

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		

TABLE OF CONTENTS

	Pages
1 GENERAL INFORMATION	3
1.1 Product Description	3
1.2 Related Submittal Grant	6
1.3 Tested System Details	6
1.4 Test Methodology	6
1.5 Test Facility	6
1.6 System Information	7
2 SYSTEM TEST CONFIGURATION	8
2.1 Justification	8
2.2 EUT Exercise Software	8
2.3 Special Accessories	8
2.4 Equipment Modifications	8
2.5 Configuration of Tested System	8
3 RADIATED EMISSION EQUIPMENT/DATA	9
Field Strength Calculation	13
4 CONDUCTED EMISSION EQUIPMENT/DATA	14
5 Signature page	40

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	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
RS-232	☐	☒	1	☐	☒			Metalized 9-pin D-sub	Characteristic Impedance	4	☒	☐
RF	☒	☐	9	☒	☐	braid	coaxial	SMA	50 ohm	2	☒	☐
Power cord	☒	☐	1	☐	☐			Universal Power Cord	Characteristic Impedance	2	☒	☐

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	☒ 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(e)**
 EUT Serial #: **U5190013**
 Manufacturer: **TI**
 EUT Description: **9 Antenna RF Identification Transceiver**
 Notes:

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

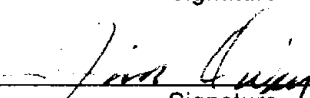
Level Key	
Pk – Peak	Nb – Narrow Band
Qp – QuasiPeak	Bb – Broad Band
Av – Average	

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

Reviewed by: **Jim Owen**
 Printed


 Signature

10

Radiated Electromagnetic Emissions



Test Report #: **S0414 Run 1**

Test Area: Site 3 Roof

Temperature: 25 °C

Test Method: FCC Part 15 **15.209(a)**

Test Date: 16-Oct-2088

Relative Humidity: 45 %

EUT Model #: **57000 15.205(d) 15.247(e)**

EUT Power: 115 Vac to 9 VDC Power Converter

Air Pressure: 100.1 kPa

EUT Serial #: U5190013

Page: 1 of 2

Manufacturer: **TI**

EUT Description: 9 Antenna RF Identification Transceiver

Notes:

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

FREQ	LEVEL	CABLE / ANT / PREAMP	FINAL	POL / HGT / AZ	DELTA1 (dB)	DELTA2 (dB)
(MHz)	(dBuV)	(dB) (dB/m) (dB)	(dBuV/m)	(m) (DEG)	FCC A (> 1GHz)	N/A
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

11

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

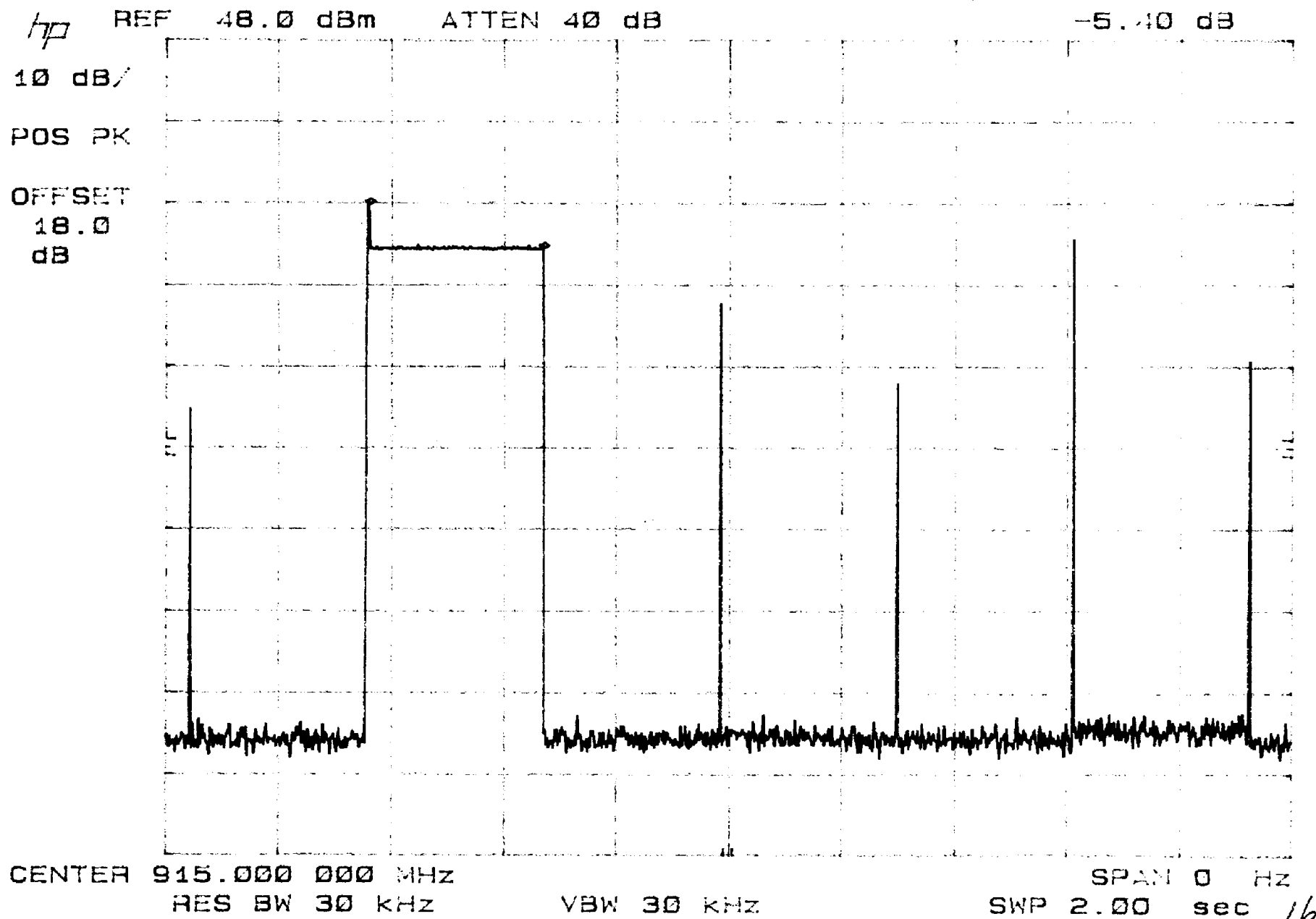
Test Equipment Used :

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* DATE: 10/16/00 SPECIFICATION: FCC Part 15, Para. 15.247(a)(1)(i)
NOTE(S): 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



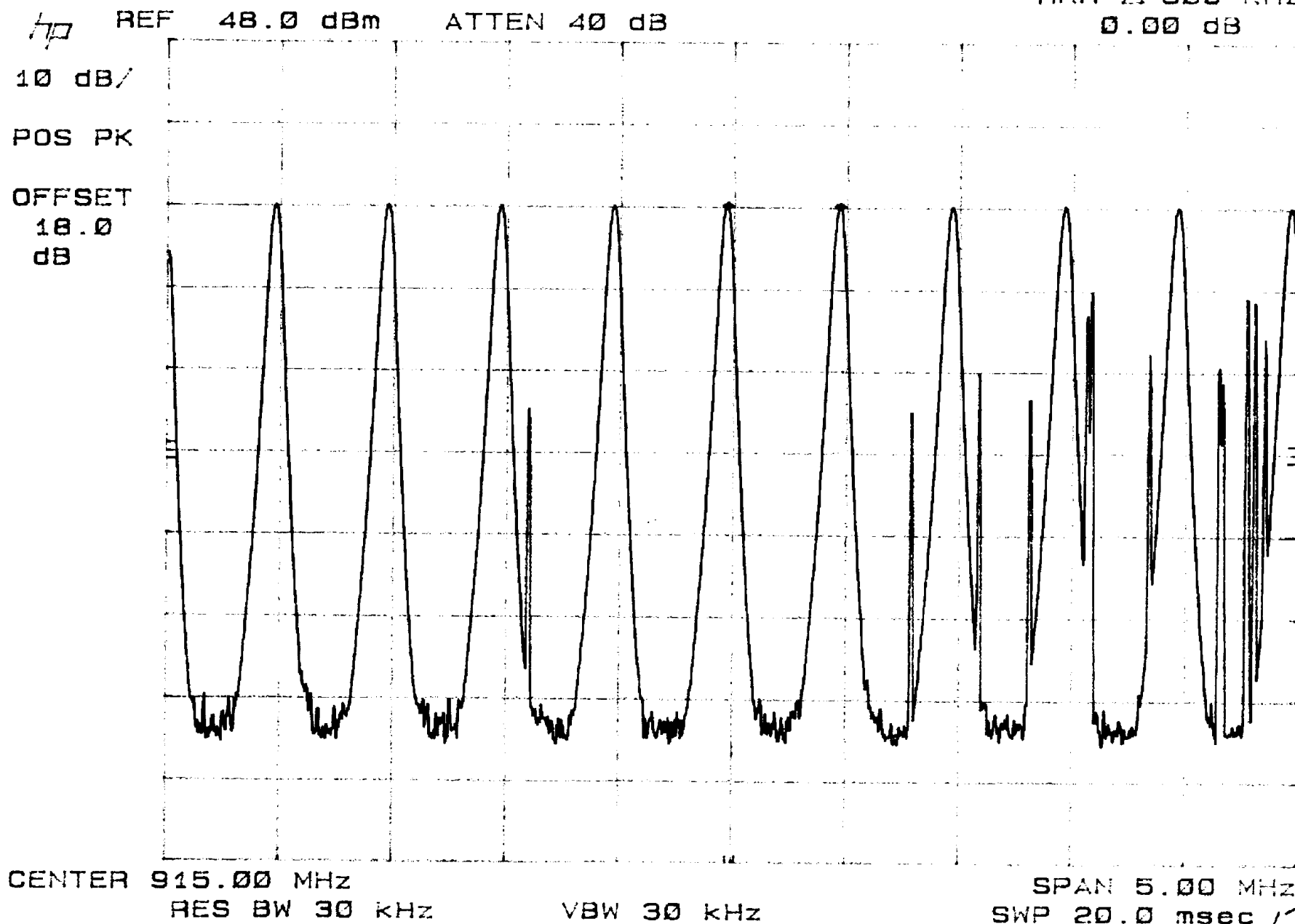
CLIENT: *TI*
NOTE(S):

