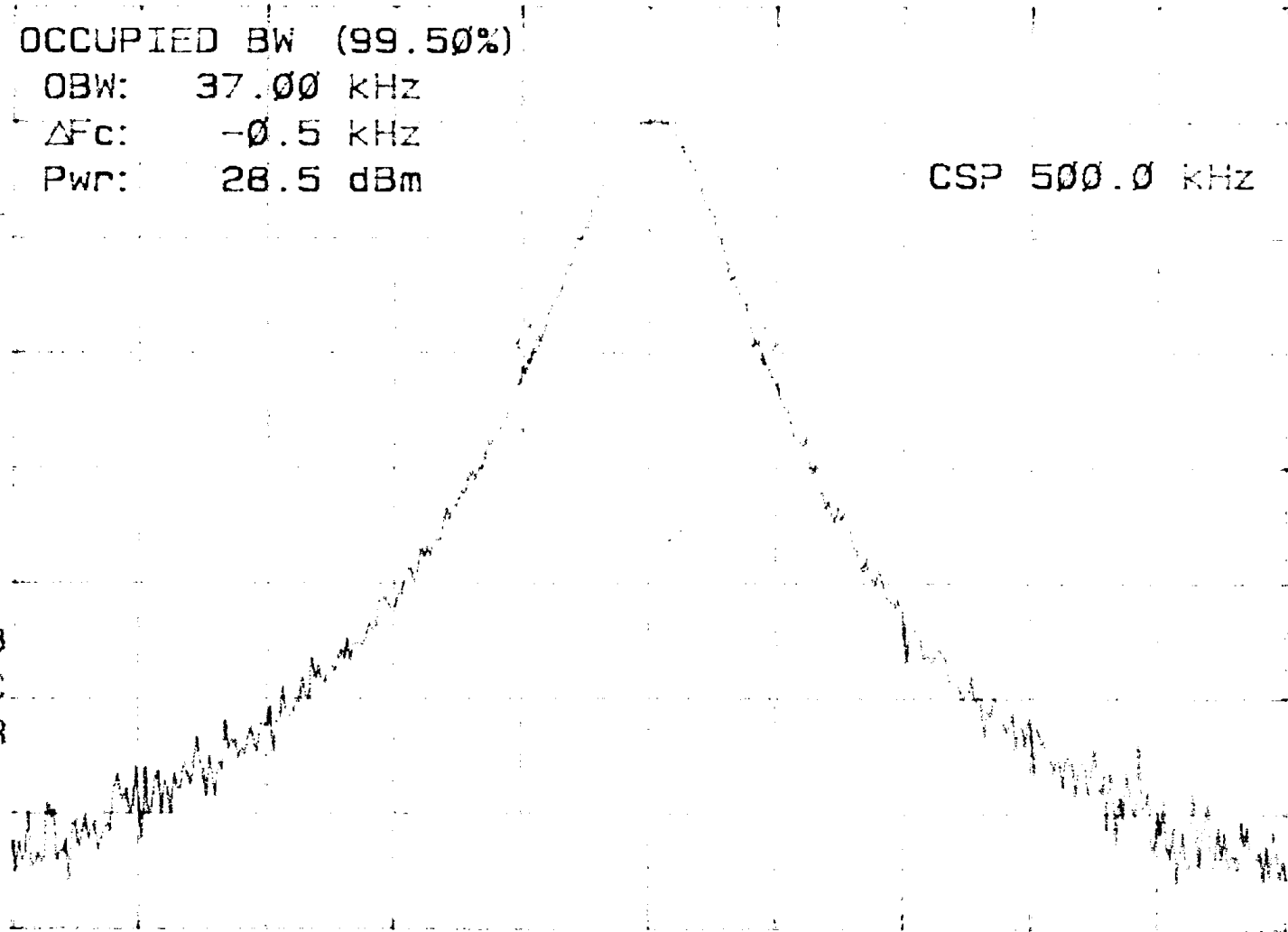
18.0

dB

VA SB

SC FC

CORR



CENTER 902.9740 MHz

#RES BW 10 KHz

#VBW 100 KHz

SPAN 200.0 KHz

SNR 30.0 msec

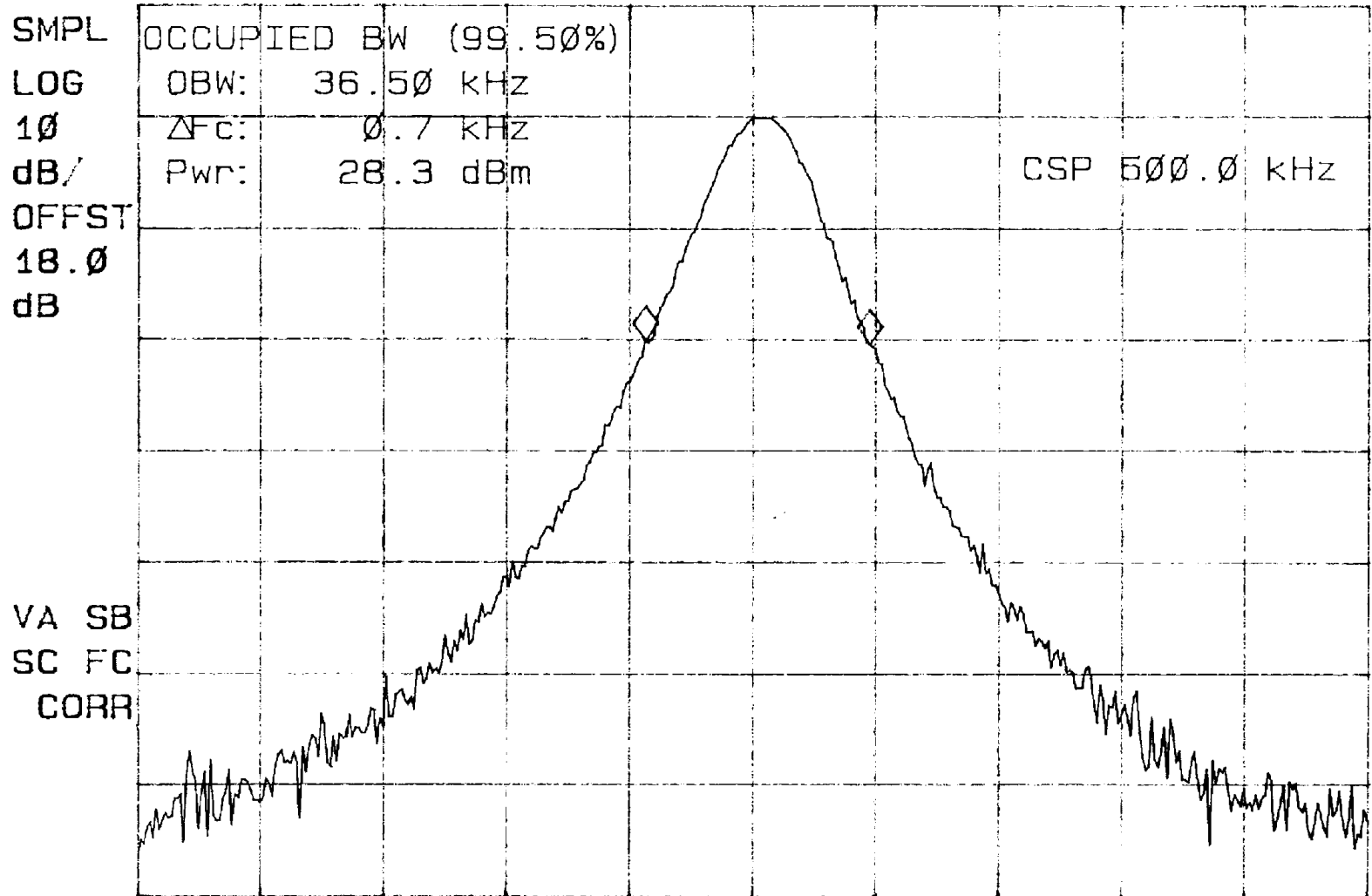
19

CLIENT: *TI* DATE: 10/16/00
NOTE(S): 1. 20 dB bandwidth
2. Power output

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

11: 16: 44 OCT 16, 2000
hp

REF 38.0 dBm AT 30 dB



CENTER 914.9725 MHz

#RES BW 10 KHz

#VBW 100 KHz

SPAN 200.0 KHz *20*

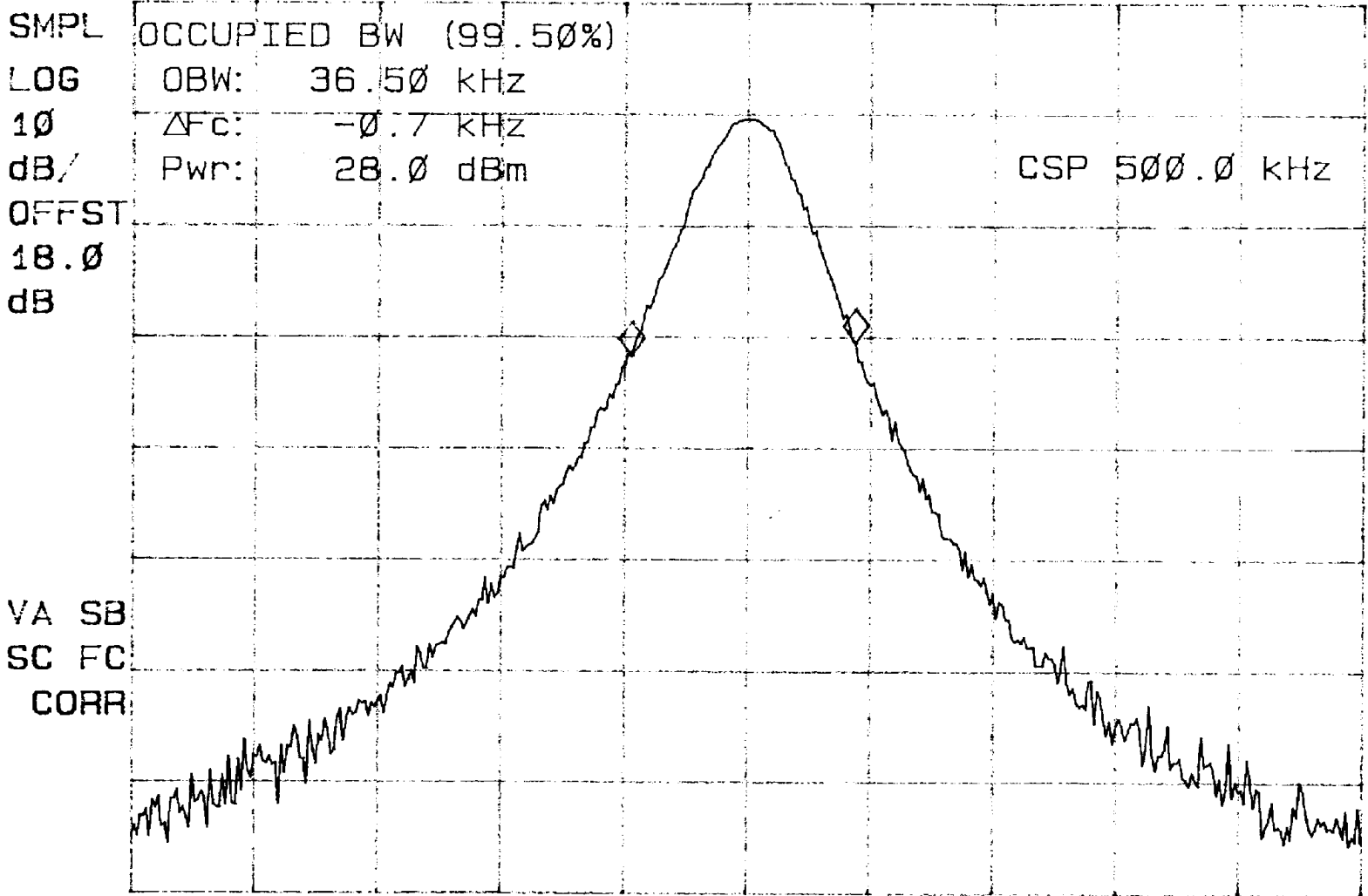
SWP 30.0 msec

CLIENT: *TI* DATE: 10/16/00
NOTE(S): 1. 20 dB bandwidth
2. Power output

