FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENT
CLASS II PERMISSIVE CHANGE

TEST REPORT

FOR

750W OUTPUT MICROWAVE OVEN

MODEL: HM06R750B

FCC ID: PKAXZHM06750W

BRAND NAME: HAIER

REPORT NUMBER: 01C0885-1

ISSUE DATE: July 27, 2001

Prepared for

QINGDAO HAIER MICROWAVE PRODUCTION CO., LTD.
HAIER INDUSTRY PARK, QINGDAO DEVELOPMENT DISTRICT
QINGDAO, SHANDONG 266510
PRC

Prepared by

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME : QINGDAO HAIER MICROWAVE PRODUCTION CO., LTD.

CONTACT PERSON : LI ZHANG / ENGINEER

TELEPHONE NO : 532-893-9680

EUT DESCRIPTION: 750W MICROWAVE OVEN

MODEL NO/NAME : HM06R750B

DATE TESTED : July 19, 2001

TYPE OF EQUIPMENT:	CONSUMER ISM EQUIPMENT
TECHNICAL LIMIT:	FCC PART 18 SUBPART C
FCC RULES:	PART 18
MEASUREMENT PROCEDURE	MP-5
EQUIPMENT AUTHORIZATION PROCEDURE	CLASS II PERMISSIVE CHANGE
MODIFICATIONS MADE ON EUT	☐ YES ☒ NO

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 18. This said equipment in this configuration described in this report shows that maximum emission levels.

WARNING: This report documents conditions under which testing was conducted and the results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document emanating from equipment are within the compliance requirements.

Tested and Reviewed By:

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WIRELESS EMC ENGINEER
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SENIOR EMC ENGINEER
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2. PRODUCT DESCRIPTION

The equipment under test was three 750Watt-microwave ovens sold for consumer use Models: HM06R750B Please refer to the following for Magnetron model differences. The oven has easy rotary control. There are five different desired settings. A new feature is the defrost settings. When the defrost setting is set the microwave heats the outer surface of the food and this heat slowly moves to the center. In additions the defrost setting can be used for slower gentler cooking. For the timer rotary control there is a total of 30 minutes max.

Model Differences:

Serial Number	Magnetron Differences	Magnetron Model Number	Tested (Checked)
010600504	**Panasonic**	**2M210**	☒
010600510	**LG**	**2M226**	☒
010600512	**Toshiba**	**2M253**	☒

Here is a list for the manufactures of the three magnetrons.

Magnetron Differences	Manufacturers
Panasonic	**Shanghai Matsushita Electronic Instruments Co., Ltd.**
LG	**LG International Corporations**
Toshiba	**Toshiba Electronic Asia, Ltd.**

3. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

4. ACCREDITATION AND LISTING

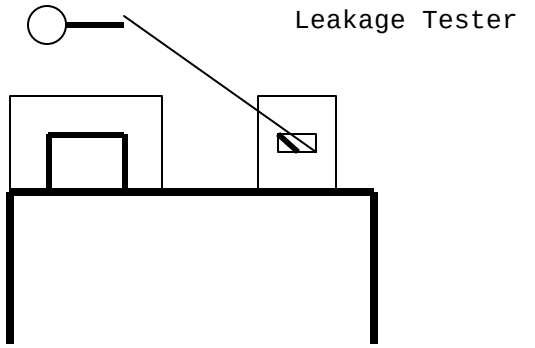
The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code:200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT(1300F2))

5. MEASUREMENT EQUIPMENT LIST

TEST EQUIPMENTS LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
Spectrum Analyzer	HP100Hz - 22GHz	8566B	2140A01296	5/4/02
Spectrum Display	HP	85662A	2152A03066	5/10/02
Quasi-Peak Detector	HP9K - 1GHz	85650A	2811A01335	5/4/02
Pre-Amplifier, 25 dB	HP 0.1 - 1300MHz	8447D (P_1M)	2944A06833	11/21/01
Antenna, BiLog	Chase EMC Ltd.30 - 2000MHz	CBL6112	2049	12/11/01
Horn Antenna(1 - 18GHz)	EMCO	3115	2238	6/20/02
Pre-Amplifier	MITEQ1-26GHz	NSP2600-44	646456	4/12/02
EMC Receiver (9K-26.5GHz)	HP	8593EM	3710A00205	6/20/02
AC Power Source	ACS	Afc-10k-afc2	J1568	N.C.R.
Microwave Leakage Tester	Simpson	380-2	N/A	N.C.R.

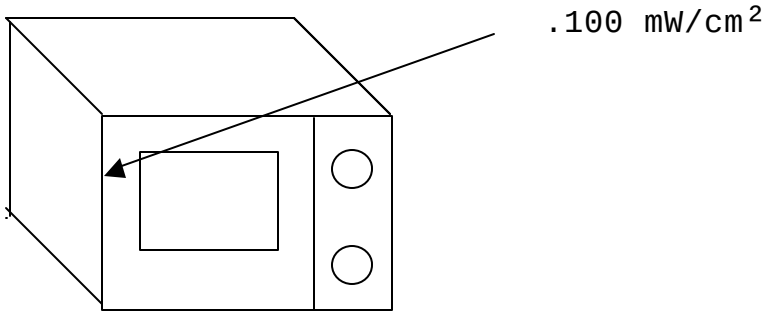
6. RADIO NOISE EMISSION MEASUREMENTS PROCEDURES/RESULTS

6.1 RADIATION HAZARD MEASUREMENT



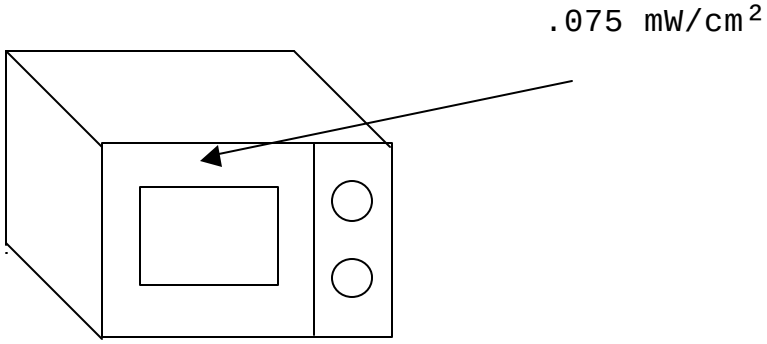
Radiation Hazard Measurements

A 1000-ml water load was placed in the center of the oven. The power setting was set to 10(100%) maximum power. While the oven was operating, the Microwave leakage probe was moved slowly around the door seams to check for leakage.



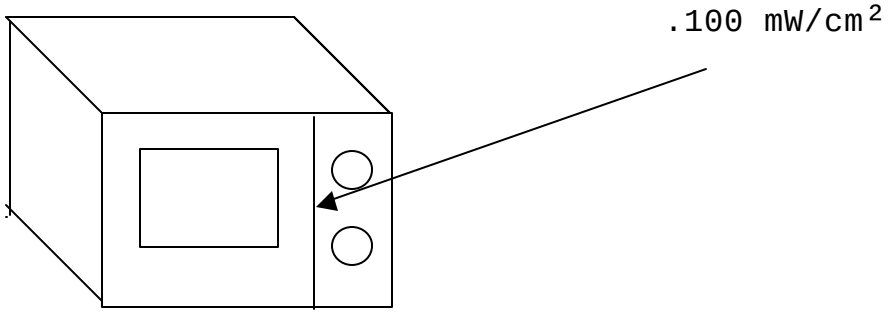
S/N:010600504

LOCATION	MAXIMUM LEAKAGE (mW/cm²)	LIMIT (mW/cm²)
Fig.1 shows the locations of maximum leakage	.100	1.0
All others	.05	1.0



S/N:010600510

LOCATION	MAXIMUM LEAKAGE **(mW/cm²)**	LIMIT **(mW/cm²)**
Fig.1 shows the locations of maximum leakage	.075	1.0
All others	.05	1.0



S/N:010600512

LOCATION	MAXIMUM LEAKAGE **(mW/cm²)**	LIMIT **(mW/cm²)**
Fig.1 shows the locations of maximum leakage	.100	1.0
All others	.075	1.0

6.2 INPUT POWER

Input power and current were measured using a voltmeter and a ampmeter. A 700 ml water load was placed in the center of the oven and the oven was set to 10(100%) maximum power. A 700-ml water load was chosen for its compatibility. Manufacturers to determine their input ratings commonly use this procedure.