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

HP REF 40.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET

10.0
dB

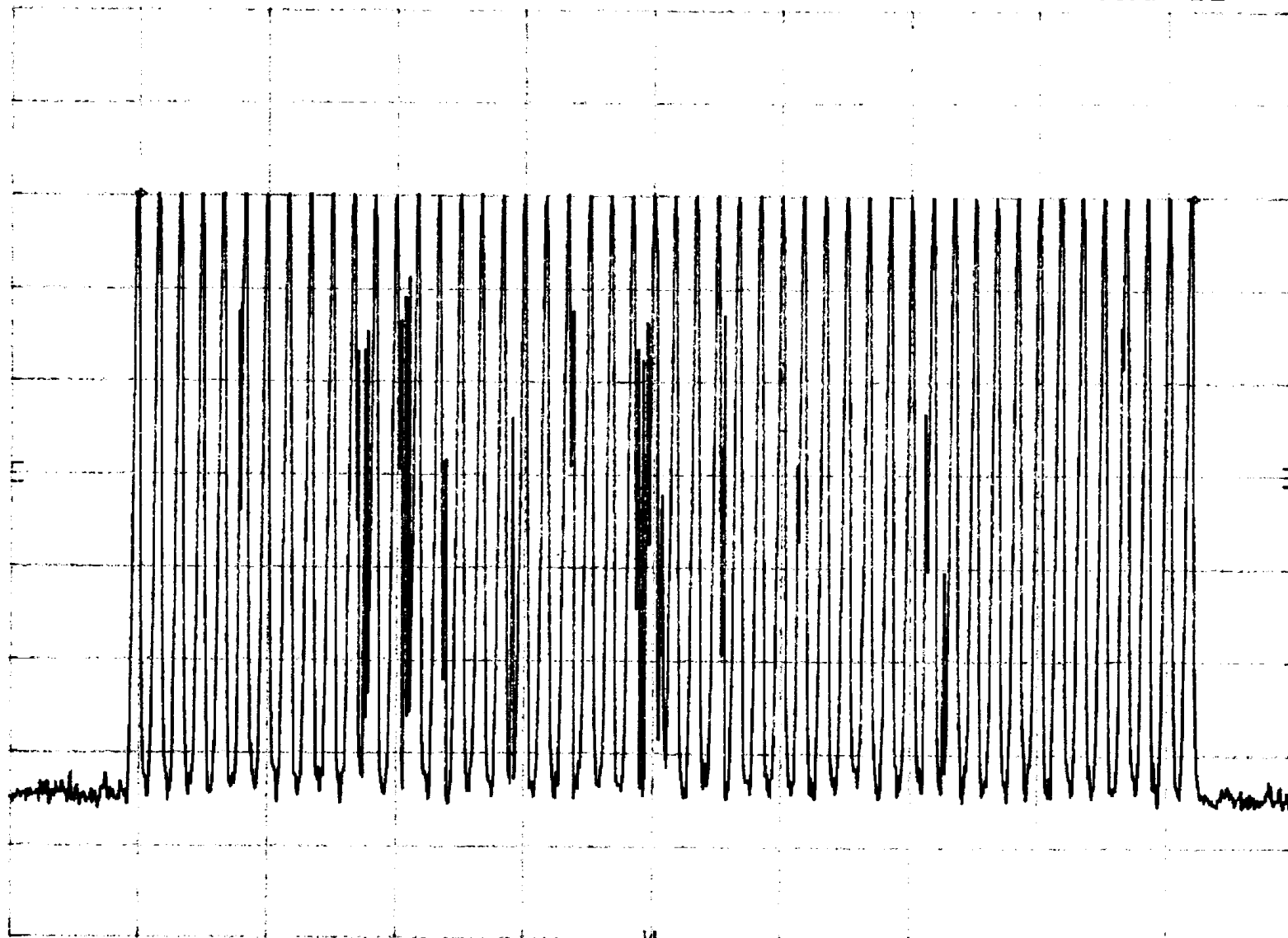
START 900.0 MHz

RES BW 30 kHz

VBW 30 kHz

STOP 930.0 MHz

SWP 90.0 msec *18*



CLIENT: *TI*
NOTE(S):