SPECIFICATION: FCC Part 15, Para. 15.247(a)(1); (b)(2)

11:20:12 OCT 16, 2000

REF 38.0 dBm AT 30 dB



CENTER 927.4735 MHz

#RES BW 10 KHZ

#VBW 100 KHZ

SPAN 200.0 KHZ *21*

SWP 30.0 msec

CLIENT: *TI* DATE: 10/16/00
NOTE(S): High, 927.5 MHz

SPECIFICATION: FCC Part 15. Para. 15.247(c)(1)

MKR 190.7 MHz
-11.10 dBm

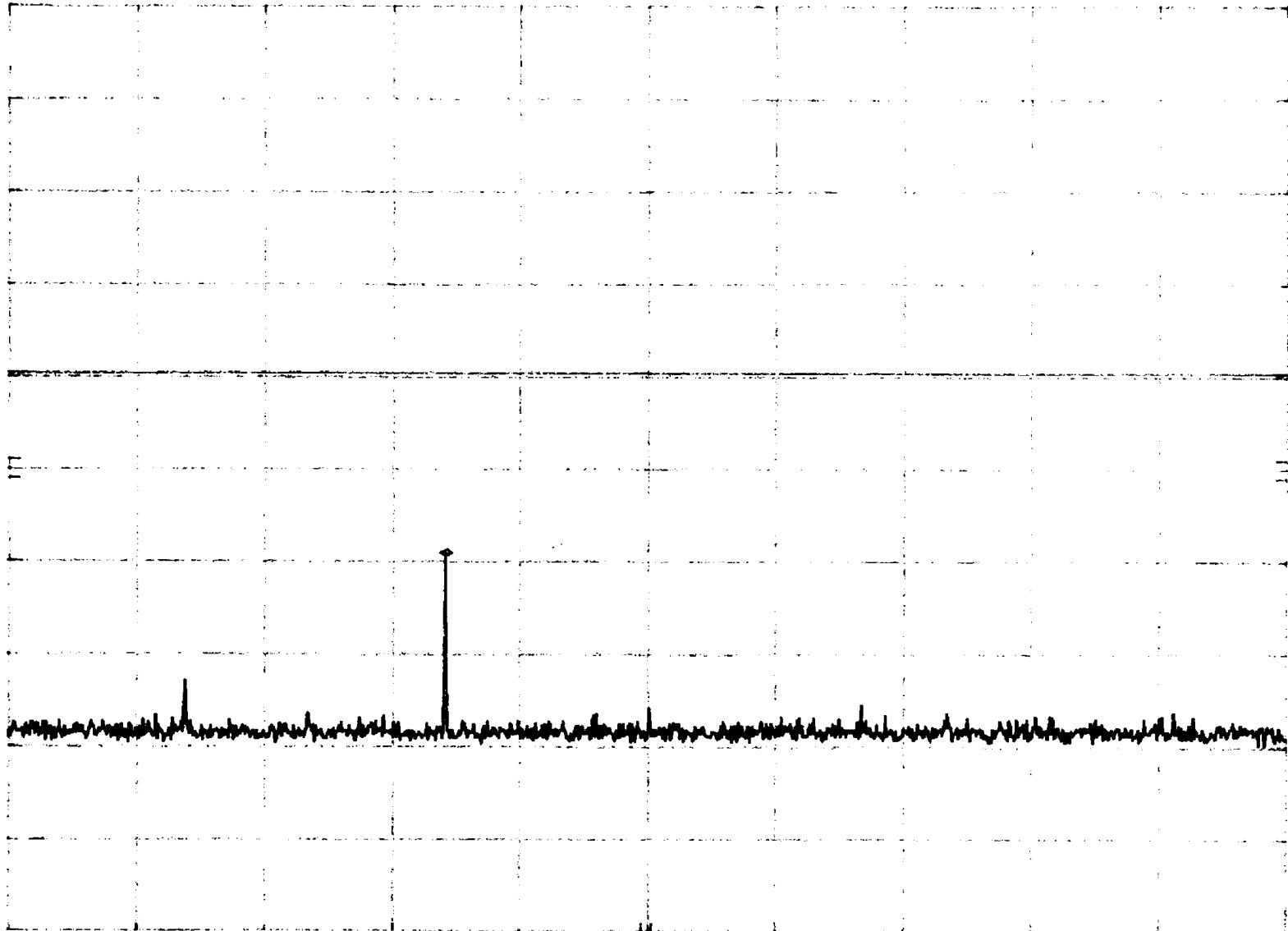
hp REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 30 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 500 MHz

SWP 141 msec 22

CLIENT: *TI*
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 736.5 MHz
-4.60 dBm