Serial Number	Input Voltage (Vac)	Input Current (Amps)	Measured Input Power(Watts)
010600504	115	8.9	1023.5
010600510	114.9	7.4	850.26
010600512	114.9	8.6	988.14

Based on the measured input power, the EUT was found to be operating within the intended specifications.

6.3 RF OUTPUT POWER MEASUREMENT

The Caloric Method was used to determine maximum output power. The initial temperature of a 1000-ml water load was measured.

The water load was placed in the center of the oven. The oven was operated at maximum output power for 120 seconds. Then the temperature of the water was re-measured, after a quick stir.

S/N:010600504

Starting Temperature (°C)	**Final Temperature (°C)**	**Elapaed Time (Seconds)**	**RF Power (Watts)**
21.67	**31.1**	**120**	**330.05**
21.67	**33.89**	**120**	**427.7**
21.67	**36.1**	**120**	**505.05**
Average of three trials:			**420.03**

S/N:010600510

Starting Temperature (°C)	Final Temperature (°C)	Elapaed Time (Seconds)	RF Power (Watts)
21.11	37.22	120	563.85
21.11	37.78	120	583.45
21.11	36.67	120	544.6
Average of three trials:			563.97

S/N:010600512

Starting Temperature (°C)	Final Temperature (°C)	Elapaed Time (Seconds)	RF Power (Watts)
20	37.67	120	583.45
20	37.22	120	602.7
20.56	38.33	120	621.95
Average of three trials:			602.7

$$\text{Power} = \frac{(4.2 \text{ Joules/Cal}) \times (\text{Volume in ml}) \times (\text{Temp. Rise})}{\text{Time in seconds}}$$

The measured output for S/N:010600504 was found to be less than 500 Watts. Therefore, in accordance with section 18.305 of Subpart B, the measured out-of-band emissions were compared to the 25 µV/m @ 300m limit.

For S/N:010600510 and S/N:010600512 the measured output was found to be greater then 500 watts. Therefore in accordance to section 18.305 of subpart B we used the following formula to determined the out of band emission.

$$\text{Limit(uV/m) @ 300meters} = 25 * \sqrt{(\text{power}/500)}$$

Serial Number	Limit (uV/m)	Limit(dBuV/M
010600504	25	28
010600510	27.5	28.8
010600512	26.5	28.5

6.4 OPERATING FREQUENCY MEASUREMENTS

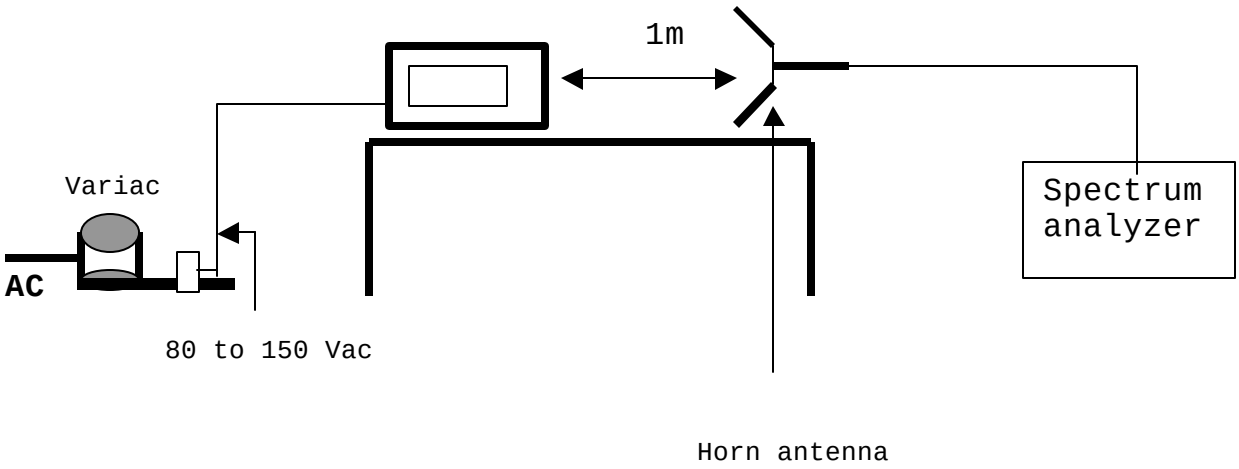


Figure 1. Operating Frequency Measurement Set-up

6.5 VARIATION IN OPERATING FREQUENCY WITH TIME

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000-ml water load was placed in the center of the oven and the oven was operated at maximum output power.

The fundamental operating frequency was monitor until the water load was reduced to 20% of the original load.

The results of this test are as follows.

Initial load: 1000 ml
Load at completion of test: 200 ml

S/N:010600504

Maximum Frequency Observed	**2470.8 MHz**
Maximum Frequency Allowed	2500 MHz
Minimum Frequency Observed	**2431 MHz**
Minimum Frequency Allowed	2400 MHz

S/N:010600510

Maximum Frequency Observed	**2470 MHz**
Maximum Frequency Allowed	2500 MHz
Minimum Frequency Observed	**2430.8 MHz**
Minimum Frequency Allowed	2400 MHz

S/N:010600512

Maximum Frequency Observed	**2469.5 MHz**
Maximum Frequency Allowed	2500 MHz
Minimum Frequency Observed	**2431 MHz**
Minimum Frequency Allowed	2400 MHz

Refer to spectrum analyzer plot under ATTACHMENTS: **VARIATION IN OPERATING FREQUENCY WITH TIME PLOT** for details of frequency variation with operating time.

6.6 VARIATION IN OPERATING FREQUENCY WITH VOLTAGE

Following the above test, after operating the oven long enough to assure that stable operating temperature were obtained, the operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating.

The water load was maintained at 1000 ml to 200 ml for the duration of the test. At 96 Vac 100 ml of water was dispose of every 120 second until 200 ml was reached.

The results of this test are as follows:

Line voltage varied from 96Vac to 150Vac.

S/N:010600504

	96V (MHz)	115V (MHz)	150V (MHz)
MAX (2500MHz)	2468.5	1470.8	2466.5
MIN (2400MHz)	1428	2431	2425.8

S/N:010600510

	96V (MHz)	115V (MHz)	150V (MHz)
MAX (2500MHz)	2456.8	2470	2467.3
MIN (2400MHz)	2413.5	2430.8	2412.8

S/N:010600512

	96V (MHz)	115V (MHz)	150V (MHz)
MAX (2500MHz)	2440	2471.5	2471.5
MIN (2400MHz)	2410.8	2413	2413

Refer to spectrum analyzer plots under ATTACHMENTS: **VARIATION IN OPERATING FREQUENCY WITH VOLTAGE PLOTS** for details of Frequency variation with operating voltage.

6.7 RADIATED EMISSIONS

Radiated emissions were measured over an inclusive frequency range to 30MHz through the tenth harmonic of the operating frequency. For this test, a 1-meter high wooden table in an open laboratory area supported the device under test. The table was placed on a turntable.

The measurement antenna was placed 3 meters for measurements from 30 - 1000MHz and 1 meter for measurements from 1000 - 25,000MHz, respectively, for the device under test. The indicated frequency range was swept as the device under test was rotated along its vertical axis in 90° increments.