DATE: 10/16/00
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

CSP 500.0 KHz

VA SB

SC FC

CORR

CENTER 902.9740 MHz

#RES BW 10 KHz

#VBW 100 KHz

SPAN 200.0 KHz

SNP 30.0 msec

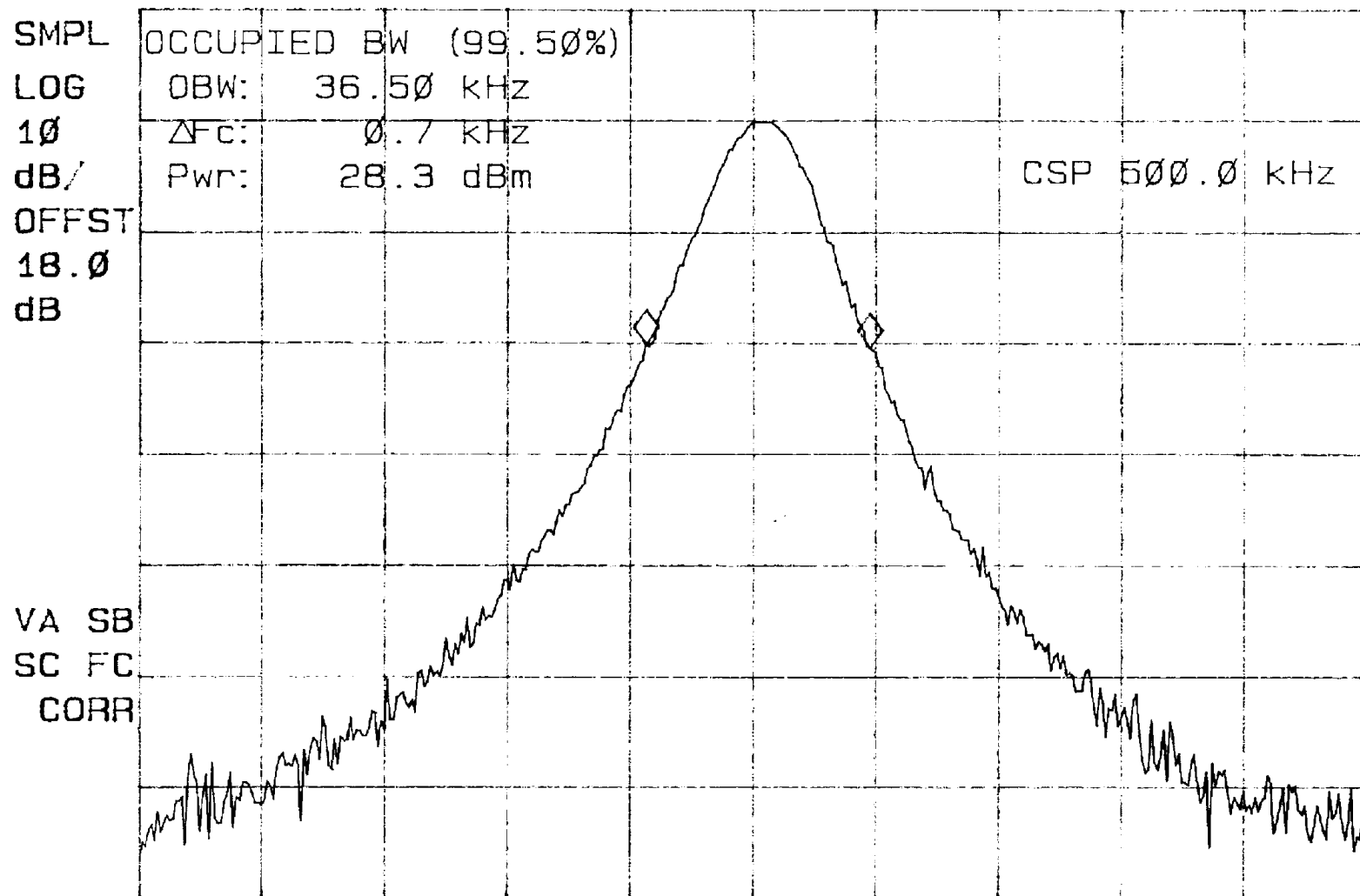
19

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

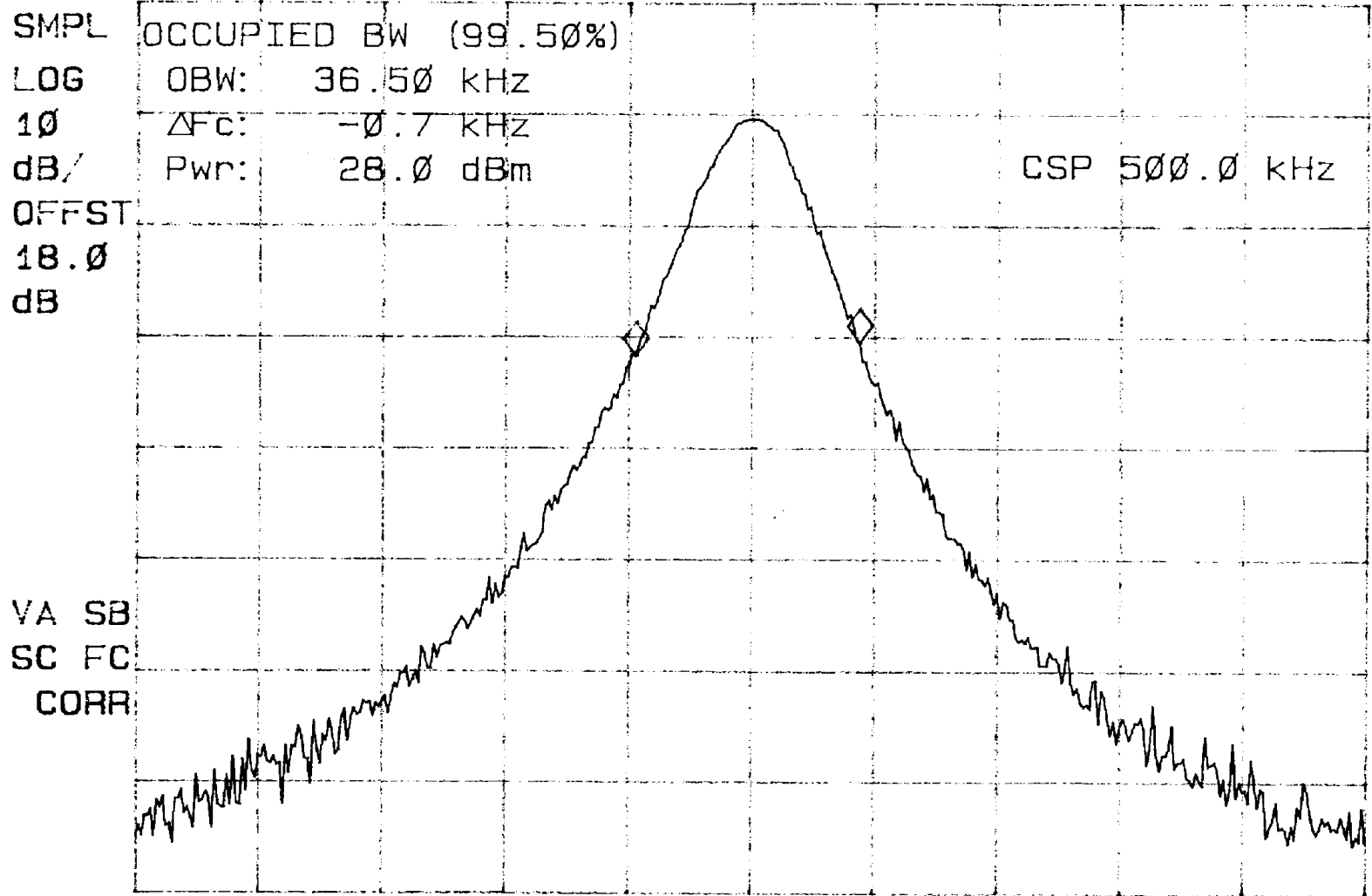
CLIENT: *TI*
NOTE(S):

- DATE: 10/16/00
1. 20 dB bandwidth
2. Power output

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

11:20:12 OCT 16, 2000
TP

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*
NOTE(S):