hp REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

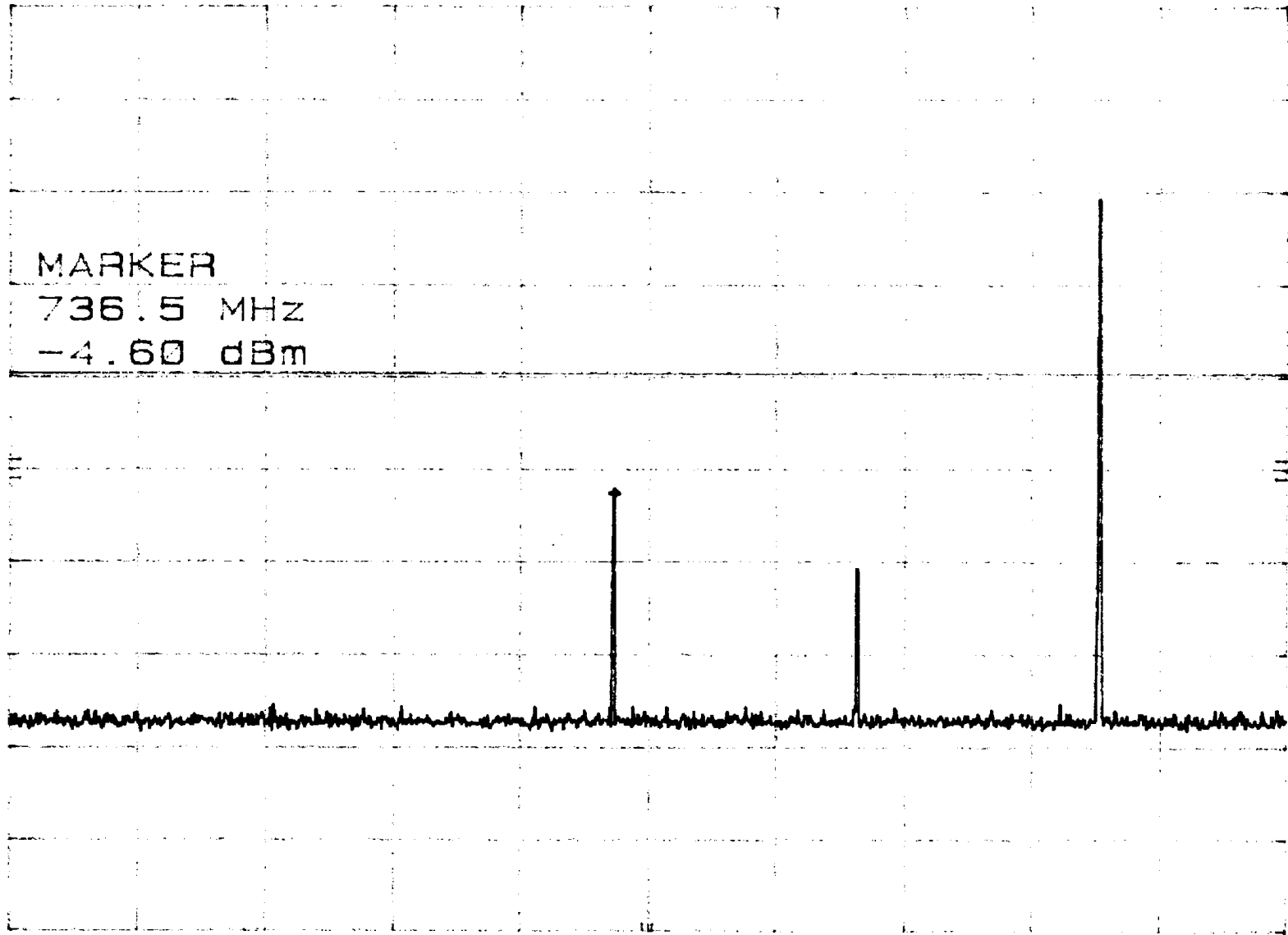
OFFSET

18.0
dB

MARKER

736.5 MHz
-4.60 dBm

DL
8.4
dBm



START 500 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 1.000 GHz

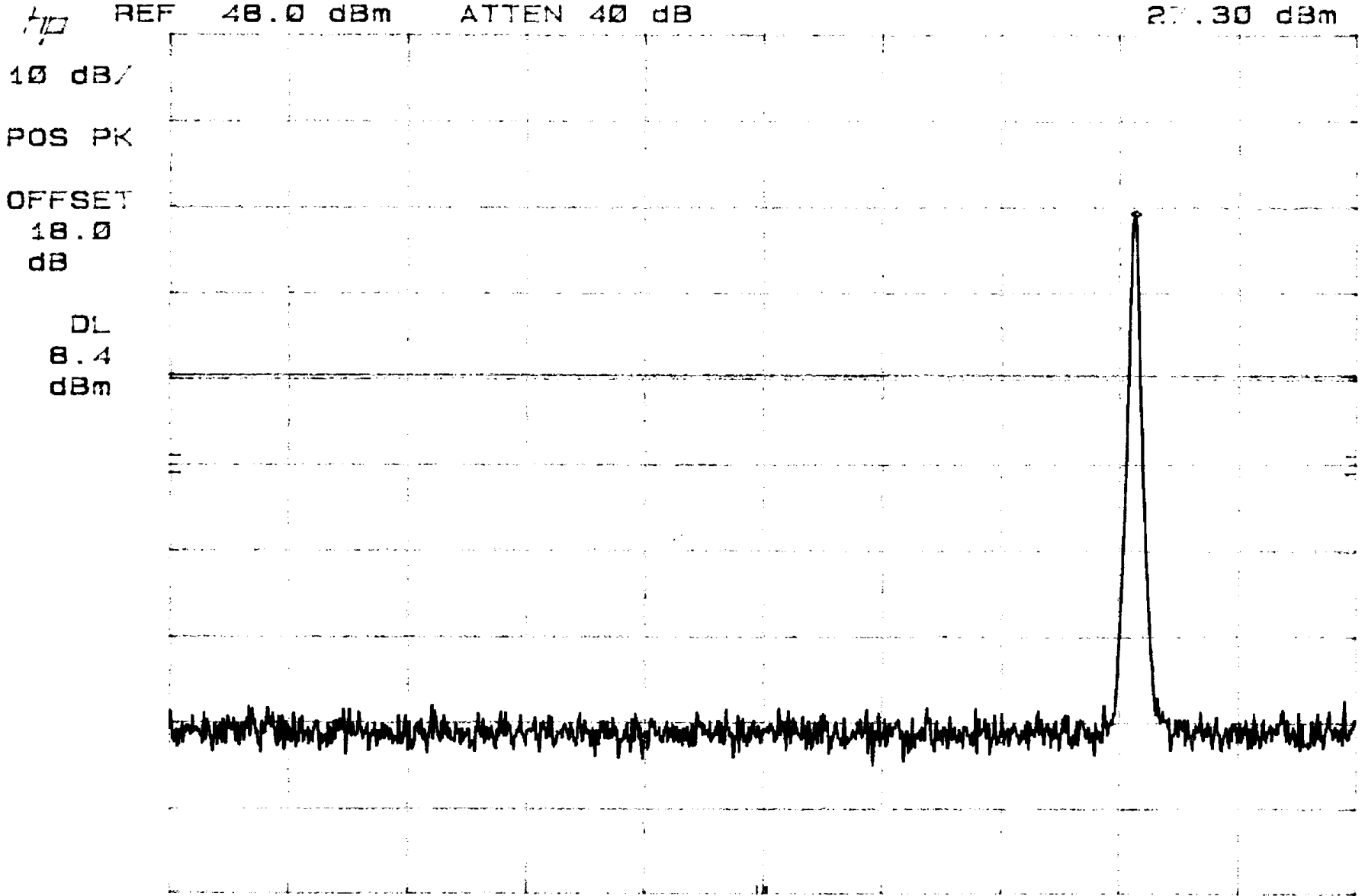
SWP 150 msec 23

CLIENT: *TI*
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 927.56 MHz
27.30 dBm



START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz

SWP 20.0 msec 24

CLIENT: TI
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 1.022 GHz
-25.80 dBm

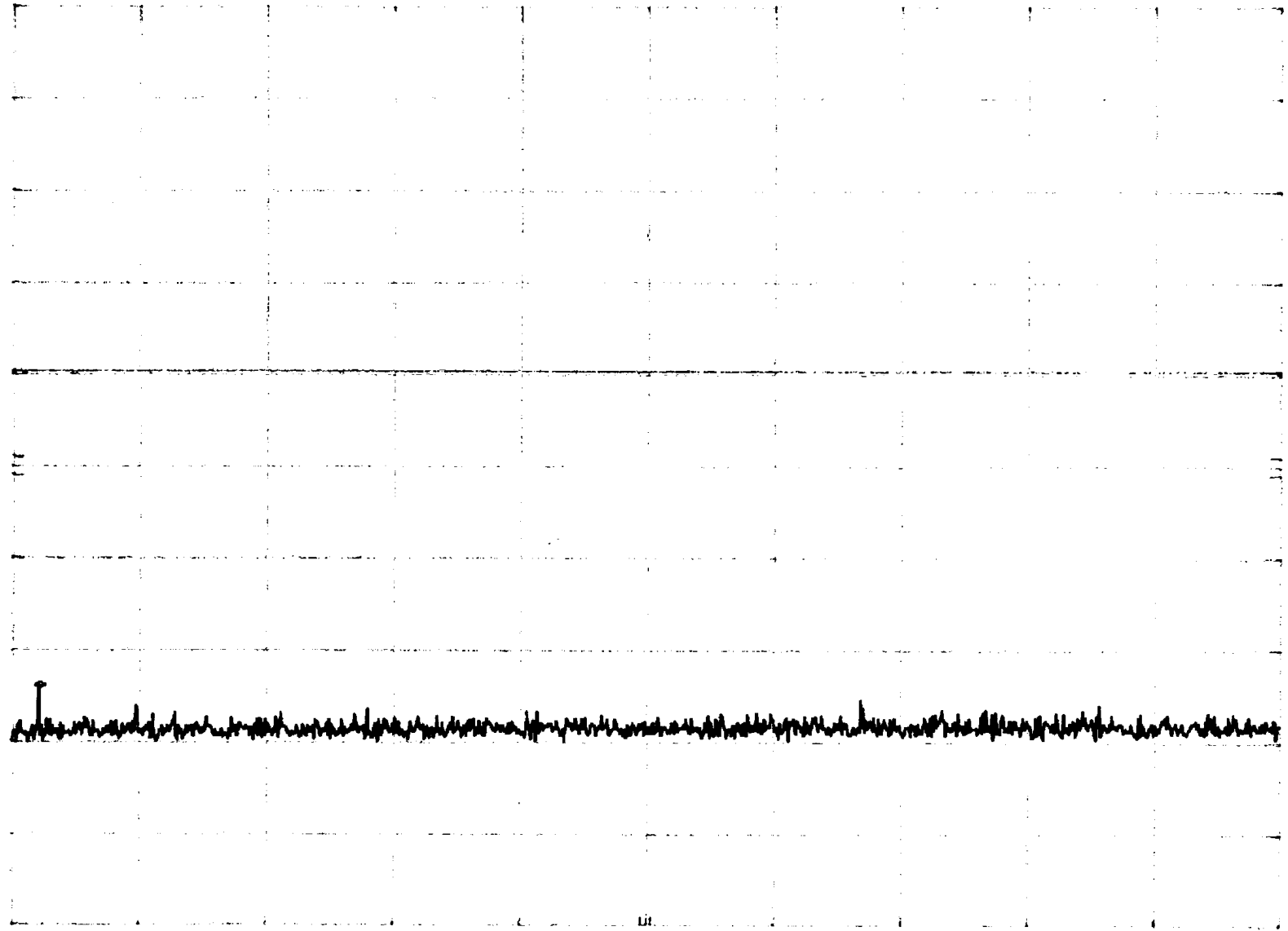
hp REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 1.00 GHz

RES BW 100 KHZ

VBW 100 KHZ

STOP 2.00 GHz

SWP 300 msec 25

CLIENT: *TI*
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 2.480 GHz
-28.10 dBm