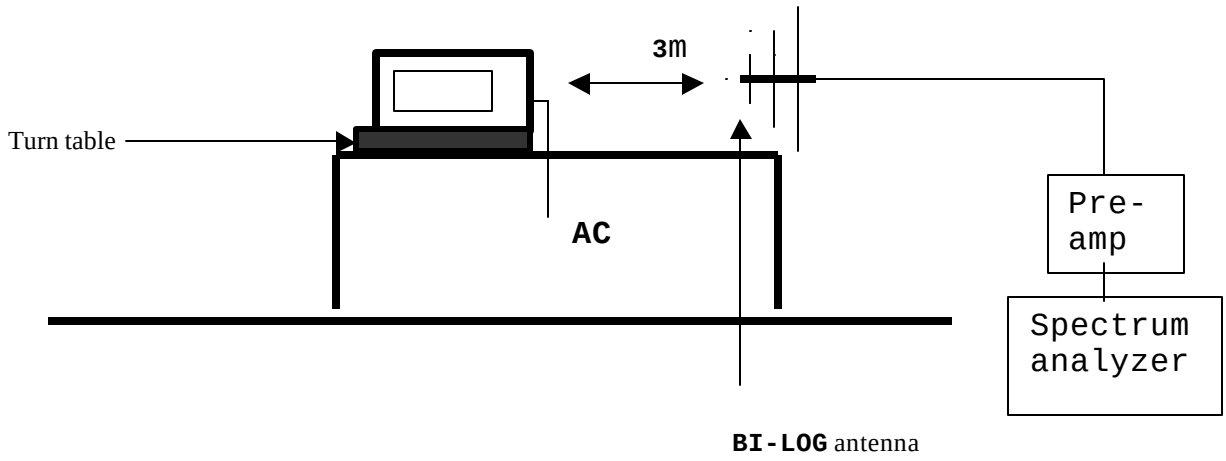
During the preliminary tests, the load consisted of 700-ml tap water placed in the center of the oven. The emissions were observed while the device under test was operated at maximum output power.

The level of the emissions near the edge of the designated ISM frequency band was measured. For this test, the load consisted of 700-ml water load located in the center of the oven.

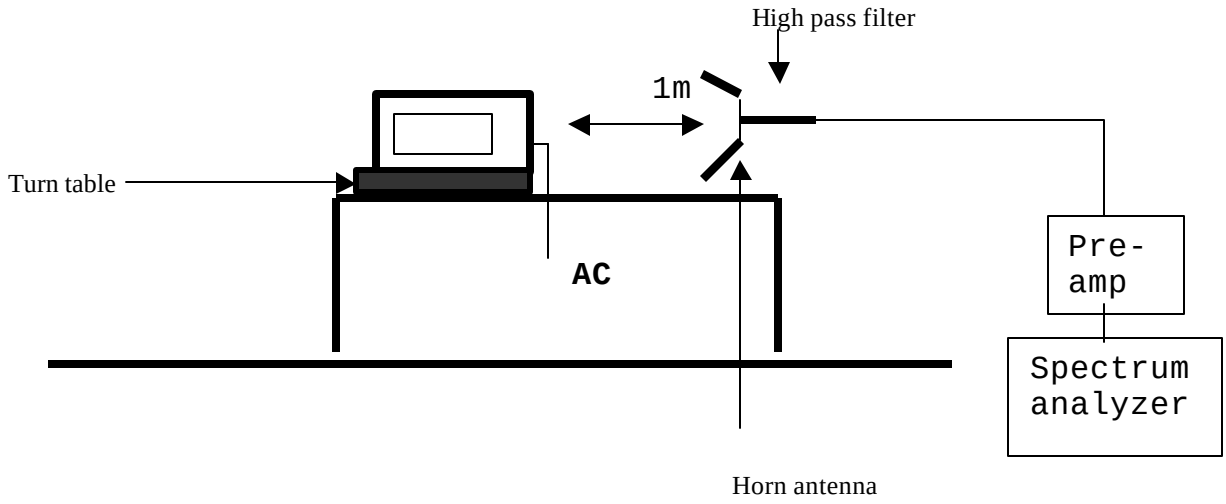
The levels of the second and third harmonic were measured inclusively with a 300 ml and 700 ml water load alternately placed in the center and right front corner of the oven. Harmonics beyond the third were measured with a 700-ml load placed in the center of the oven. The data obtained during these tests is contained on the attached spreadsheet.

The maximum of all other out-of-band emissions were measured while a 700-ml load was placed in the center of the oven. Maximum readings were recorded after variations in antenna polarizations, height, device orientation, load position, and size. For frequencies above 1 GHz, the video bandwidth of the spectrum analyzer was set to simulate a linear average detection mode (10Hz).

For all emissions the equivalent 300 meters intensity was calculated assuming a linear decrease in the intensity of the RFI field with increased distance. In the operating modes and conditions described, there were no over-limit emissions discovered.



Radiated Emissions Configuration



FCC 18 Emissions Configuration

There were no emissions detected from the EUT in the 30 - 1000 MHz region. Below is the data of the radiated scan.

Radiated Emission S/N:010600504

Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
800.00	37.00	20.40	7.77	28.86	36.31	46.00	-9.69	3mV	0.00	1.00	P
950.00	34.00	21.80	8.55	28.28	36.07	46.00	-9.93	3mH	0.00	1.00	P
500.00	36.20	17.80	5.78	29.35	30.43	46.00	-15.57	3mH	0.00	1.00	P
400.00	36.60	16.20	4.99	28.97	28.82	46.00	-17.18	3mV	0.00	1.00	P
45.00	38.60	12.00	1.51	29.47	22.64	40.00	-17.36	3mV	0.00	1.00	P
62.00	41.00	7.20	1.77	29.48	20.49	40.00	-19.51	3mH	0.00	1.00	P

Radiated Emission S/N:010600510

Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
858.00	25.00	20.99	4.43	28.73	20.59	46.00	-25.41	3mH	0.00	1.50	P
599.00	23.80	19.70	3.52	28.78	18.04	46.00	-27.96	3mH	0.00	1.50	P
500.00	23.20	16.78	2.83	27.96	15.15	46.00	-30.85	3mV	0.00	1.50	P
37.00	22.00	13.54	0.90	27.84	8.60	40.00	-31.40	3mV	0.00	1.50	P
925.00	22.90	22.57	4.99	28.32	22.33	54.00	-31.67	3mH	0.00	1.50	P
150.00	21.00	14.50	2.10	27.24	12.36	46.00	-33.64	3mV	0.00	1.50	P

Radiated Emission S/N:010600512

Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
799.00	23.90	20.99	4.43	28.73	20.59	46.00	-25.41	3mH	0.00	1.50	P
600.00	23.60	19.70	3.52	28.78	18.04	46.00	-27.96	3mH	0.00	1.50	P
399.00	23.50	16.78	2.83	27.96	15.15	46.00	-30.85	3mV	0.00	1.50	P
47.00	22.00	13.54	0.90	27.84	8.60	40.00	-31.40	3mV	0.00	1.50	P
995.00	23.10	22.57	4.99	28.32	22.33	54.00	-31.67	3mH	0.00	1.50	P
250.00	23.00	14.50	2.10	27.24	12.36	46.00	-33.64	3mV	0.00	1.50	P

FCC 18 Radiated Emission S/N:010600504

Freq.	Reading	AF	Closs	Pre-amp	Dist	Other	Level	Limit	Margin	Pol
(MHz)	(dBuV)	(dB)	(dB)	(dB)	dB	dB	(dBuV/m)	FCC_18	(dB)	(H/V)
14700	42.00	40.18	11.66	31.25	49.50	1.00	12.09	28.0	-15.91	H
17150	36.00	43.26	13.26	31.25	49.50	1.00	10.77	28.0	-17.23	H
14700	37.90	40.18	11.66	31.25	49.50	1.00	7.99	28.0	-20.01	V
12250	41.20	39.18	9.07	31.25	49.50	1.00	7.70	28.0	-20.30	V
17150	32.80	43.26	13.26	31.25	49.50	1.00	7.57	28.0	-20.43	V
9800	42.00	37.65	9.05	31.25	49.50	1.00	6.95	28.0	-21.05	H

FCC 18 Radiated Emission S/N:010600510

Freq.	Reading	AF	Closs	Pre-amp	Dist	Other	Level	Limit	Margin	Pol
(MHz)	(dBuV)	(dB)	(dB)	(dB)	dB	dB	(dBuV/m)	FCC_18	(dB)	(H/V)
17150	40.40	43.26	13.26	31.25	49.50	1.00	15.17	28.8	-13.63	V
17150	40.00	43.26	13.26	31.25	49.50	1.00	14.77	28.8	-14.03	H
22050	43.00	32.50	15.76	31.25	49.50	1.00	9.51	28.8	-19.29	H
22050	43.00	32.50	15.76	31.25	49.50	1.00	9.51	28.8	-19.29	V
14700	39.00	40.18	11.66	31.25	49.50	1.00	9.09	28.8	-19.71	H
14700	39.00	40.18	11.66	31.25	49.50	1.00	9.09	28.8	-19.71	V