DATE: 10/16/00
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

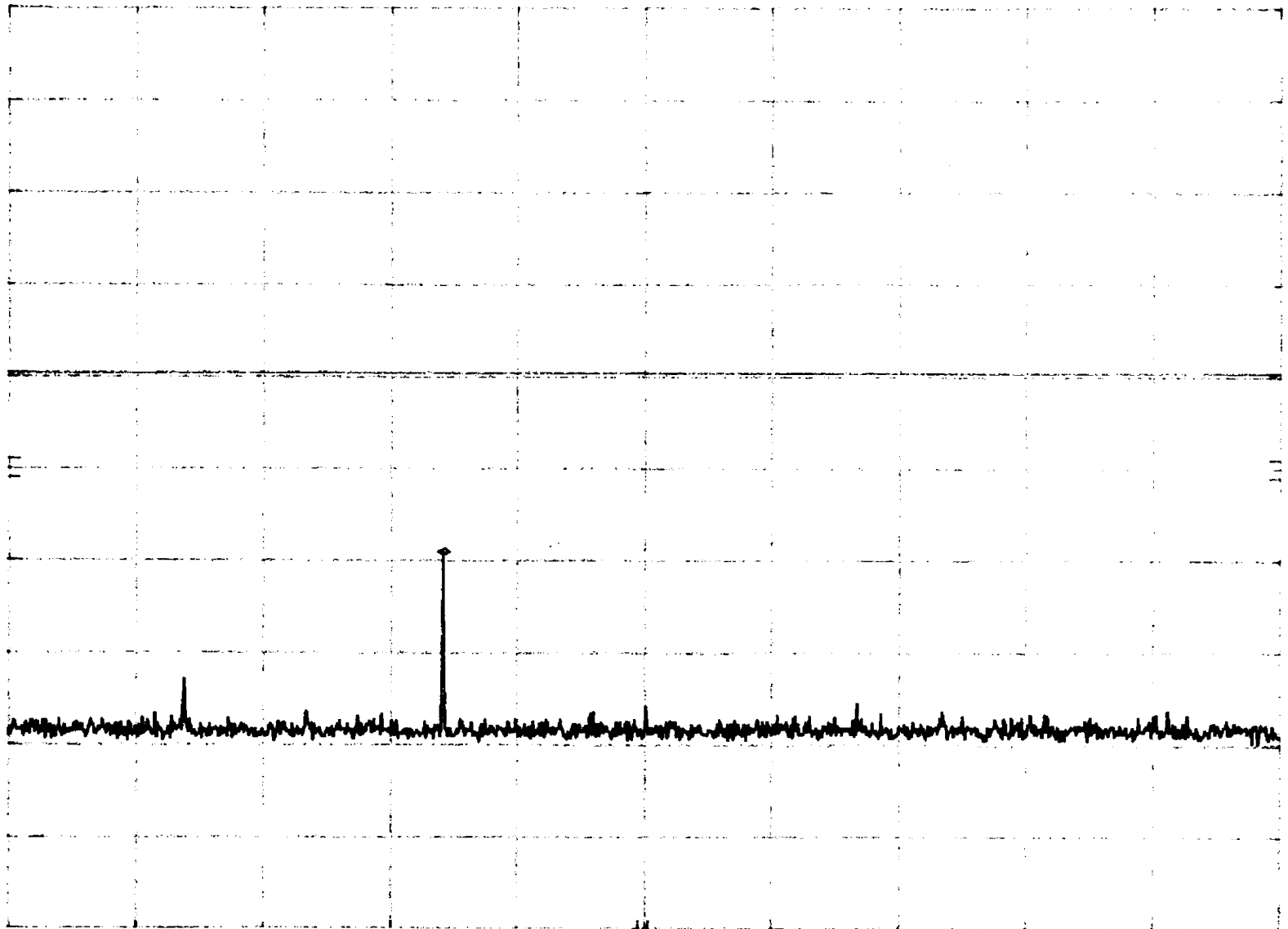
18.0

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 ATTN 40 dB

10 dB/

POS PK

OFFSET

18.0
dB

DL
8.4
dBm

MARKER

736.5 MHz
-4.60 dBm

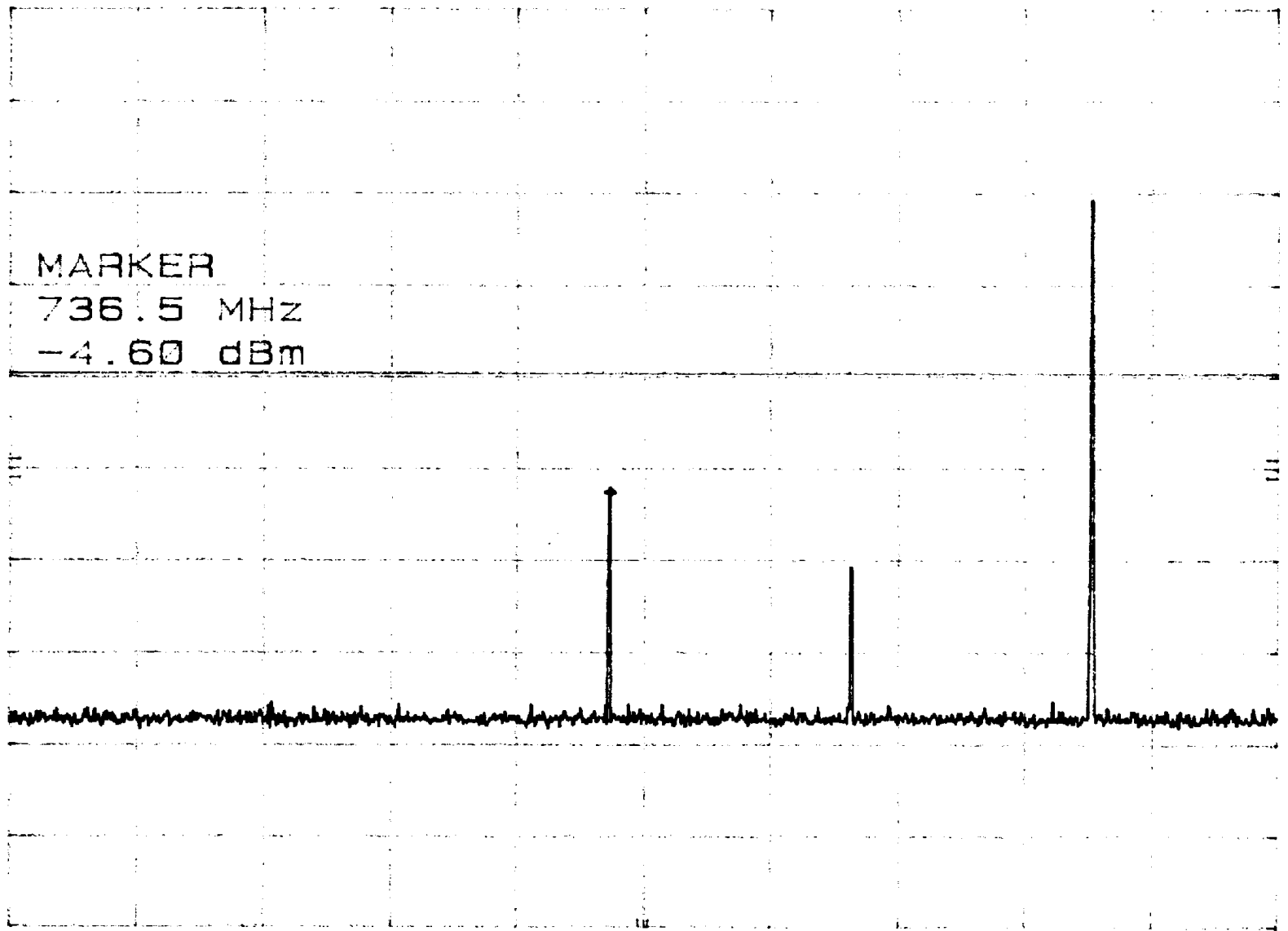
START 500 MHz

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

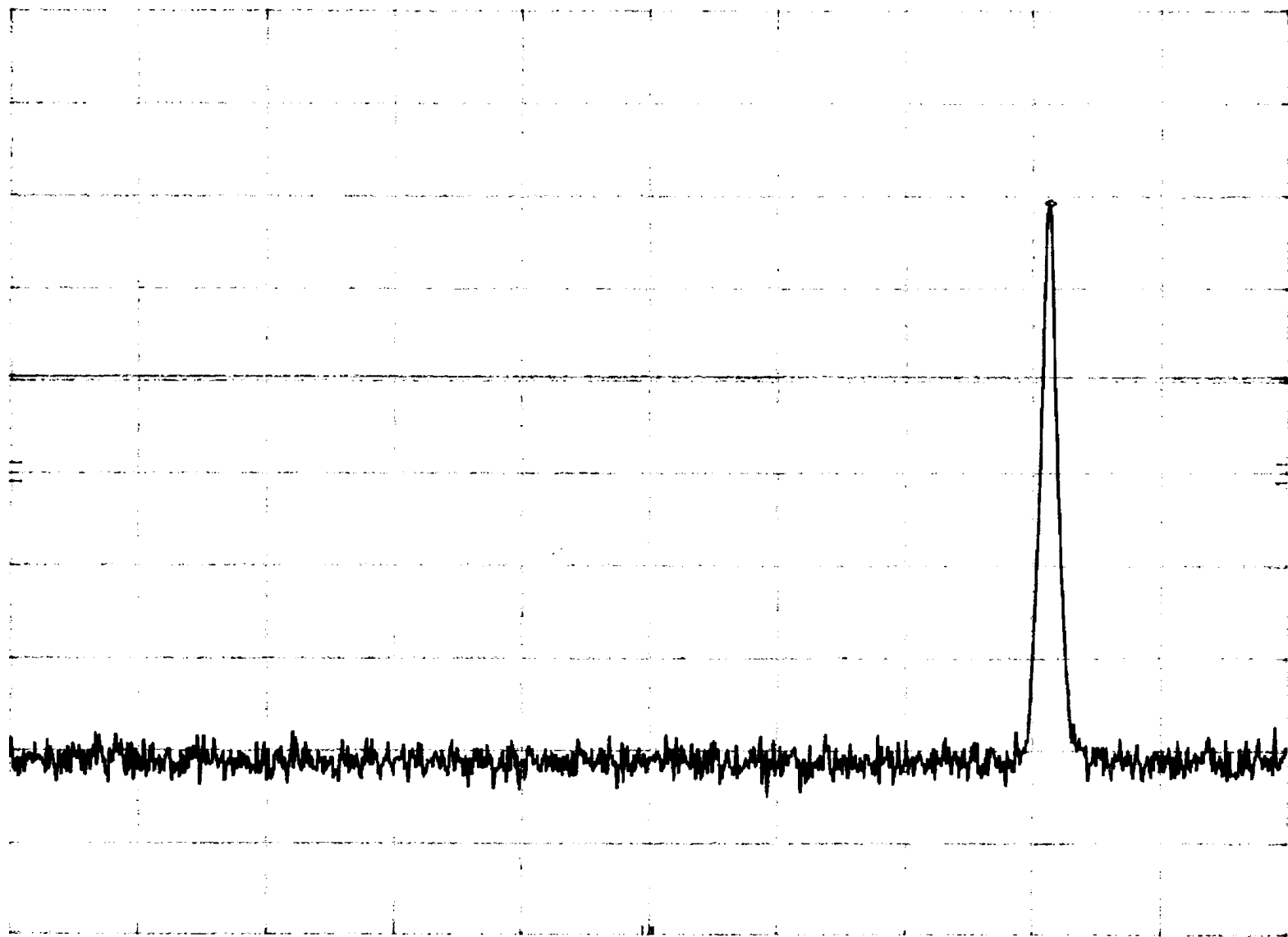
HP REF 48.0 dBm ATTEN 40 dB

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 *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 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