hp REF 48.0 dBm ATTN 40 dB

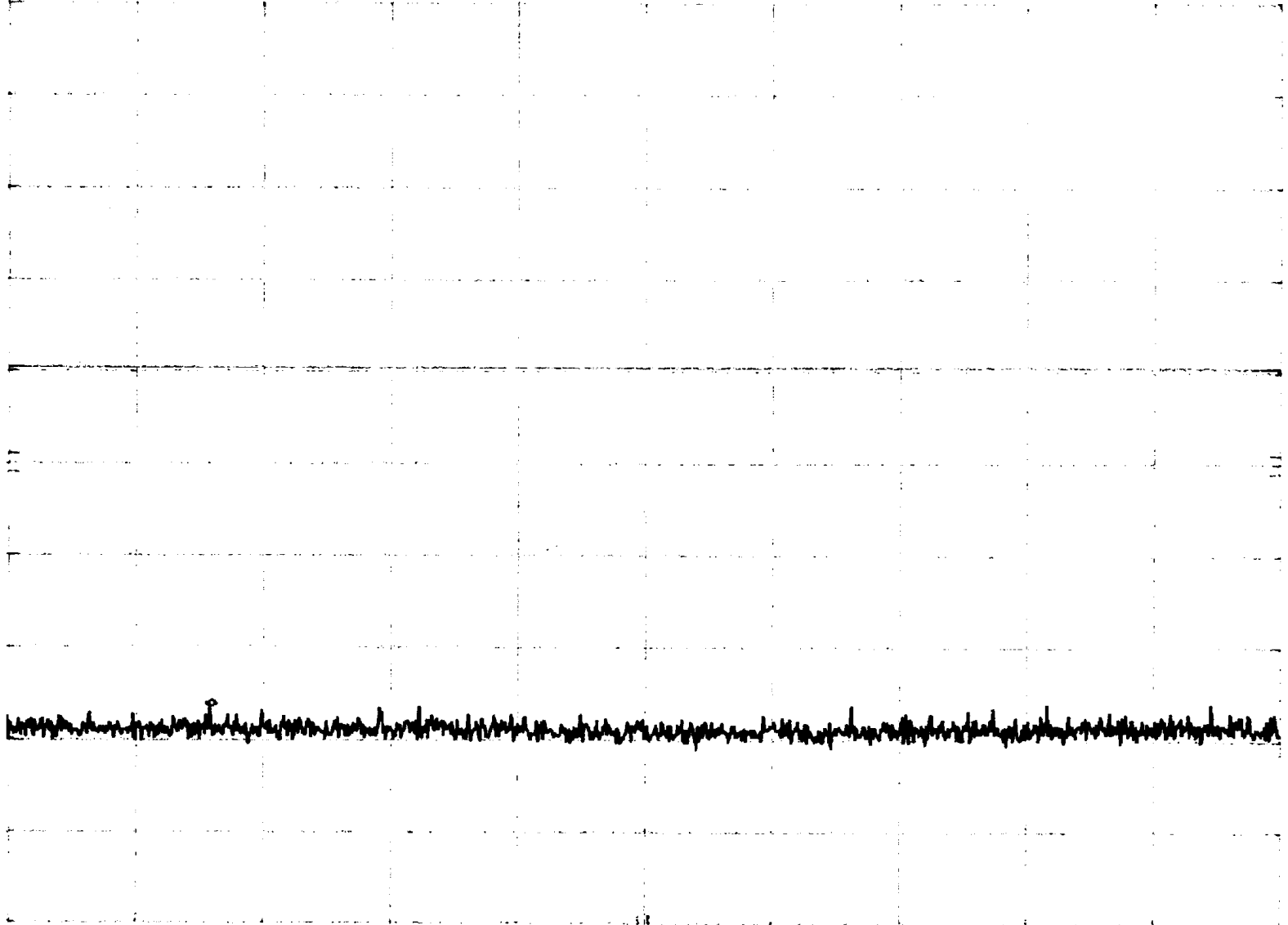
10 dB/

POS PK

OFFSET

18.0
dB

DL
8.4
dBm



START 2.00 GHz

RES BW 100 KHZ

VBW 100 KHZ

STOP 5.00 GHz
SWP 900 msec 26

CLIENT: *TI*
NOTE(S): High

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 5.925 GHz
-21.90 dBm

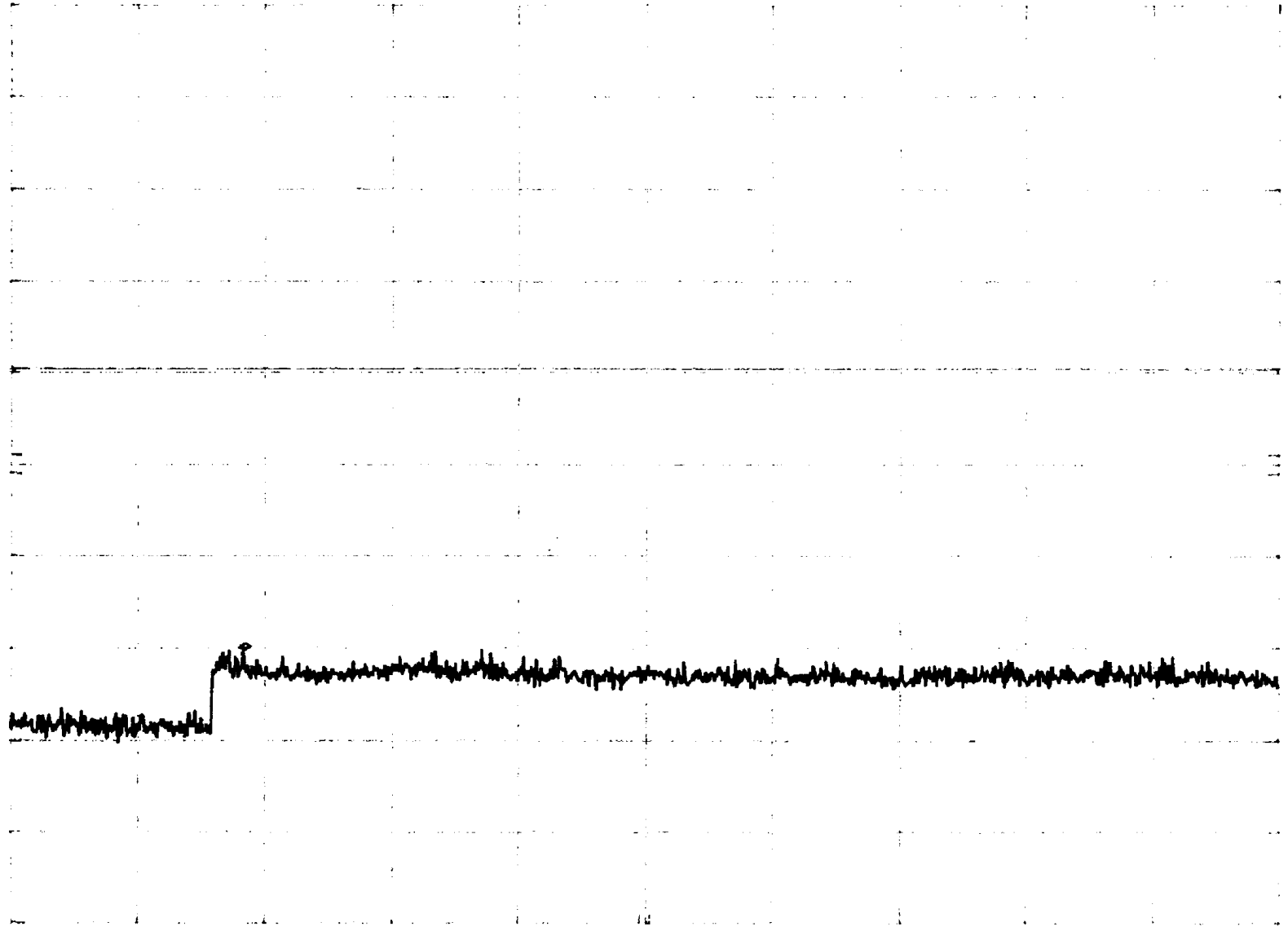
hp REF 48.0 dBm ATTN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz

SWP 1.50 sec *27*

CLIENT: *TI*
NOTE(S):

DATE: 10/16/00
Medium, 915 MHz

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 221.8 MHz
-27.80 dBm

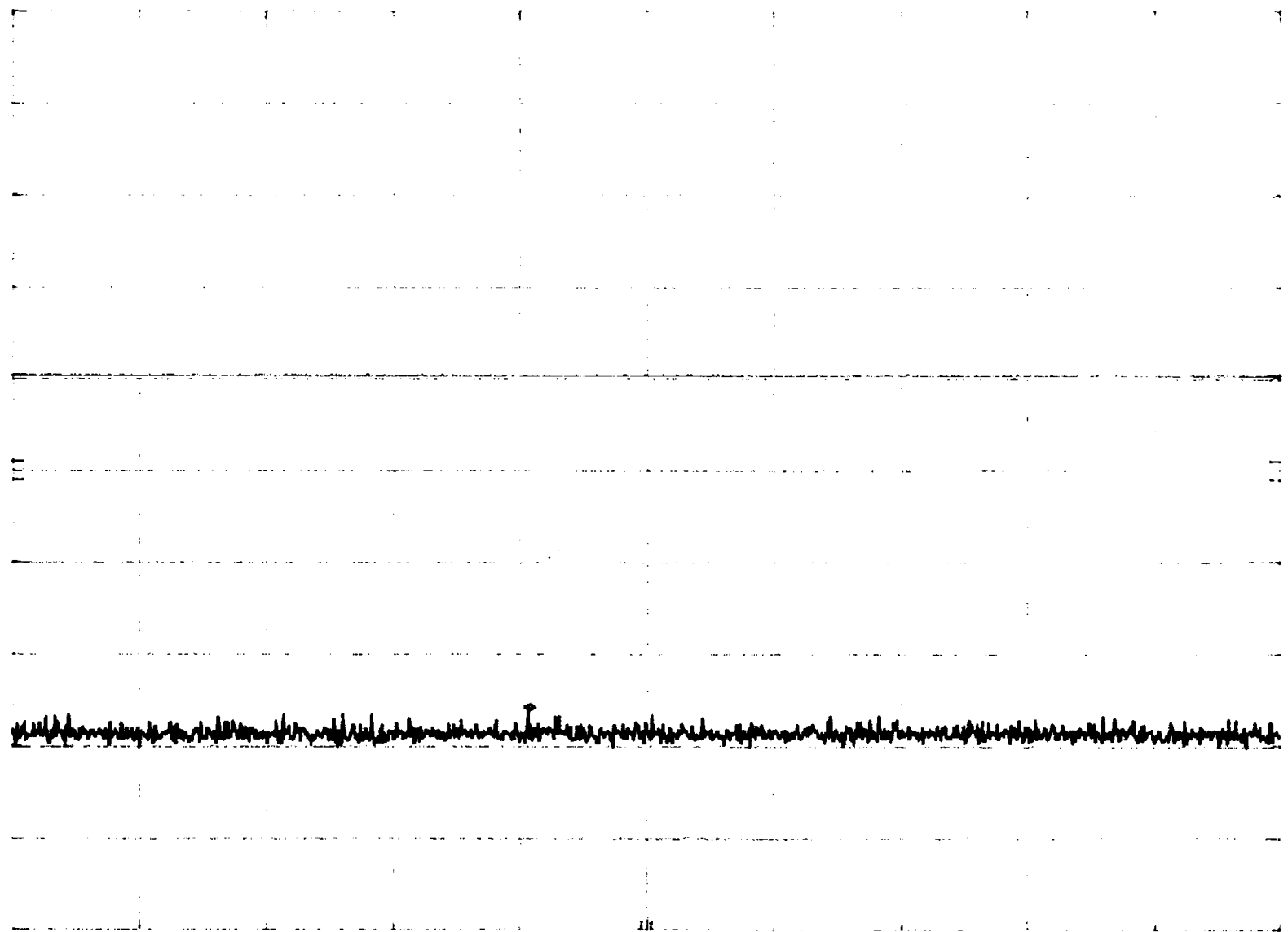
hp REF 48.0 dBm ATTN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 30 MHz