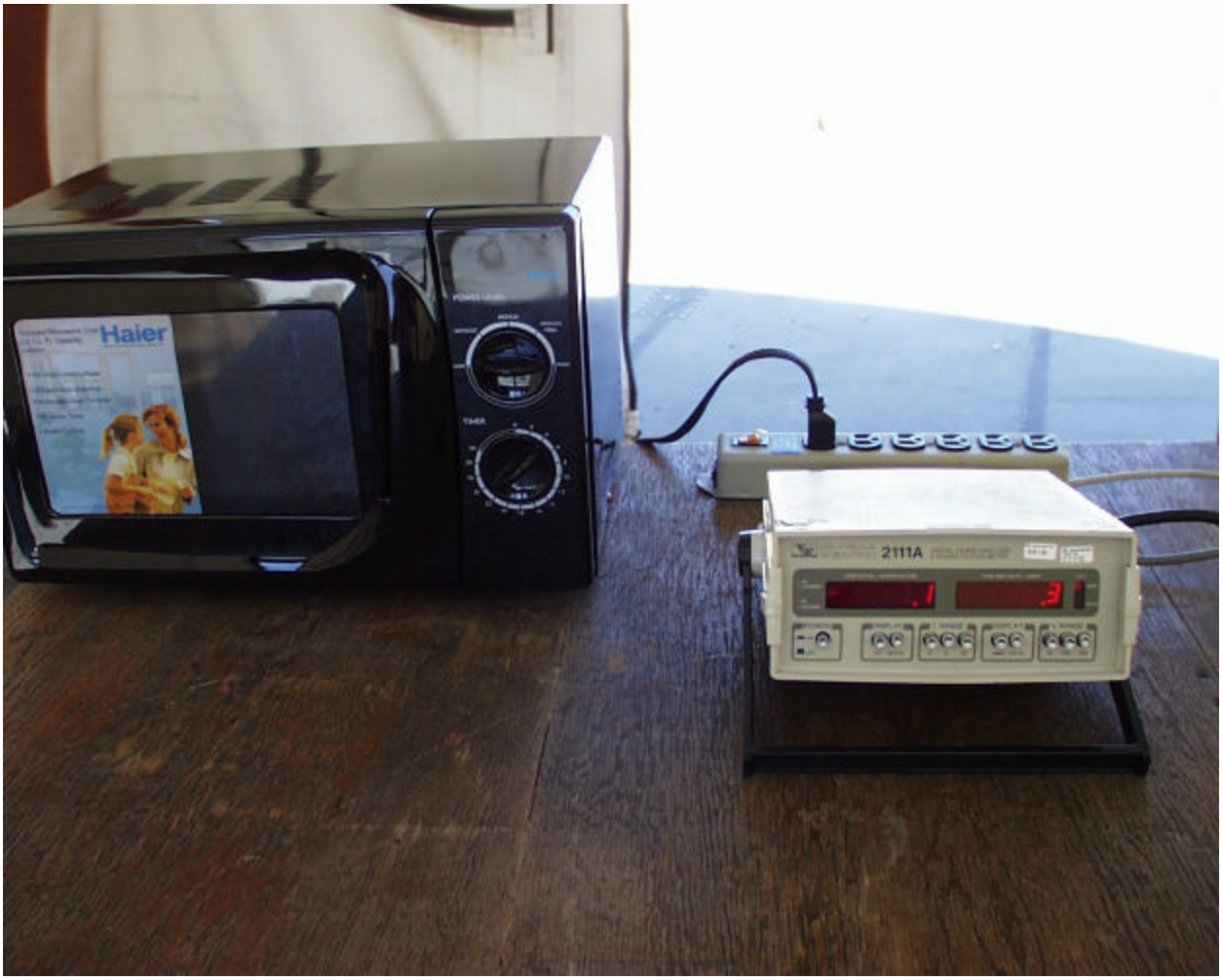
FCC 18 Radiated Emission S/N:010600512

Freq.	Reading	AF	Closs	Pre-amp	Dist	Other	Level	Limit	Margin	Pol
(MHz)	(dBuV)	(dB)	(dB)	(dB)	dB	dB	(dBuV/m)	FCC_18	(dB)	(H/V)
17150	40.00	43.26	13.26	31.25	49.50	1.00	14.77	28.5	-13.73	V
17150	39.00	43.26	13.26	31.25	49.50	1.00	13.77	28.5	-14.73	H
14700	41.00	40.18	11.66	31.25	49.50	1.00	11.09	28.5	-17.41	H
22050	43.00	32.50	15.76	31.25	49.50	1.00	9.51	28.5	-18.99	H
14700	39.00	40.18	11.66	31.25	49.50	1.00	9.09	28.5	-19.41	V
22050	42.00	32.50	15.76	31.25	49.50	1.00	8.51	28.5	-19.99	V

7. EUT SETUP PHOTOS

FREQUENCY VS. TIME (Voltage) SETUP

RADIATED HAZARD TEST



INPUT POWER TEST

RF POWER OUTPUT

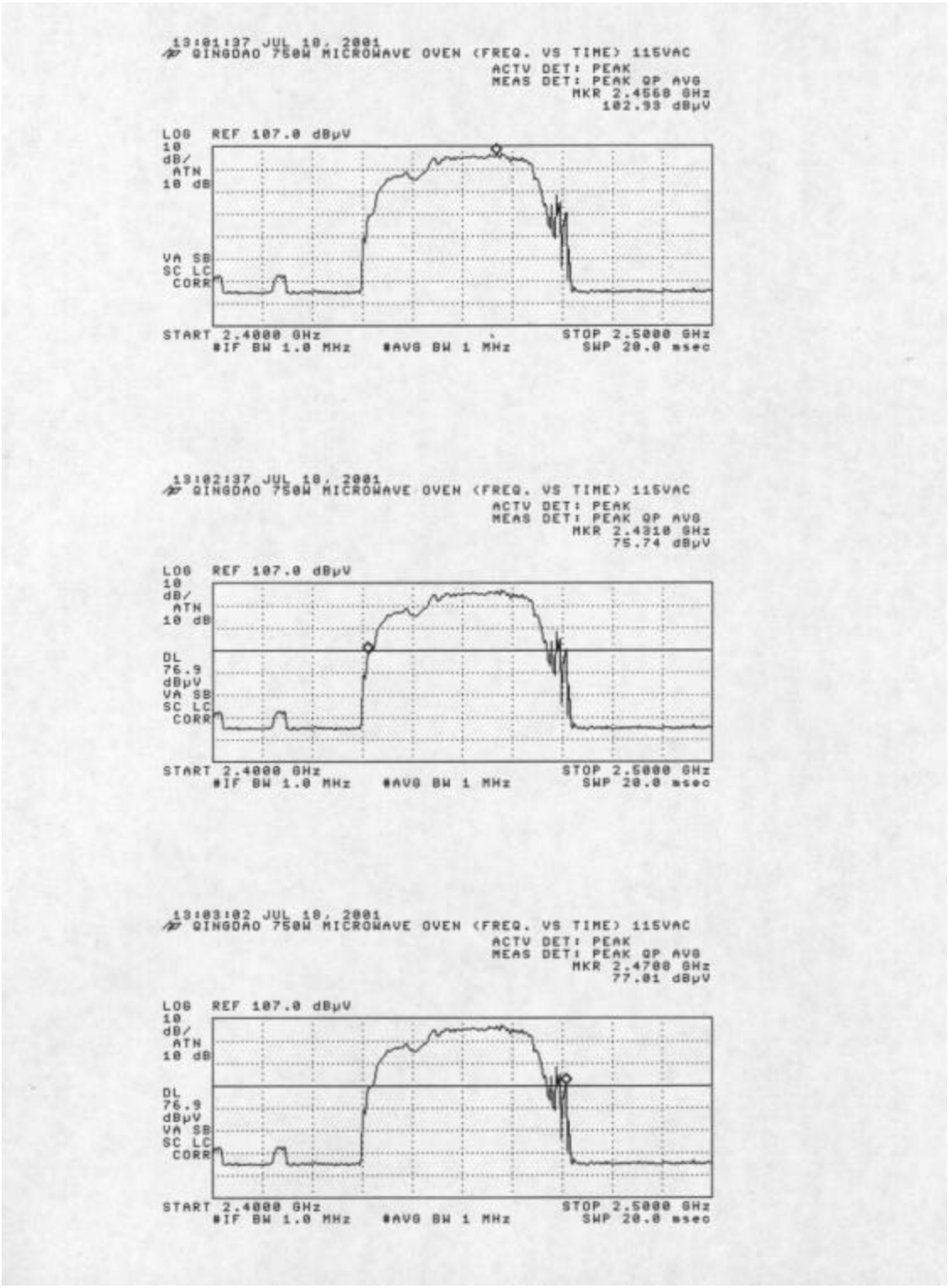
RADIATED TEST SETUP BELOW 1GHz (BACK SIDE)