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

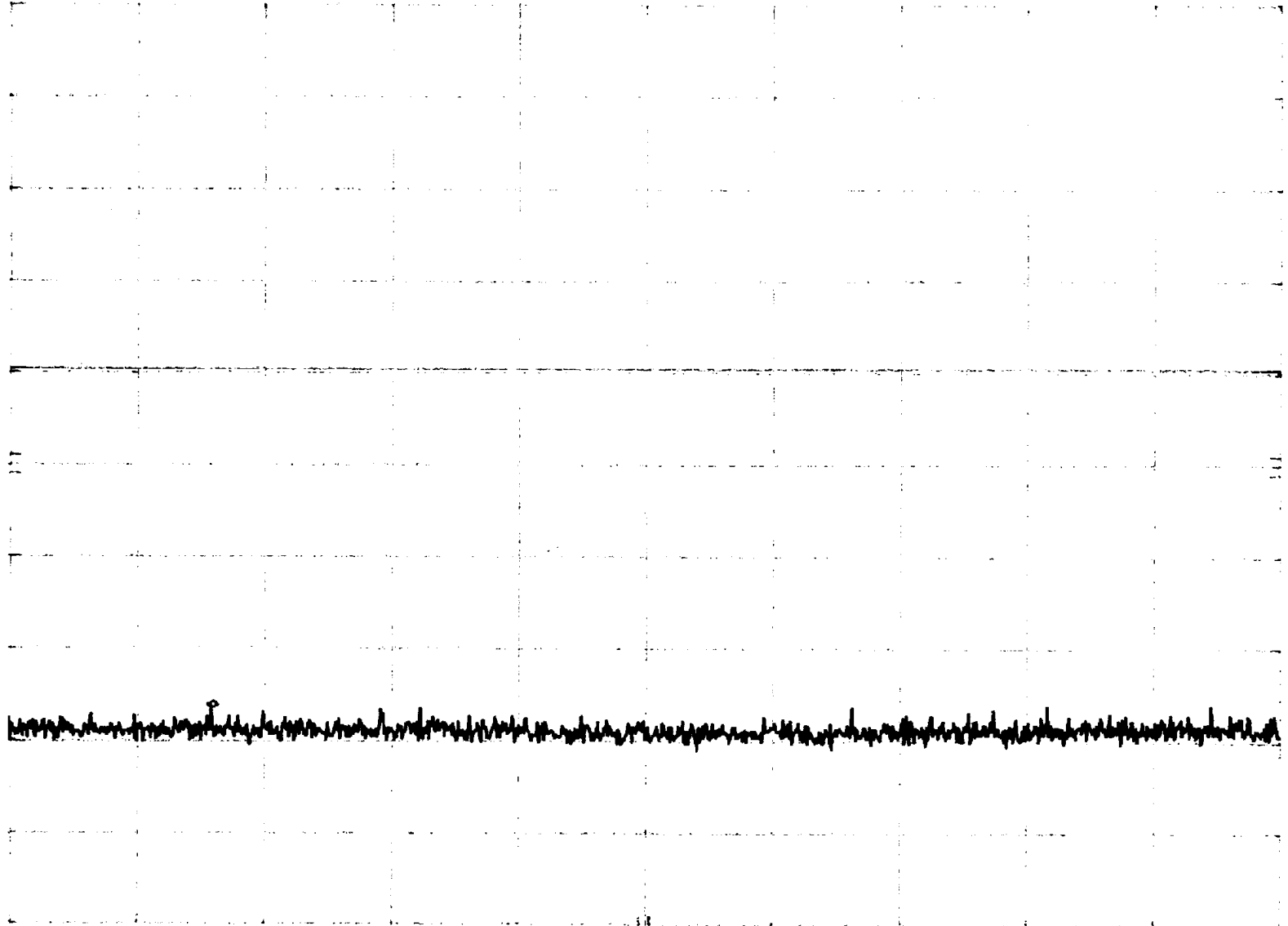
10 dB/

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

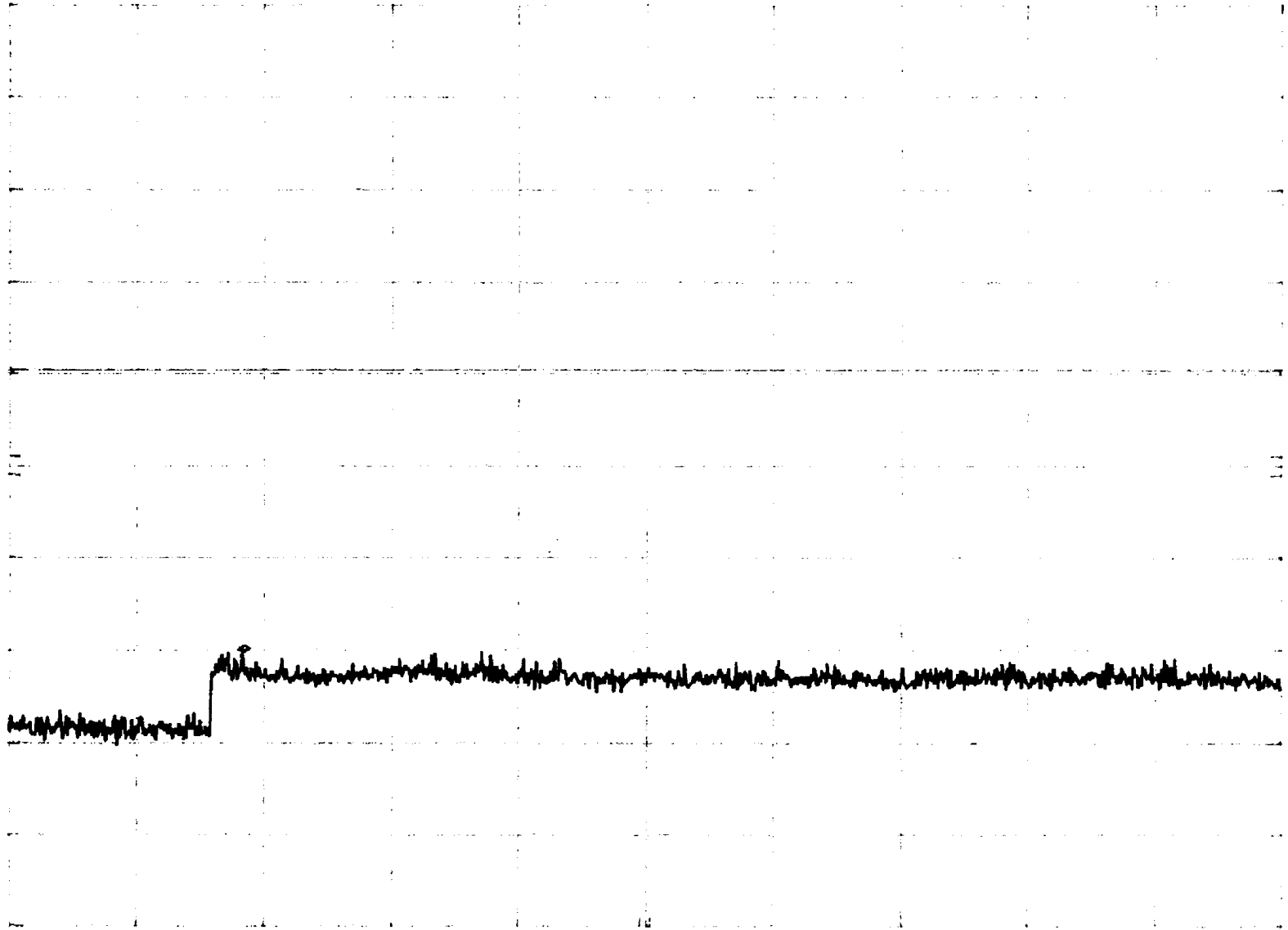
DL
8.4
dBm

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

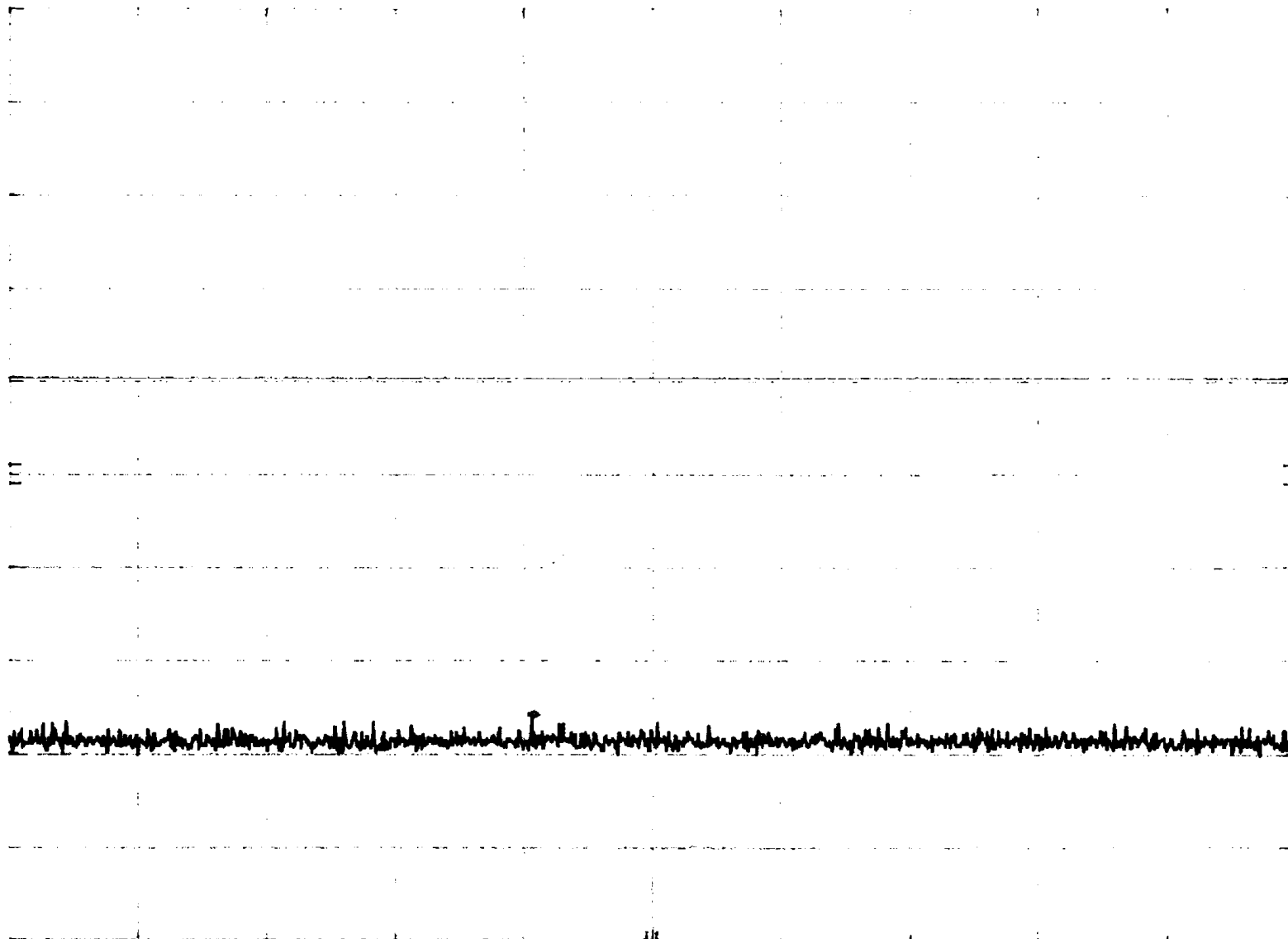
18.0

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

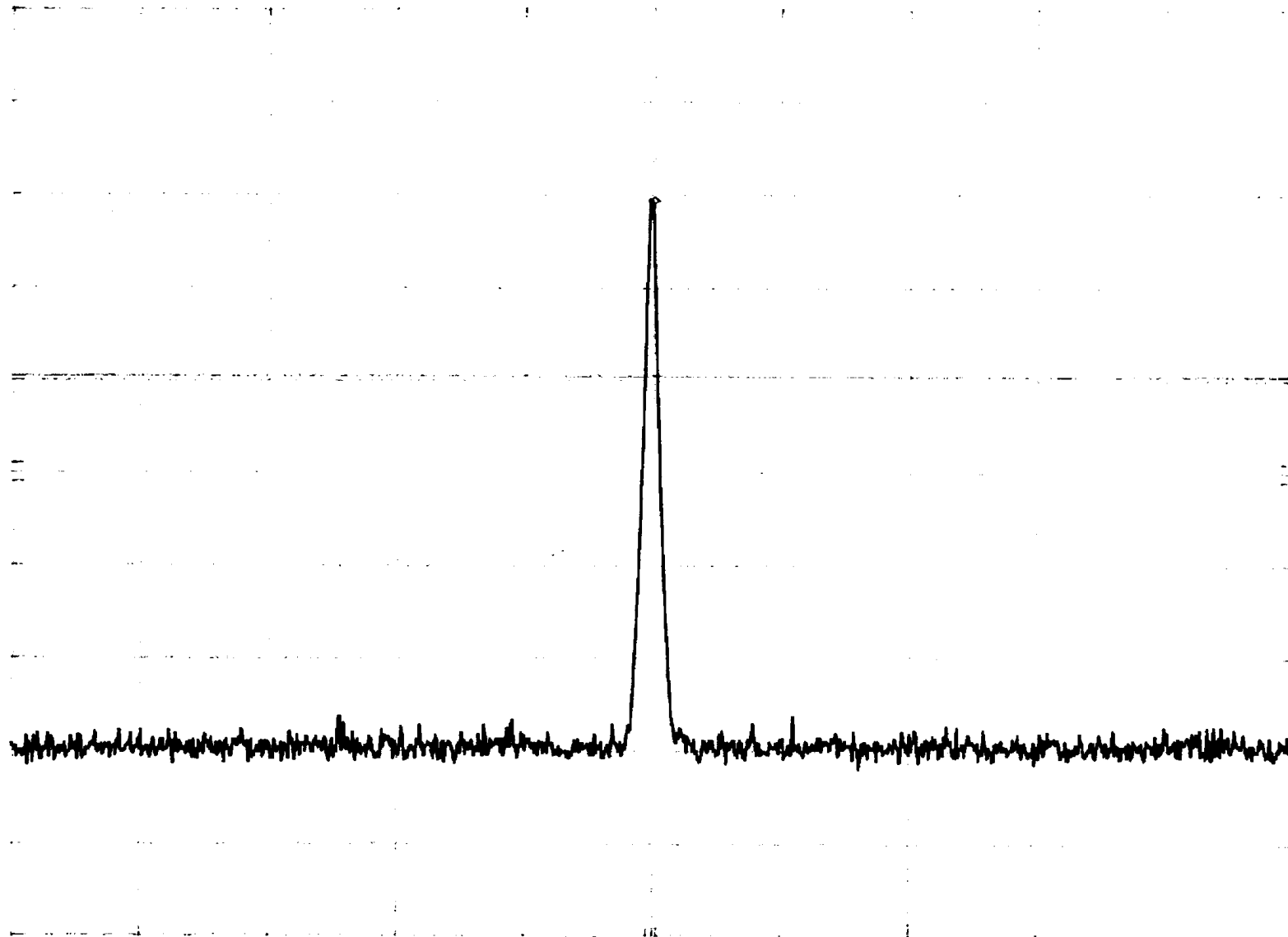
10 dB/

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)

MKR 925.0 MHz

27.30 dBm

7P 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)