RES BW 100 KHZ

VBW 100 KHZ

STOP 500 MHz

SWP 141 msec *28*

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MKR 915.00 MHz
27.40 dBm

hp REF 48.0 dBm ATTN 40 dB

10 dB/

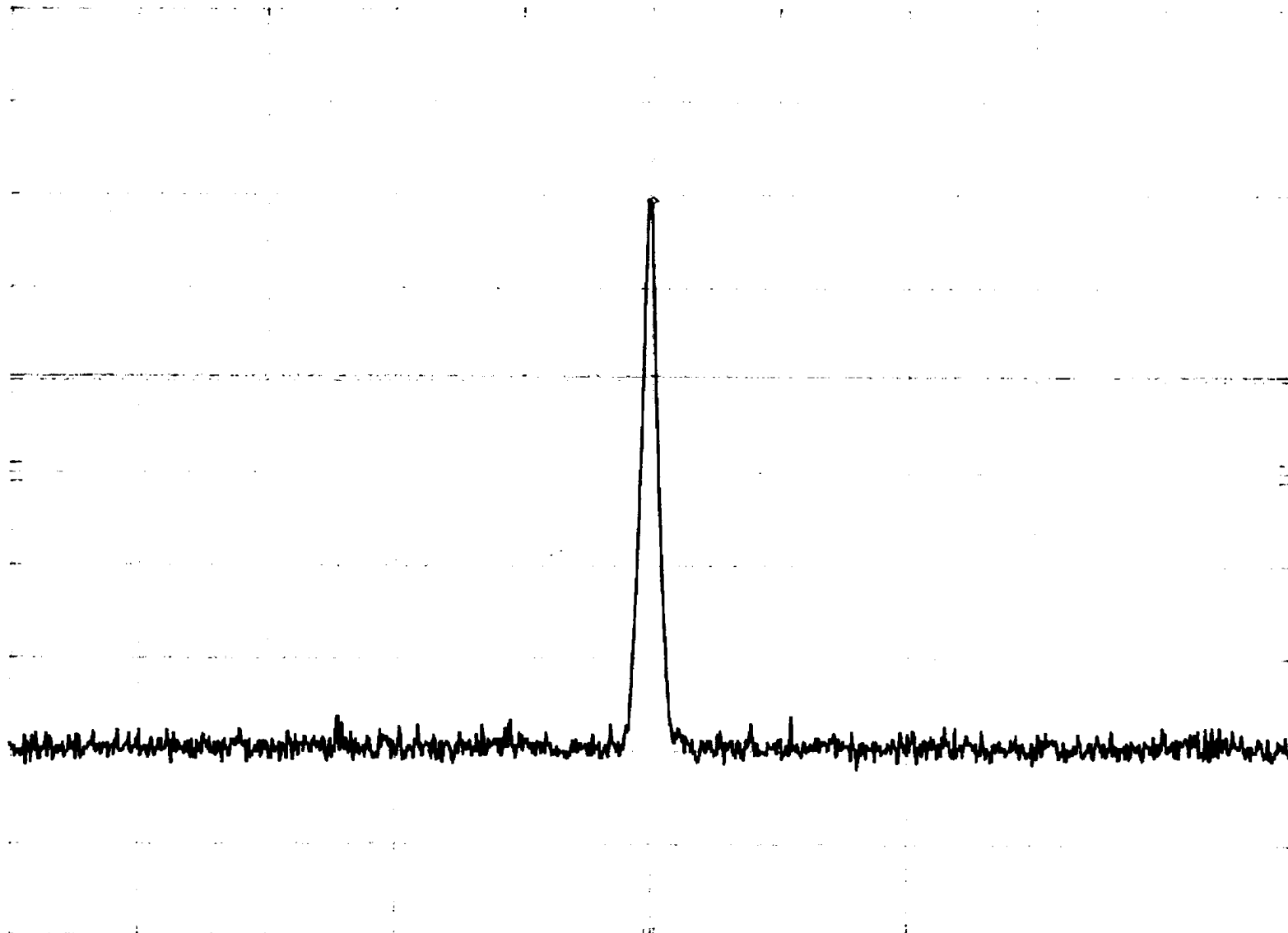
POS PK

OFFSET

18.0
dB

DL

8.4
dBm



START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz

SWP 20.0 msec *29*

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MFR 925.0 MHz
27.30 dBm

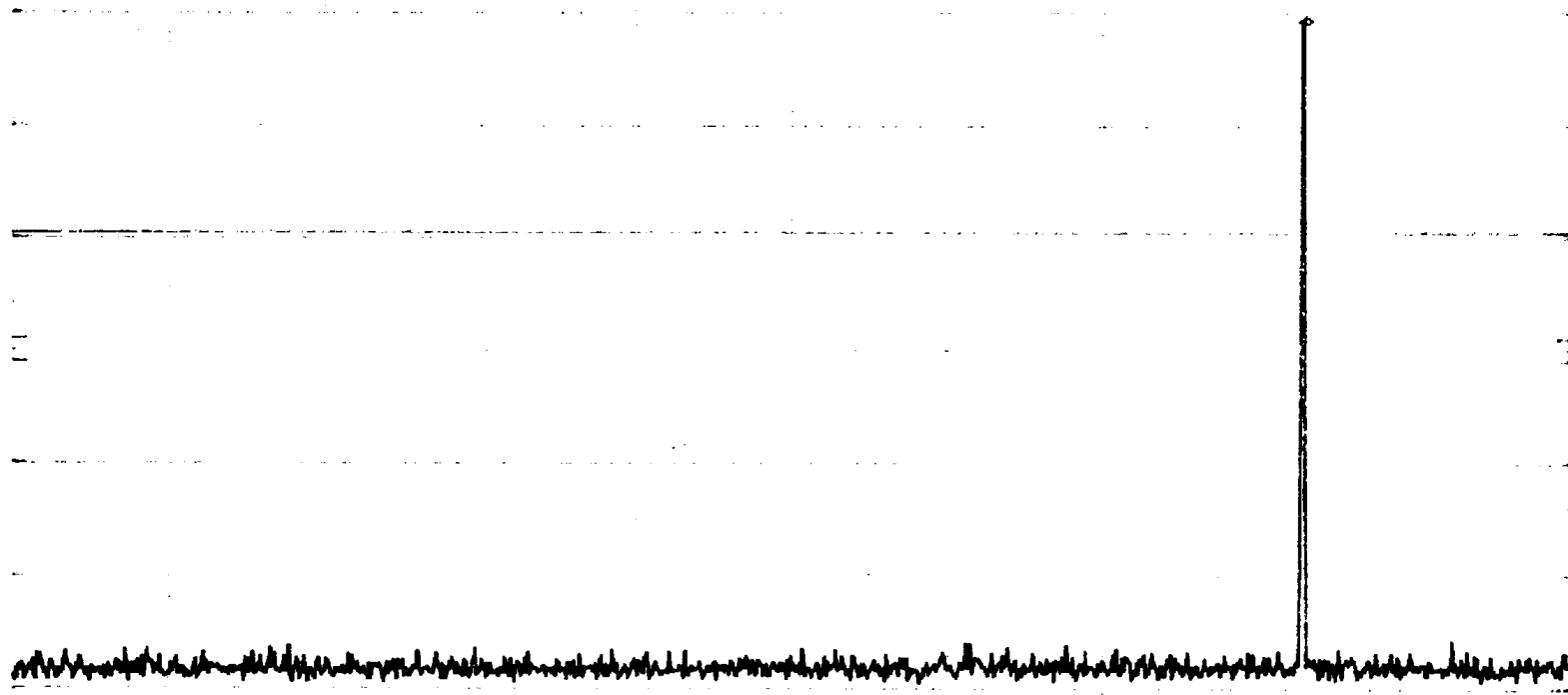
HP REF 48.0 dBm ATTN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 500 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 1.000 GHz