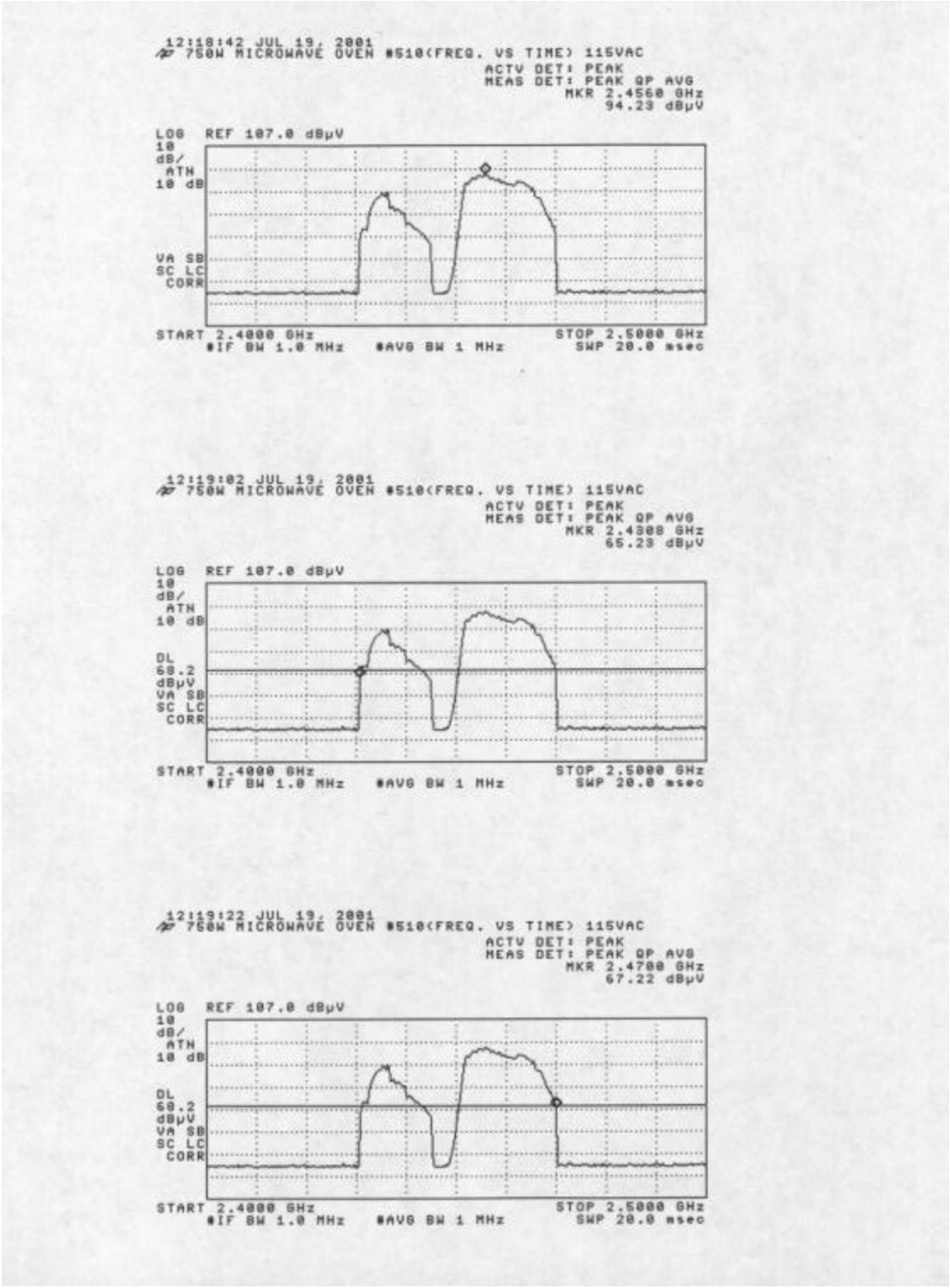
RADIATED TEST SETUP BELOW 1GHz (FRONT SIDE)