MSR 1.876 GHz
-28.20 dBm

70 REF 48.0 dBm ATTN 40 dB

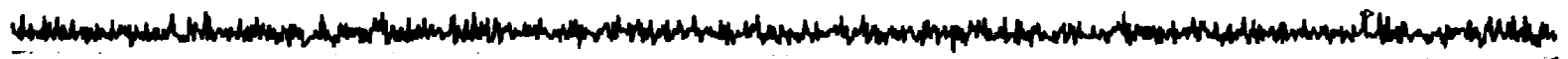
10 dB/

POS PK

OFFSET

18.0
dB

CL
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

SWP 900 msec

32

CLIENT: *TI*
NOTE(S): Medium

DATE: 10/16/00

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

NR 8.420 GHz
-22.00 dBm

hp REF 48.0 dBm ATTN 40 dB

10 dB/

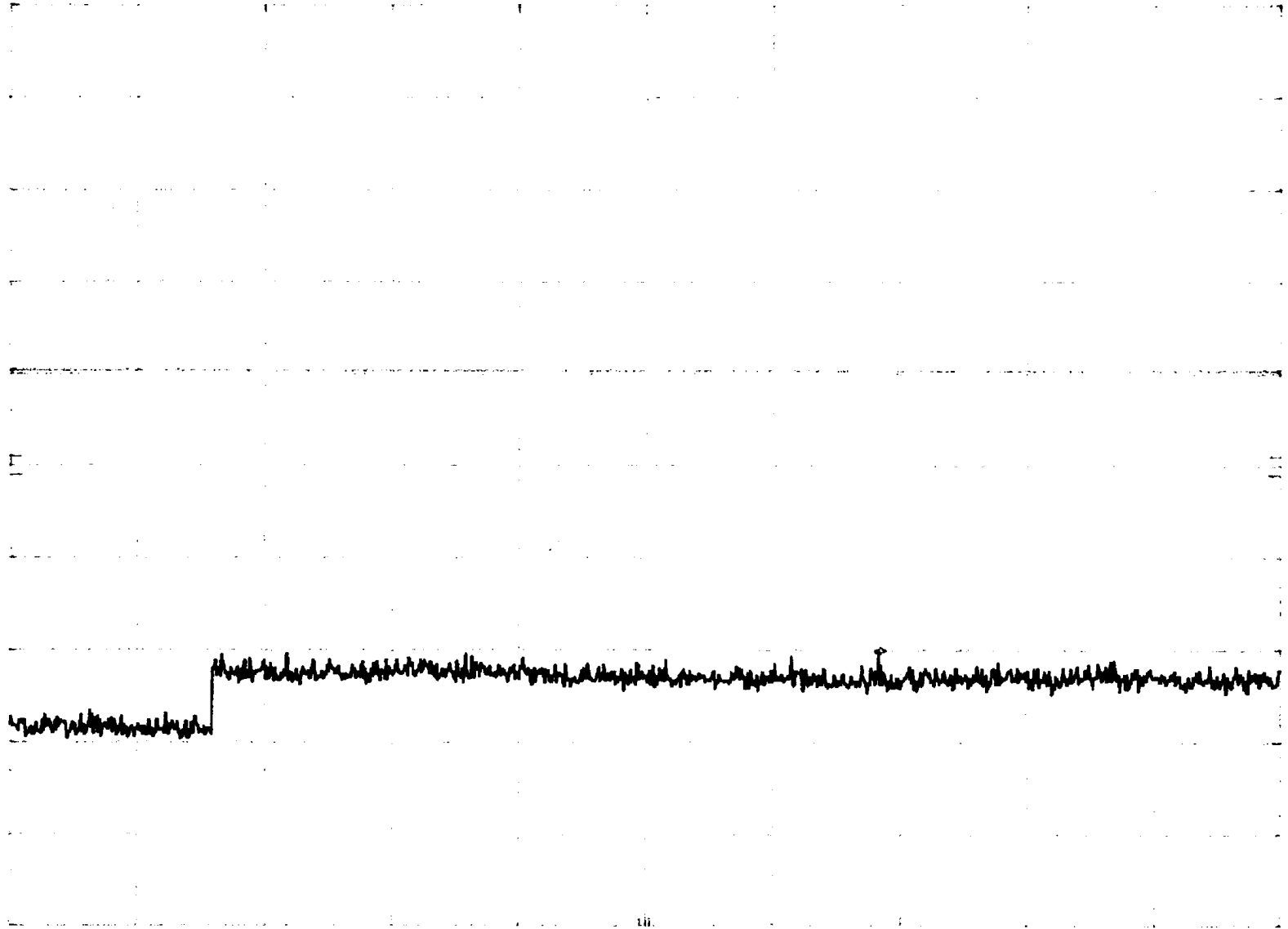
POS PK

OFFSET

18.0
dB

DL

8.4
dBm



START 5.00 GHz

RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz
SNP 1.50 sec *33*

CLIENT: *TI*
NOTE(S): Low

DATE: 10/16/00

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

MRB 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)