SWP 150 msec *30*

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MNR 1.876 GHz
-28.20 dBm

10 REF 48.0 dBm ATTN 40 dB

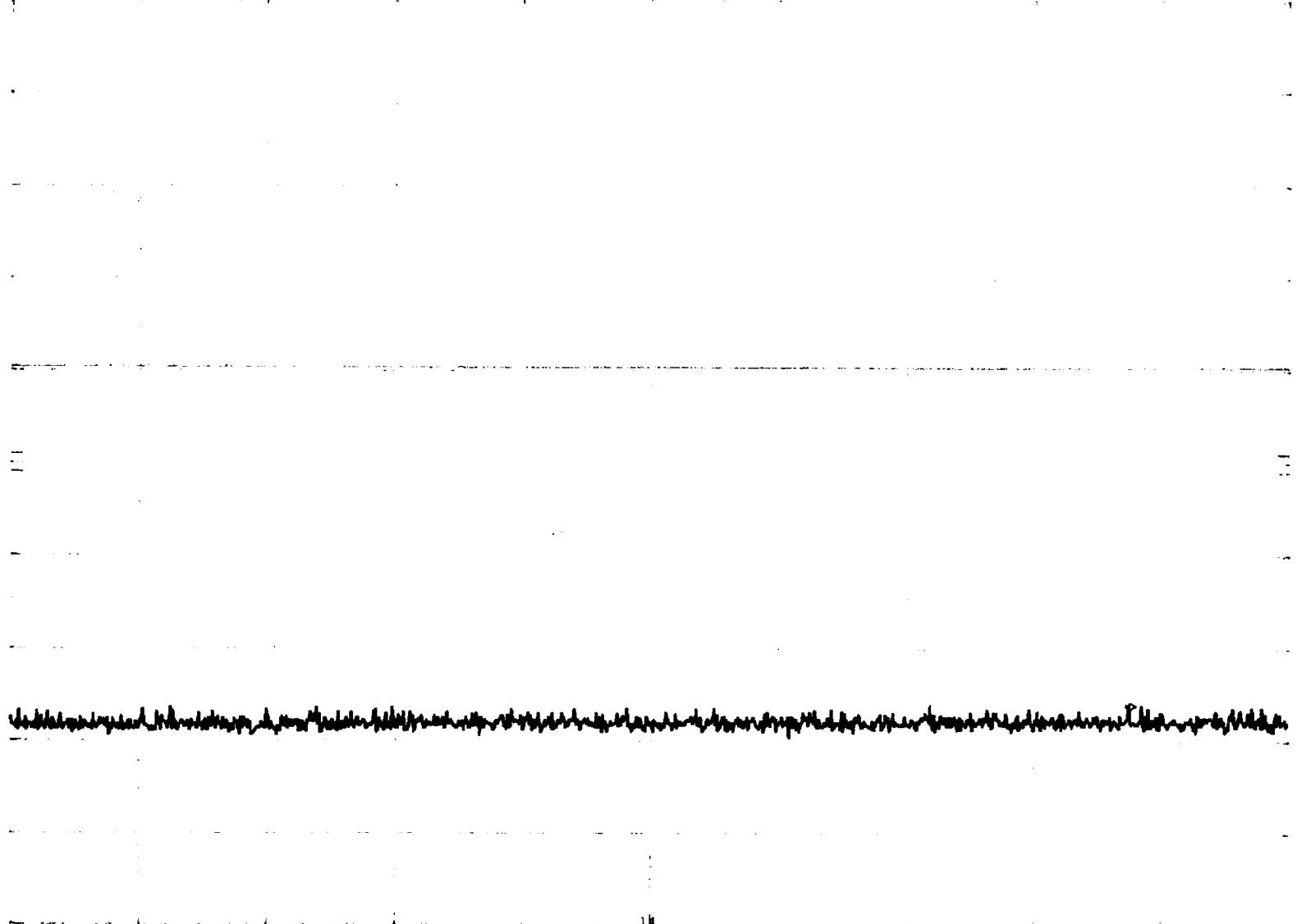
10 dB/

POS PK

OFFSET

18.0
dB

DL
8.4
dBm



START 1.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 2.00 GHz

SWP 300 msec *31*

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

FREQ 4.721 GHz
-28.30 dBm

hp REF 48.0 dBm ATTN 40 dB

10 dB/

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 2.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 5.00 GHz

SMP 900 msec *32*

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MARK 8.420 GHz
-22.00 dBm

hp REF 48.0 dBm ATTEN 40 dB

10 dB/

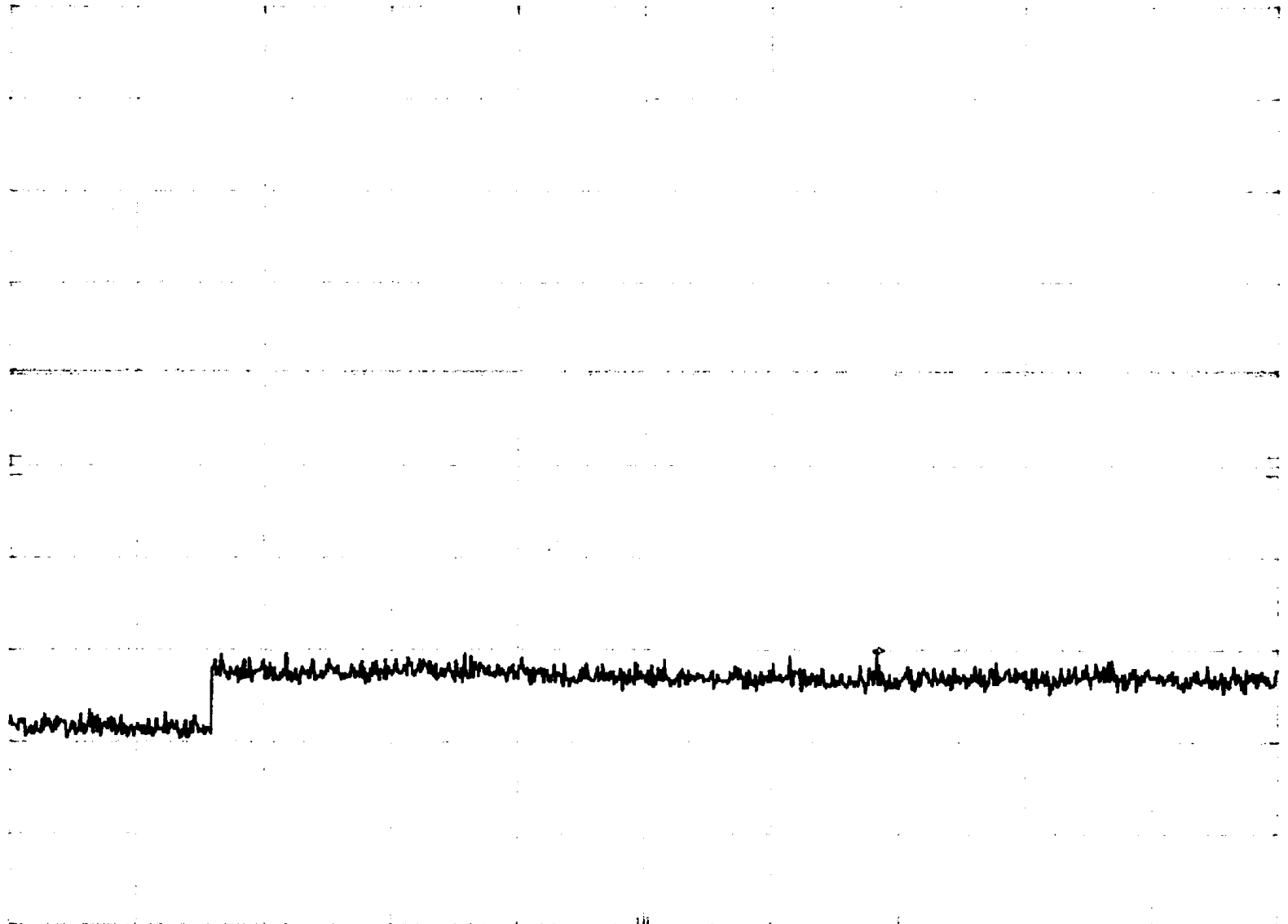
POS PK

OFFSET

18.0
dB

DL

8.4
dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz

SNP 1.50 sec *33*

CLIENT: *TI*
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MFR 312.5 MHz
-28.40 dBm