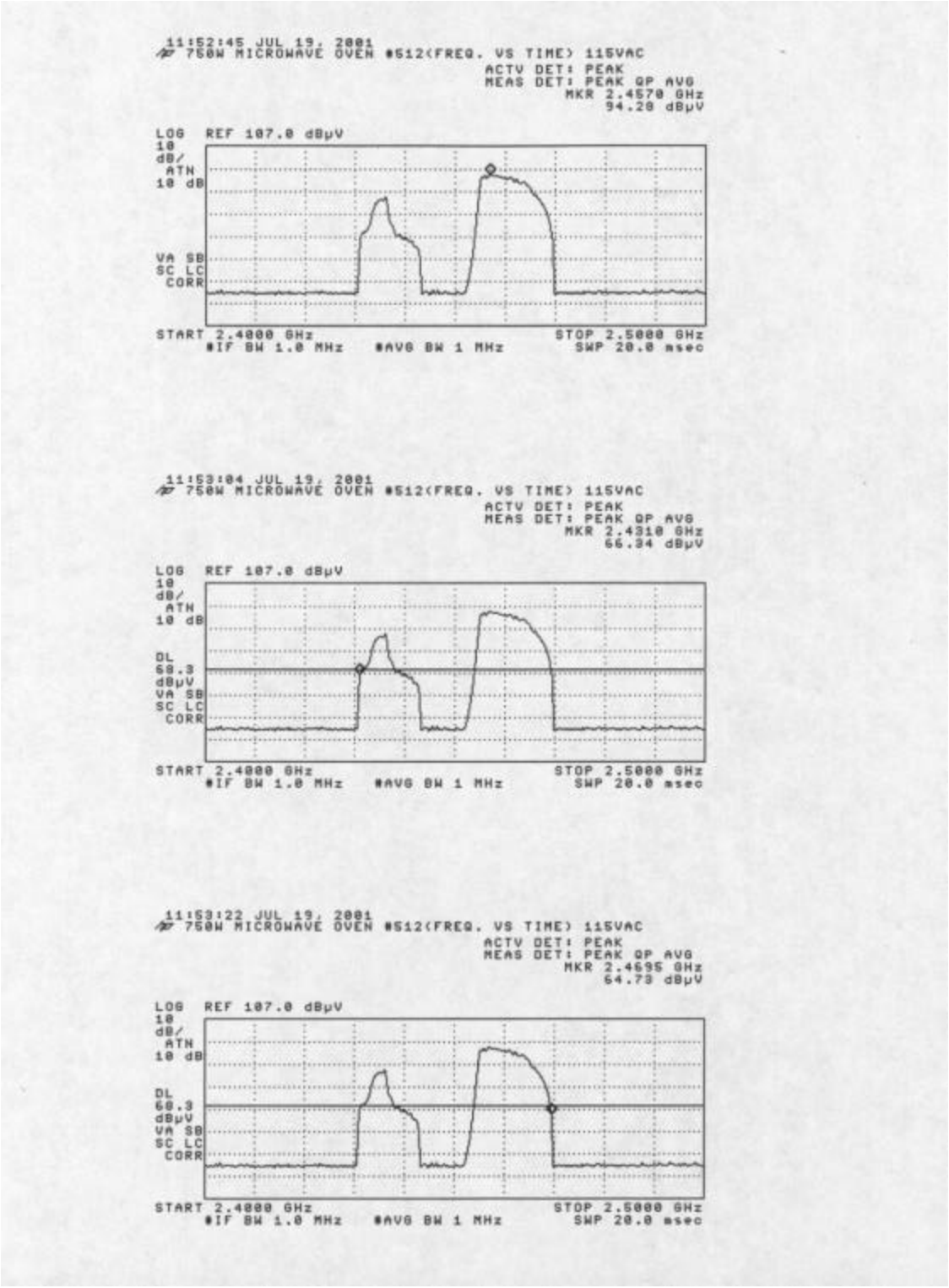
FCC 18 SCAN above 1GHz

ATTACHMENTS

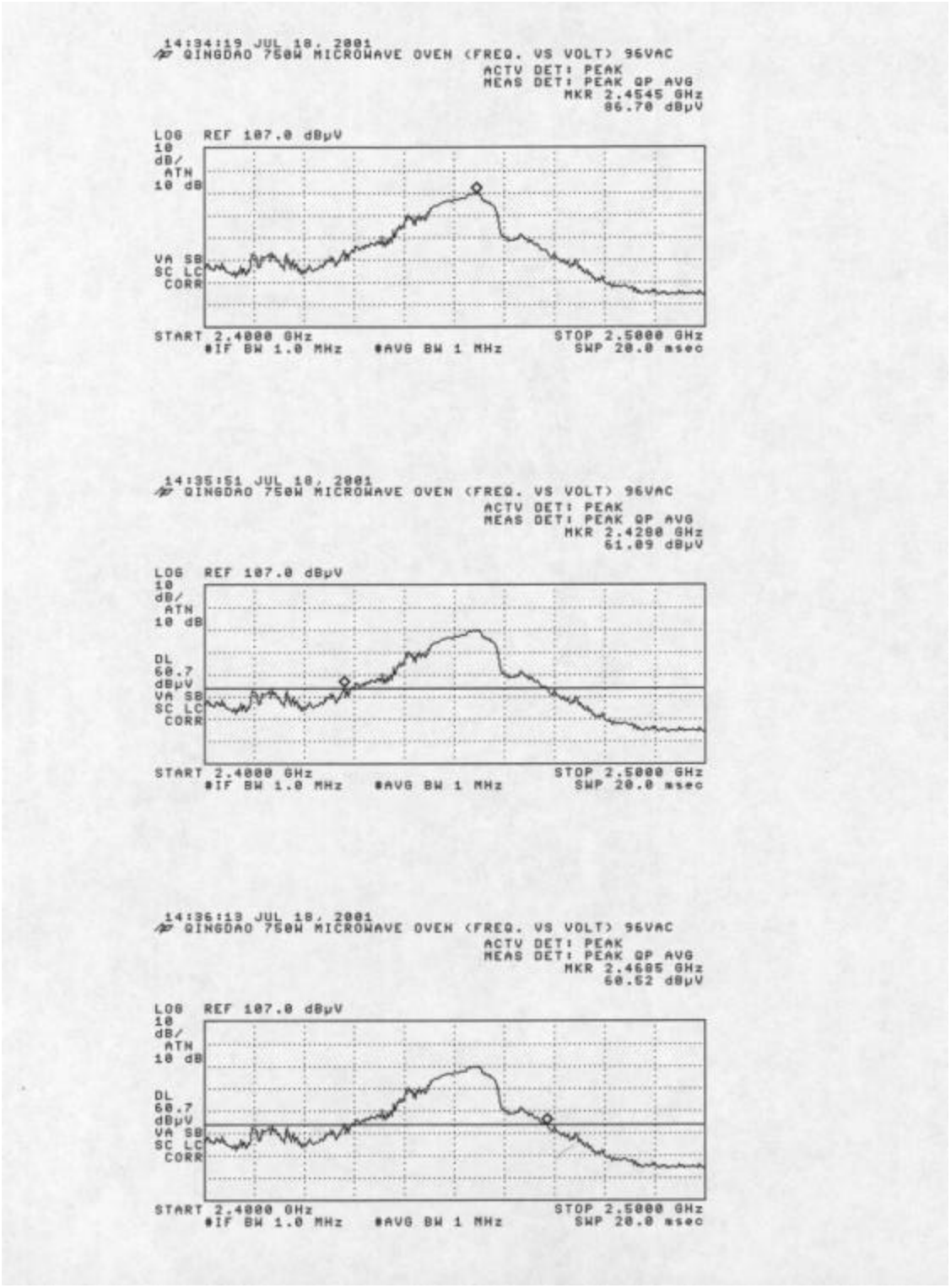
VARIATION IN OPERATING FREQUENCY VS. TIME PLOTS