MRB 902.92 411
27.50 dBm

REF 48.0 dBm ATTN 40 dB

10 dB

POS PK

OFFSET

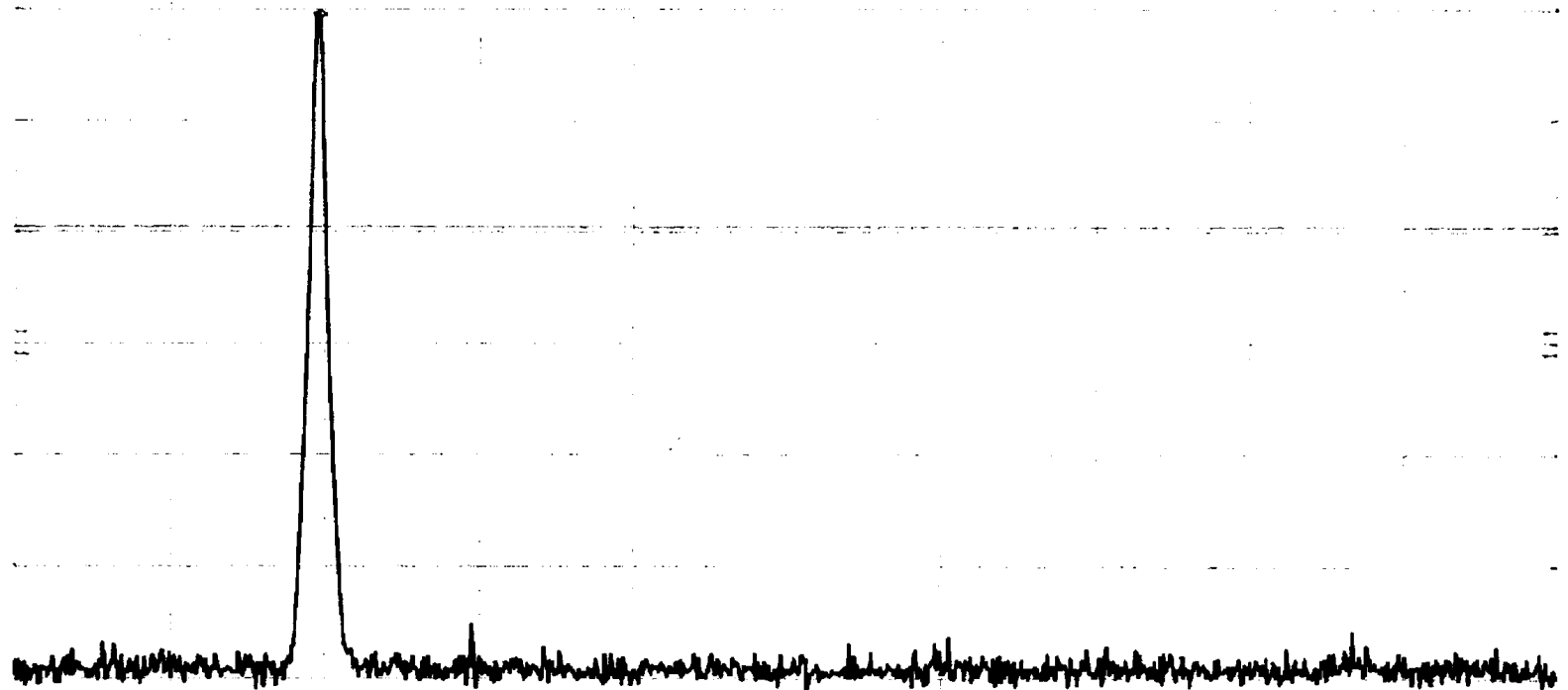
18.0

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

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

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

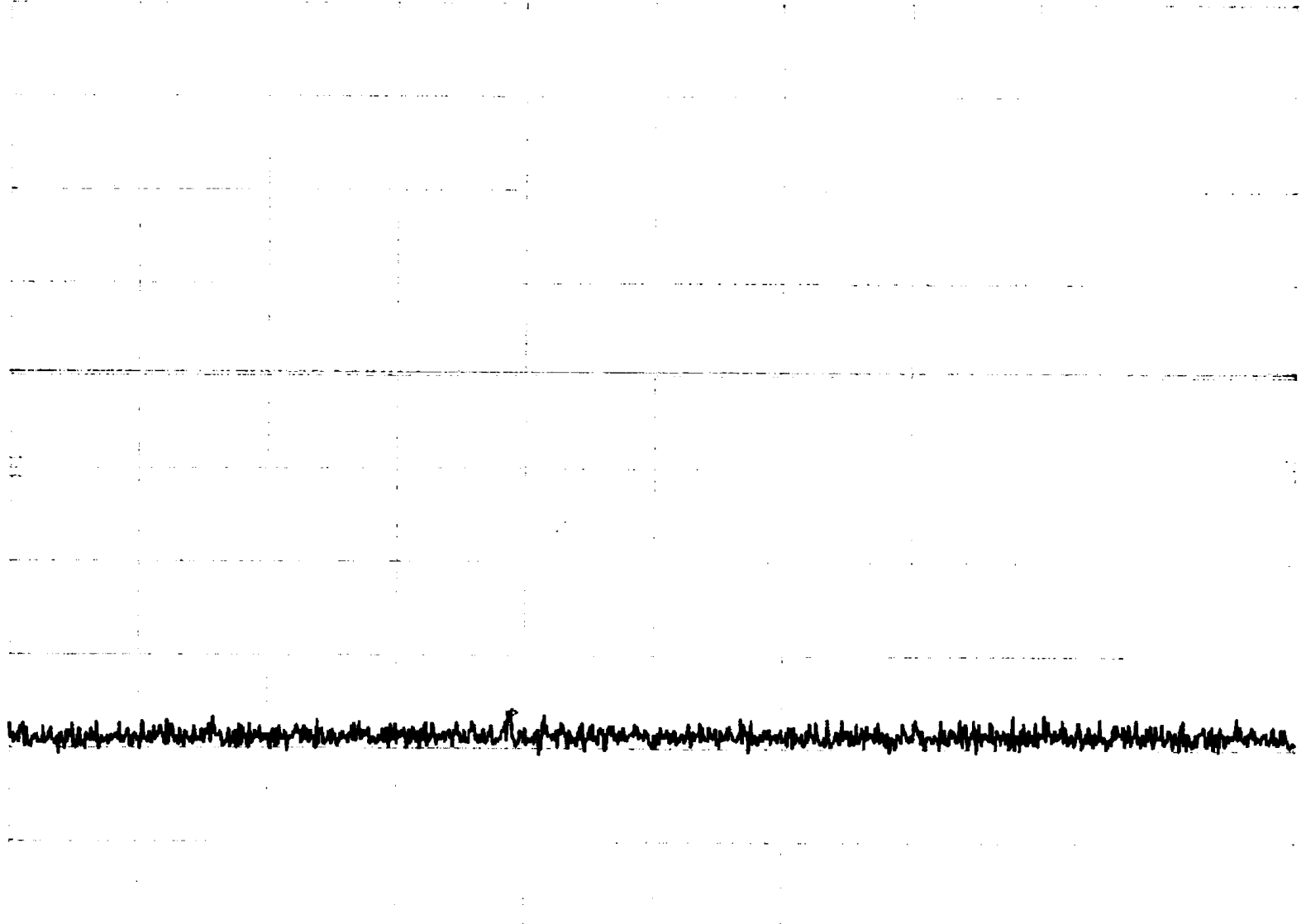
10 dB

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 2.590 GHz
-20.00 dBm

REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET

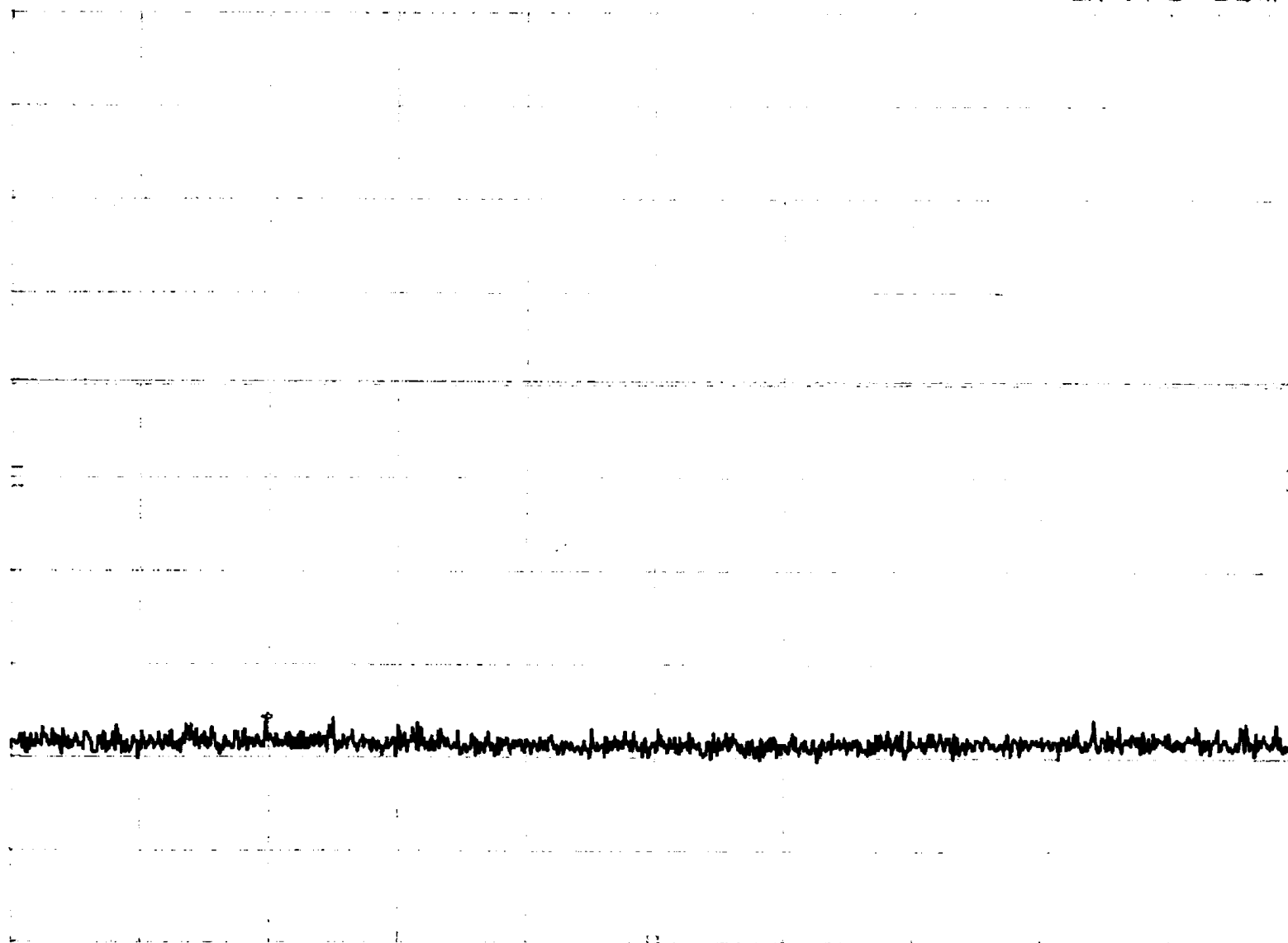