hp REF 48.0 dBm ATTEN 40 dB

10 dB/

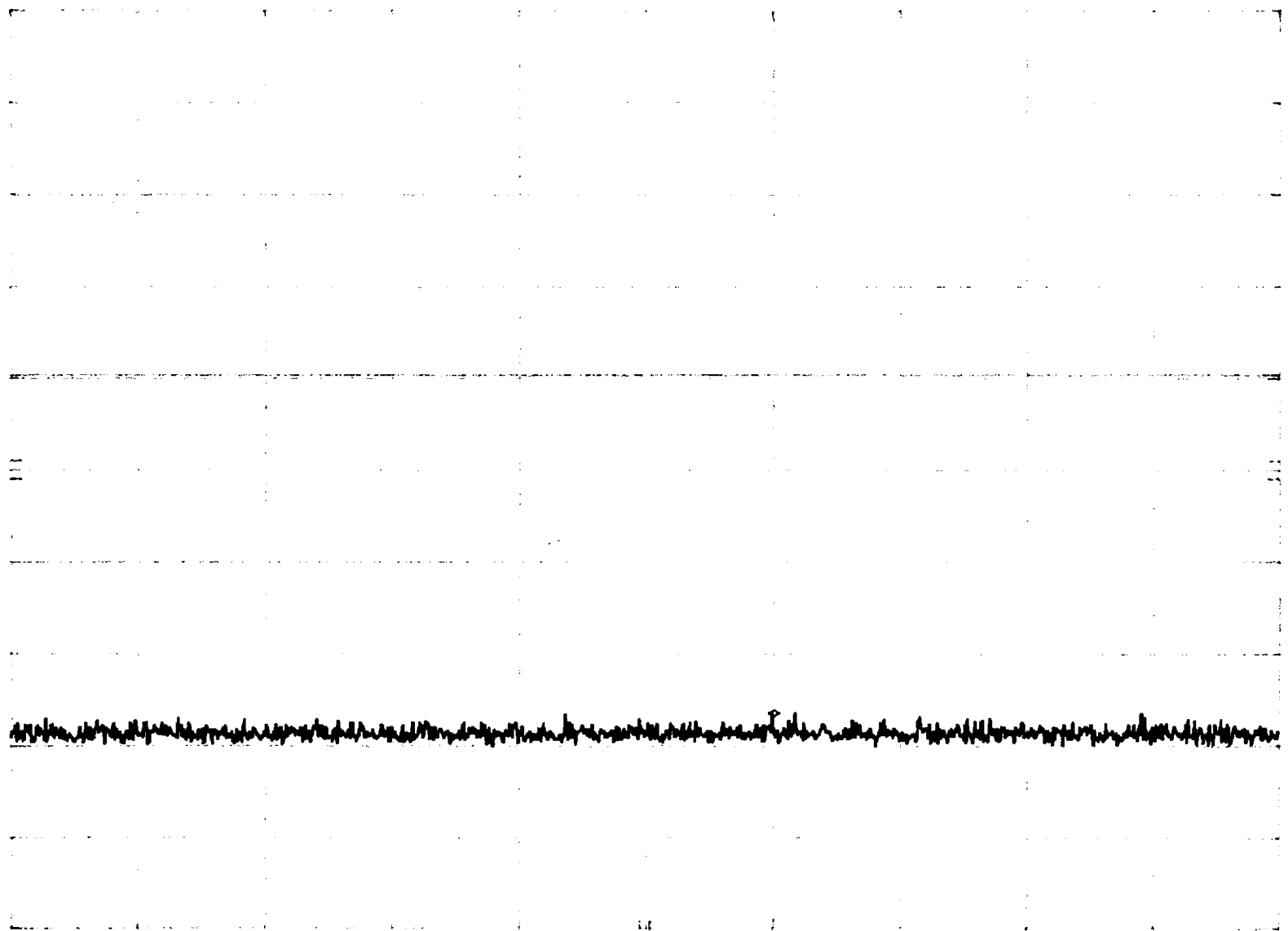
POS PK

OFFSET

18.0
dB

DL

8.4
dBm



START 30 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 500 MHz

SWP 141 msec

34

CLIENT: *TI*
NOTE(S): *Low*

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

FREQ 902.92 MHz
27.50 dBm

REF 48.0 dBm ATTN 40 dB

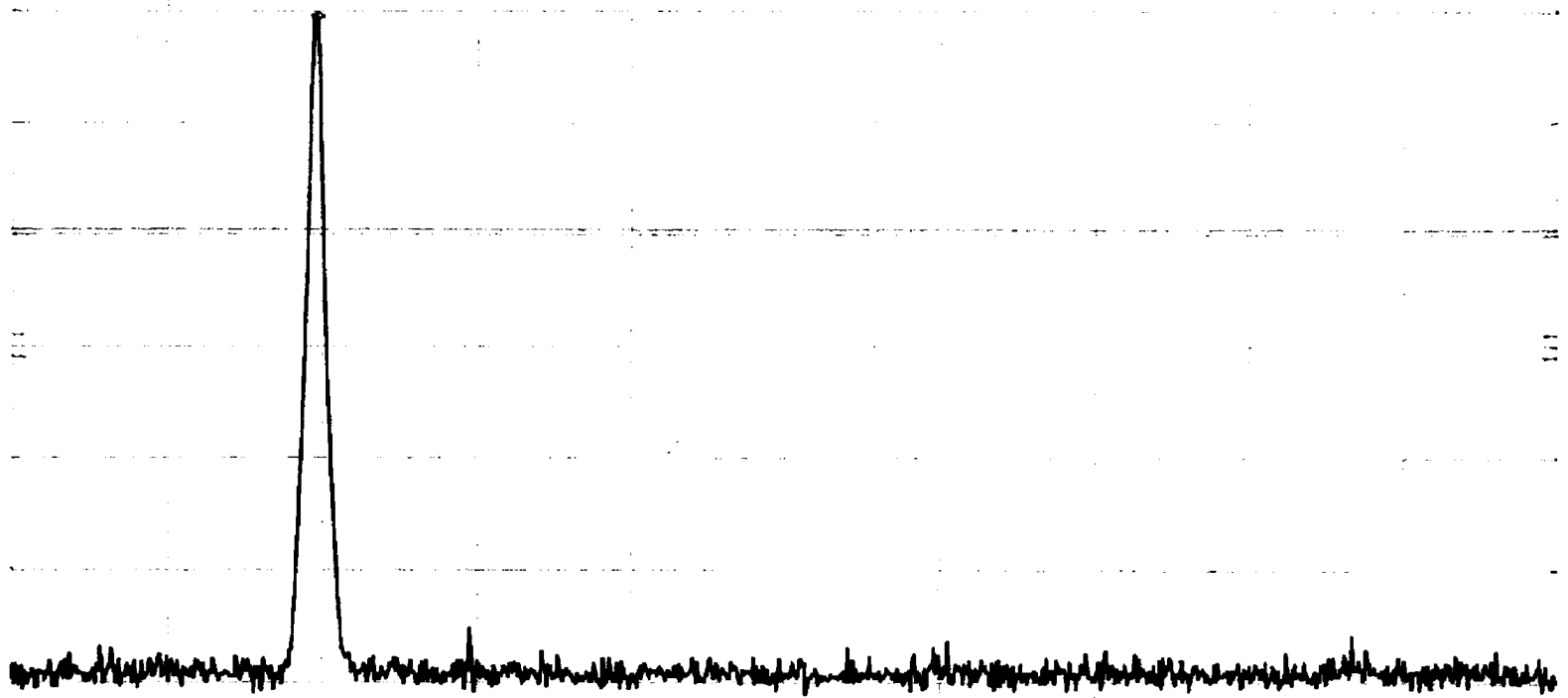
10 dB

POS PK

OFFSET

18.0
dB

DL
8.4
dBm



START 895.0 MHz

RES BW 100 kHz

VBW 100 kHz

STOP 935.0 MHz

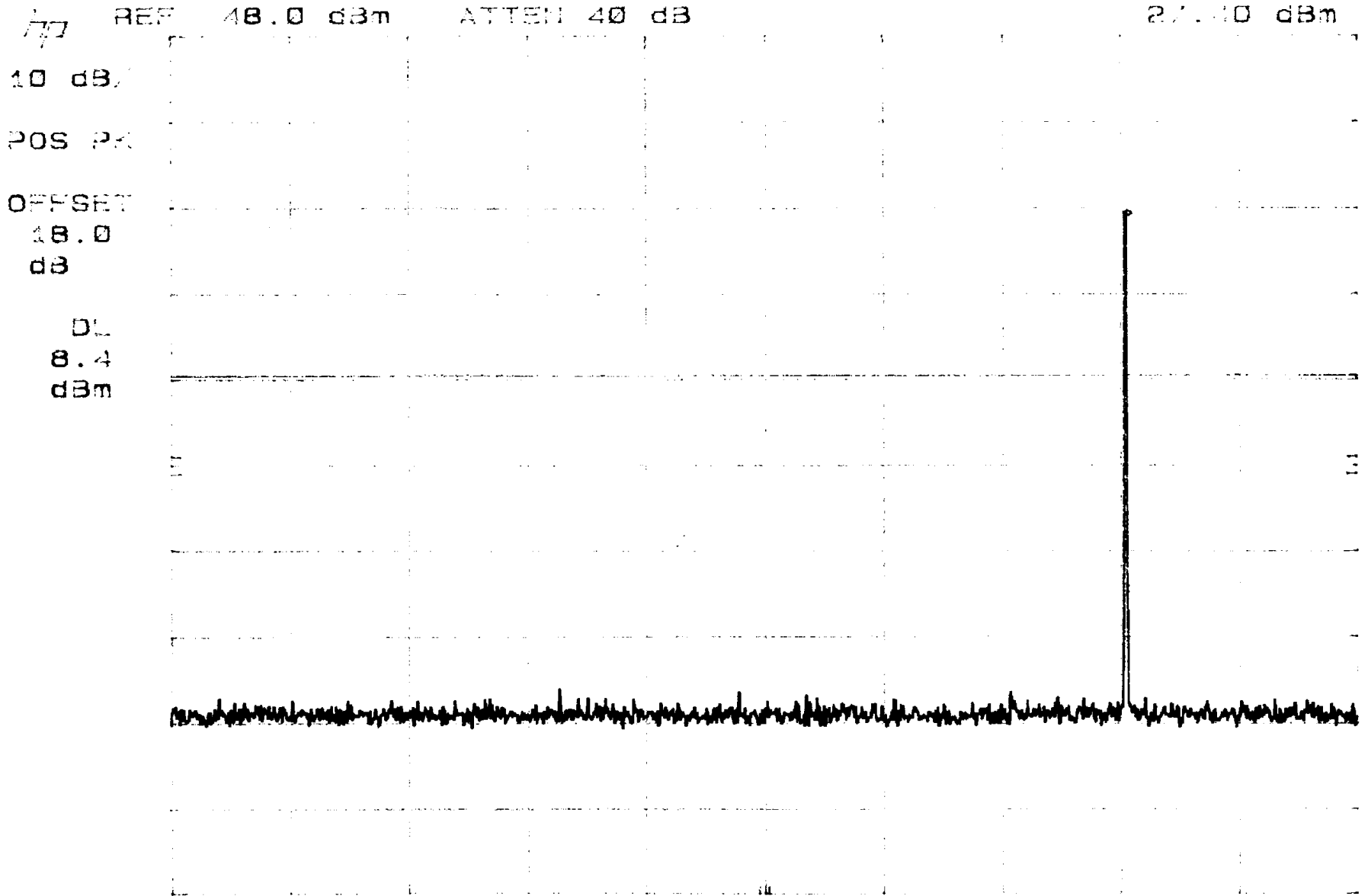
SWP 20.0 msec *35*

CLIENT: *TI*
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MFR 903.0 MHz
27.40 dBm