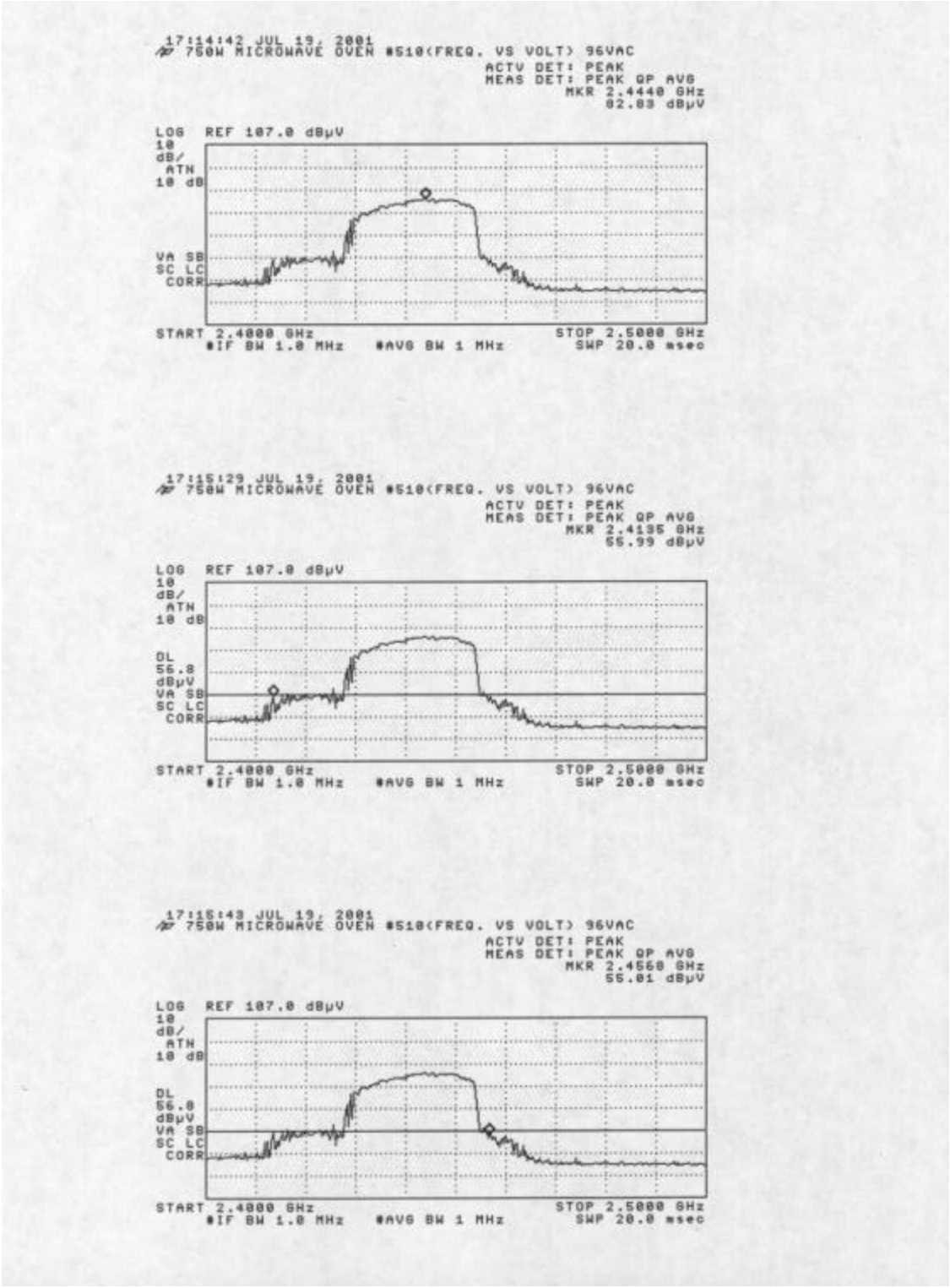


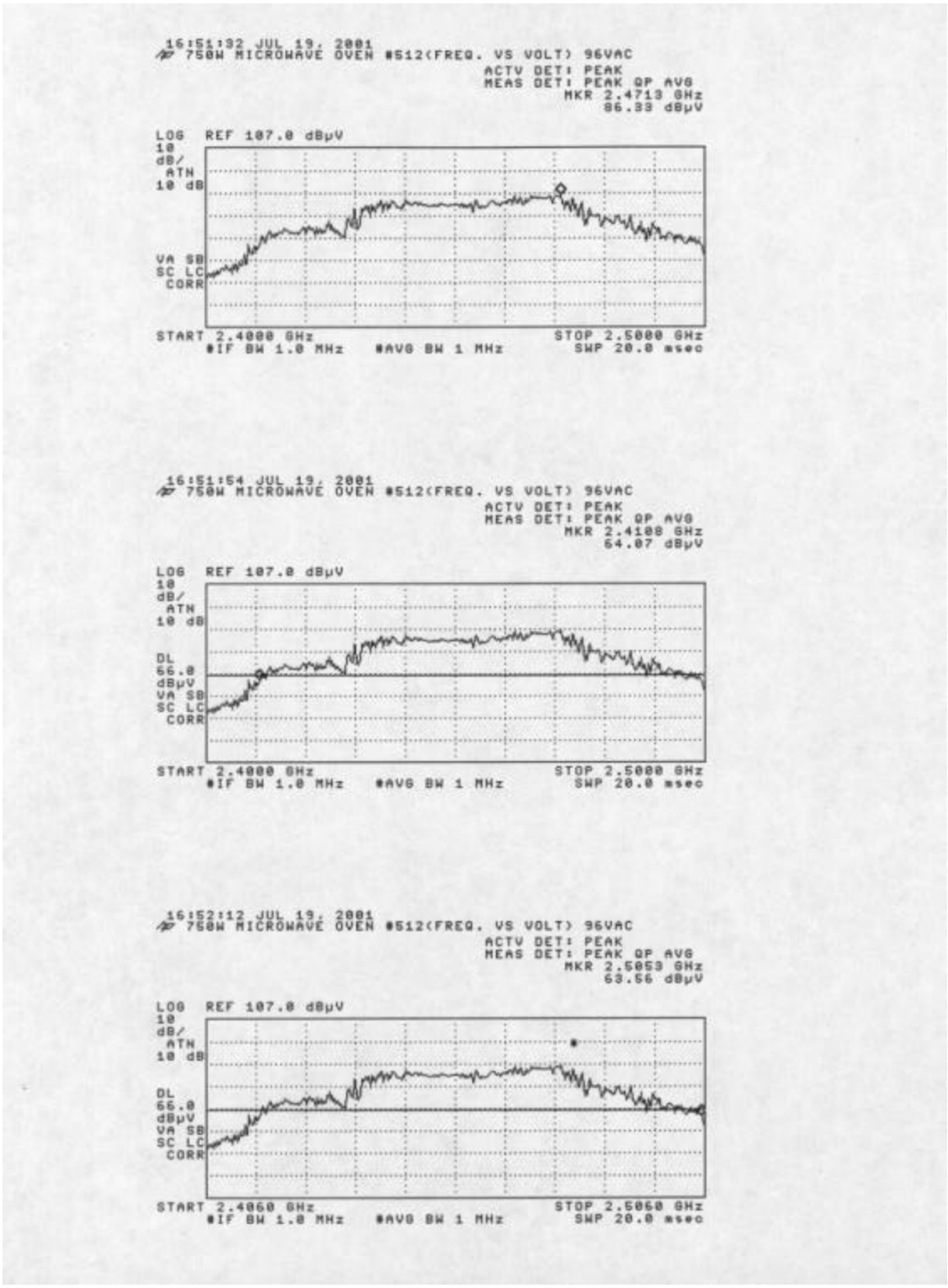




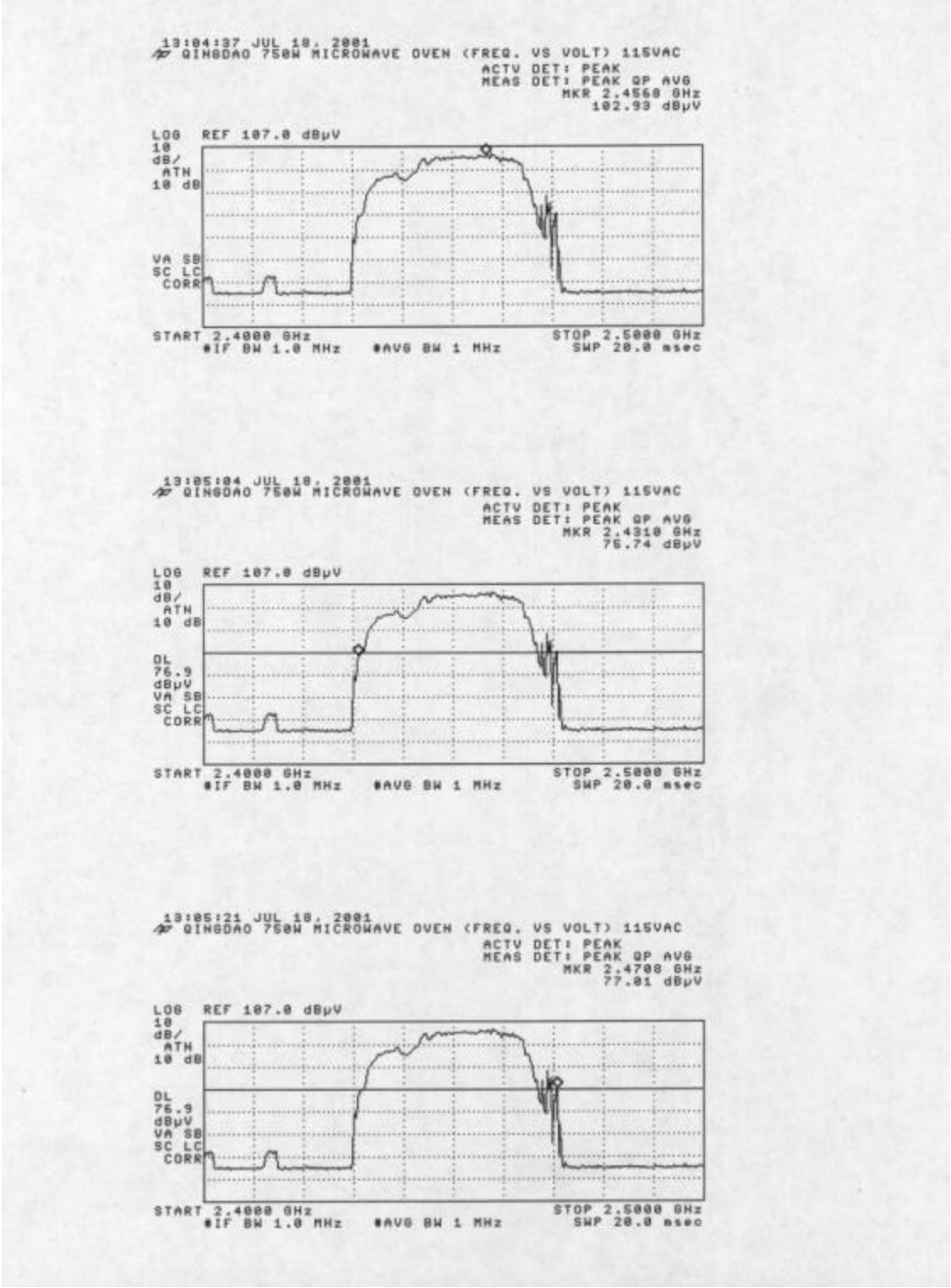
VARIATION IN OPERATING FREQUENCY VS. VOLTAGE PLOTS (96Vac)