18.0

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 5.8.0 G
-22.25 dBm

REF 48.0 dBm ATTEN 40 dB

10 dB/

POS PK

OFFSET

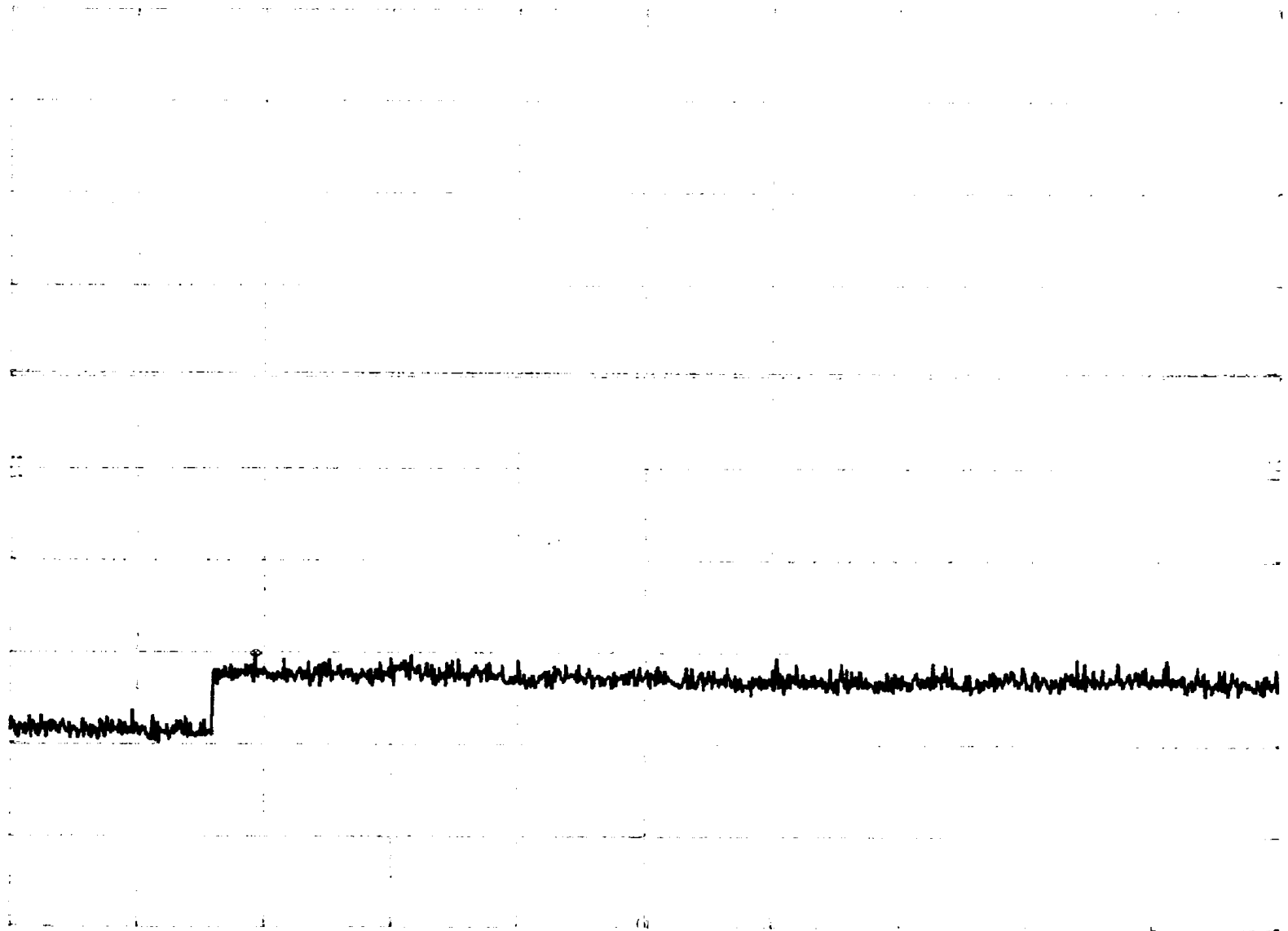
18.0

dB

JL

8.4

dBm



START 5.00 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 6.00 GHz

SWP 1.50 sec

39

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:

A handwritten signature in black ink, appearing to read "Jim Owen", with a stylized, cursive script.

Jim Owen
(EMC Engineer)