START 500 MHz

RES BW 100 KHz

VBW 100 KHz

STOP 1.000 GHz

SWP 150 msec

36

CLIENT: *TI*
NOTE(S): *Low*

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

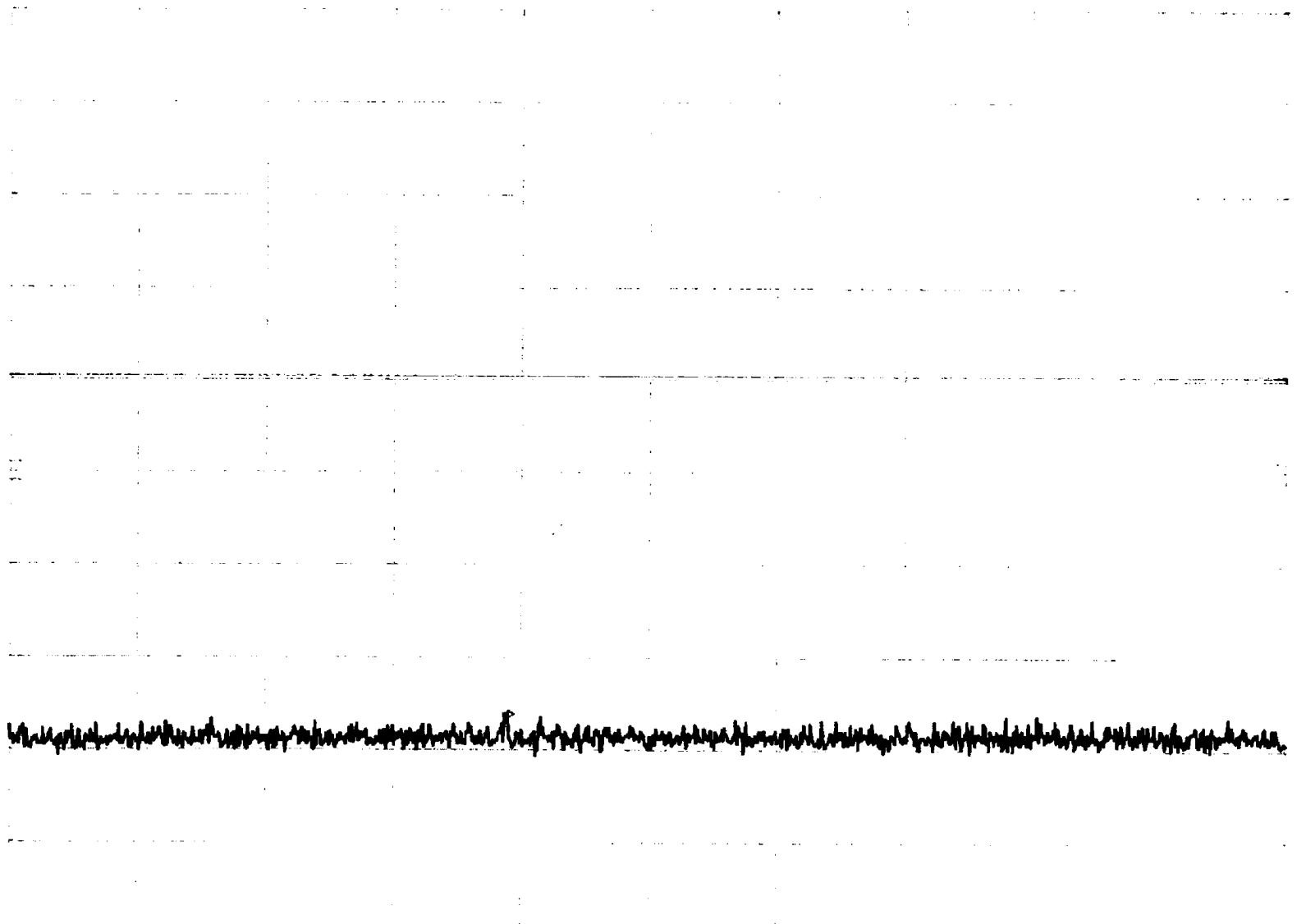
MNR 1.394 GHz
-28.20 dBm

REF 48.0 dBm ATTN 40 dB
10 dB

POS PK

OFFSET
18.0
dB

DL
8.4
dBm



START 1.00 GHz

RES BW 100 KHZ

VBW 100 KHZ

STOP 2.00 GHz
SWP 300 msec *37*

CLIENT: *TI*
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

FREQ 2.597 GHz
-27.00 dBm

REF 48.0 dBm ATTEN 40 dB

10 dB

POS PK

OFFSET

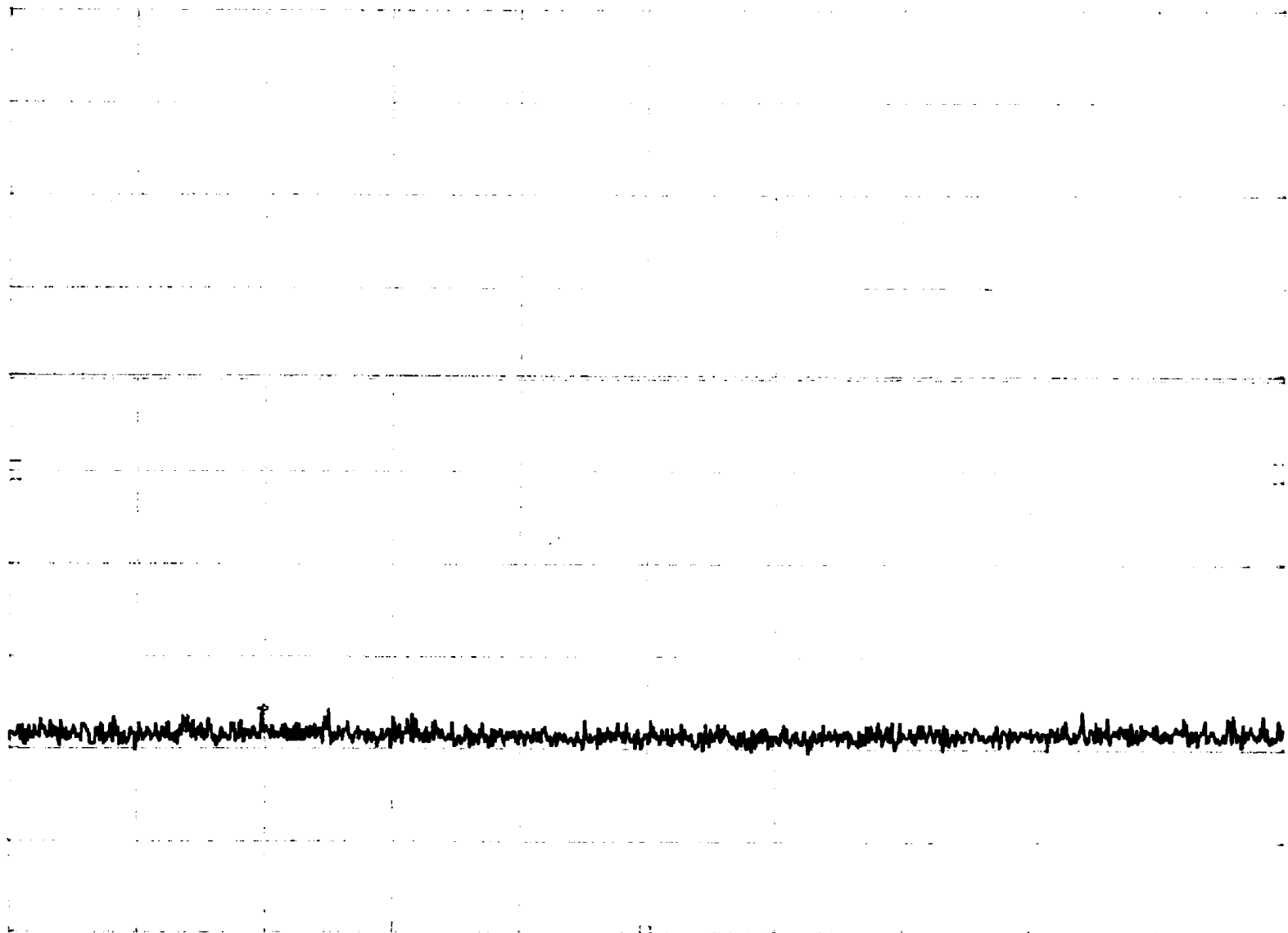
18.0

dB

DL

8.4

dBm



START 2.00 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 5.00 GHz

SWP 900 msec

38

CLIENT: **TI**
NOTE(S): Low

DATE: 10/16/00

SPECIFICATION: FCC Part 15, Para. 15.247(c)(1)

MAX 5.9.0 G
-22.20 dBm

REF 48.0 dBm ATTEN 40 dB

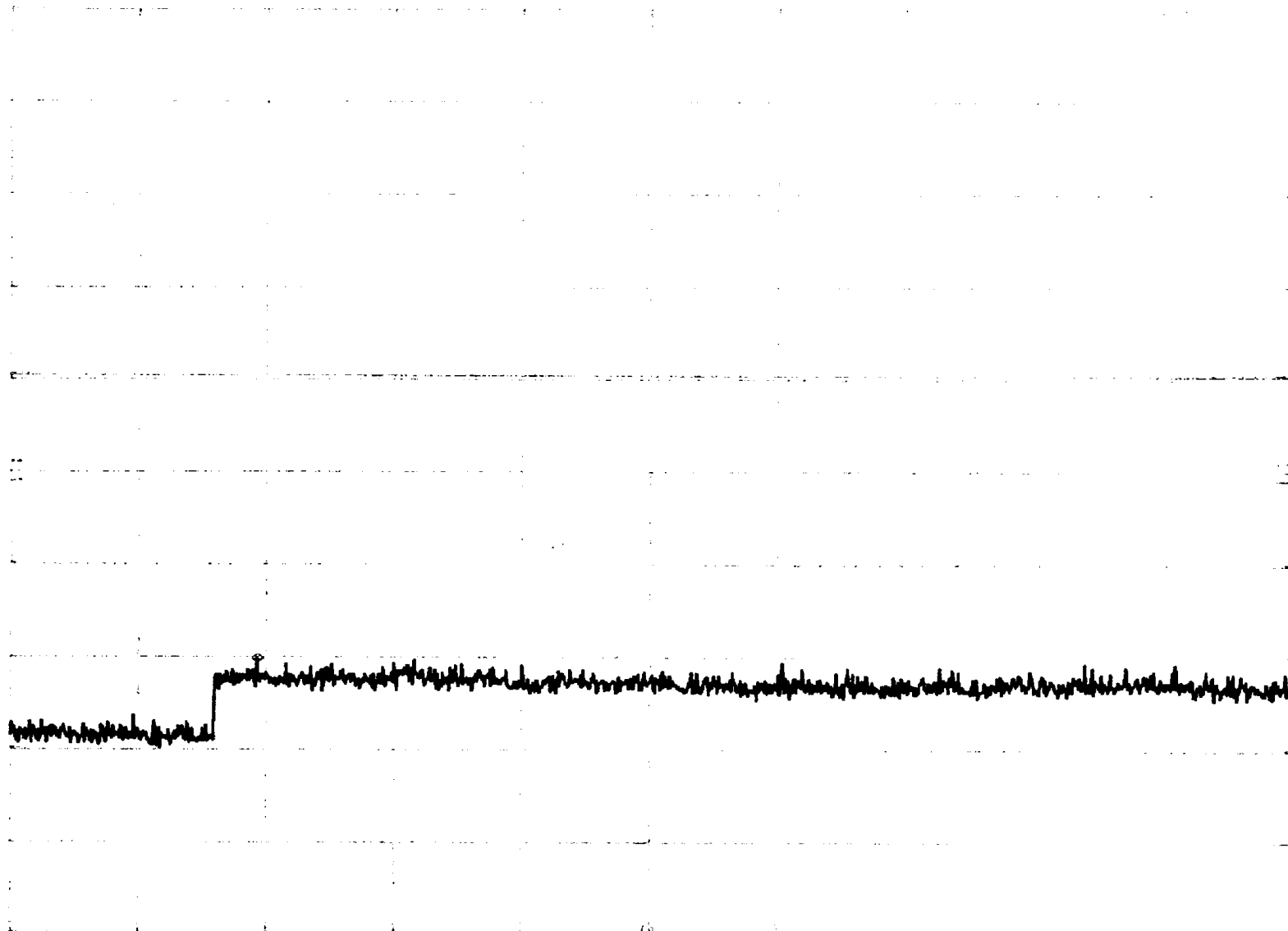
10 dB

POS PK

OFFSET

18.0
dB

JL
8.4
dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 20.00 G

SWP 1.50 sec

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7 SIGNATURE PAGE

GENERAL REMARKS:

SUMMARY:

All tests according to *FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)* were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the requirements of *FCC Part 15, Paragraphs 15.209(b); 15.247(a)(i); (a)(1); (b)(2)*.

- **Does not** fulfill the general approval requirements cited on page 1.

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Jim Owen
(EMC Engineer)