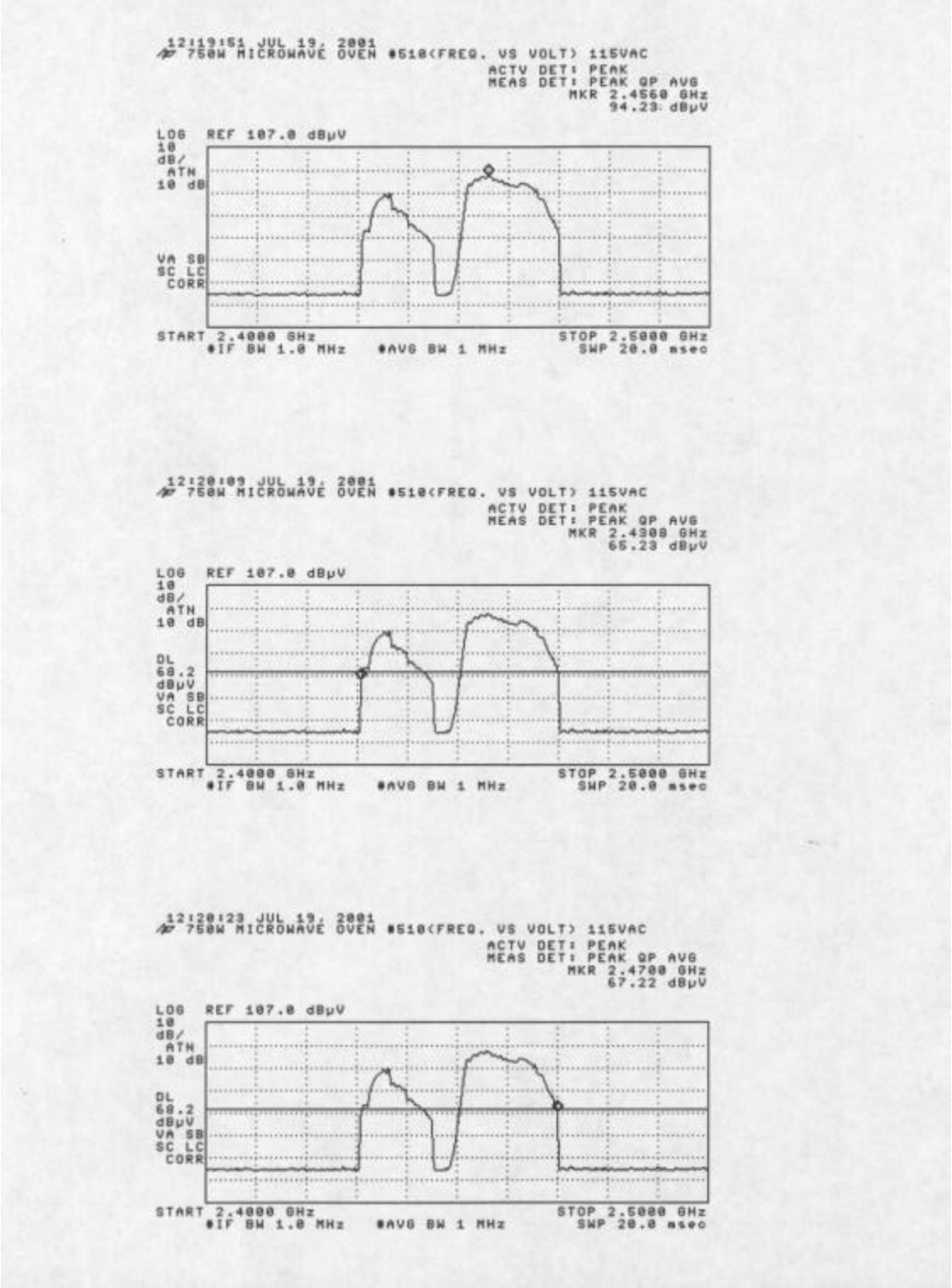


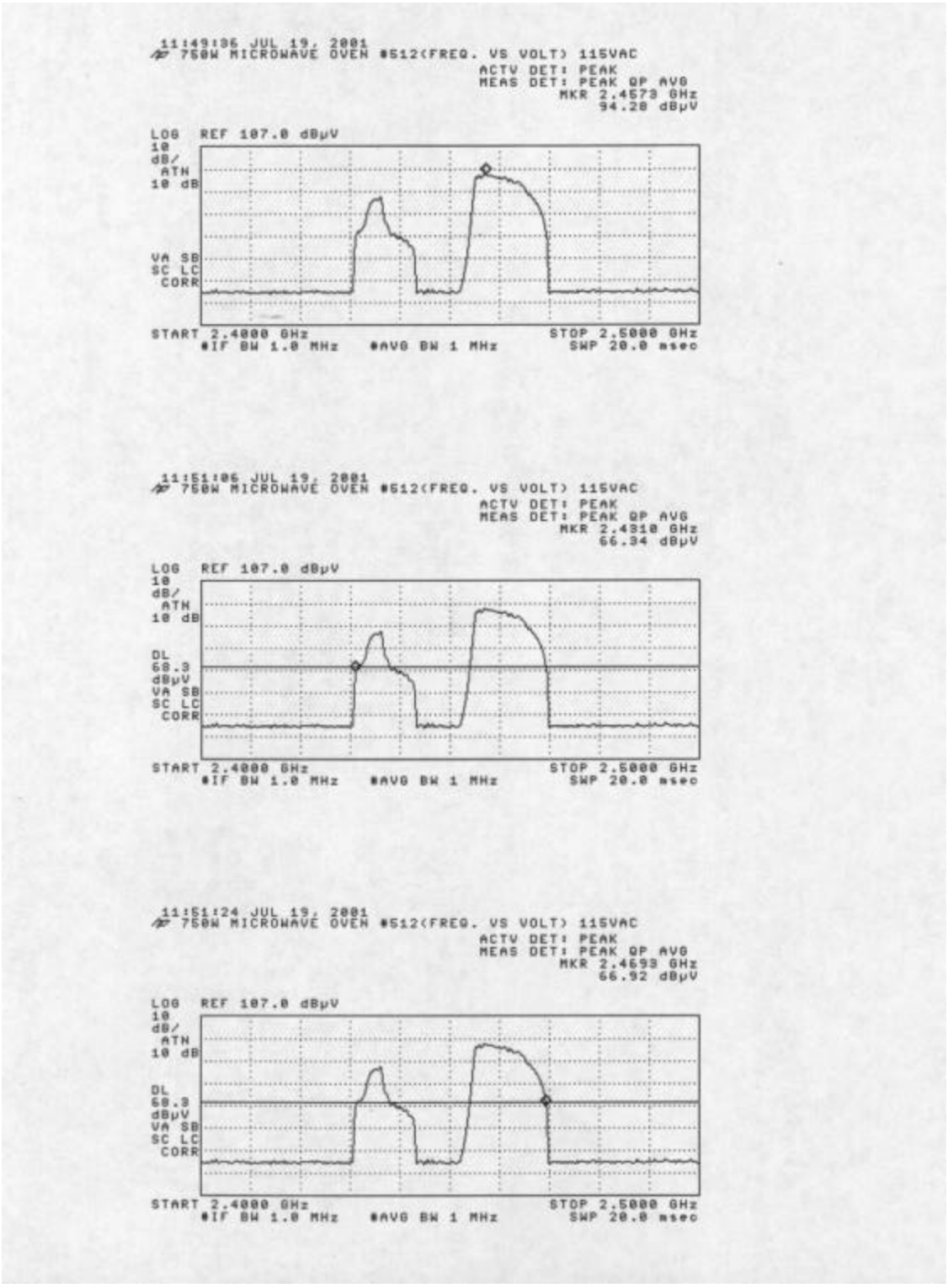




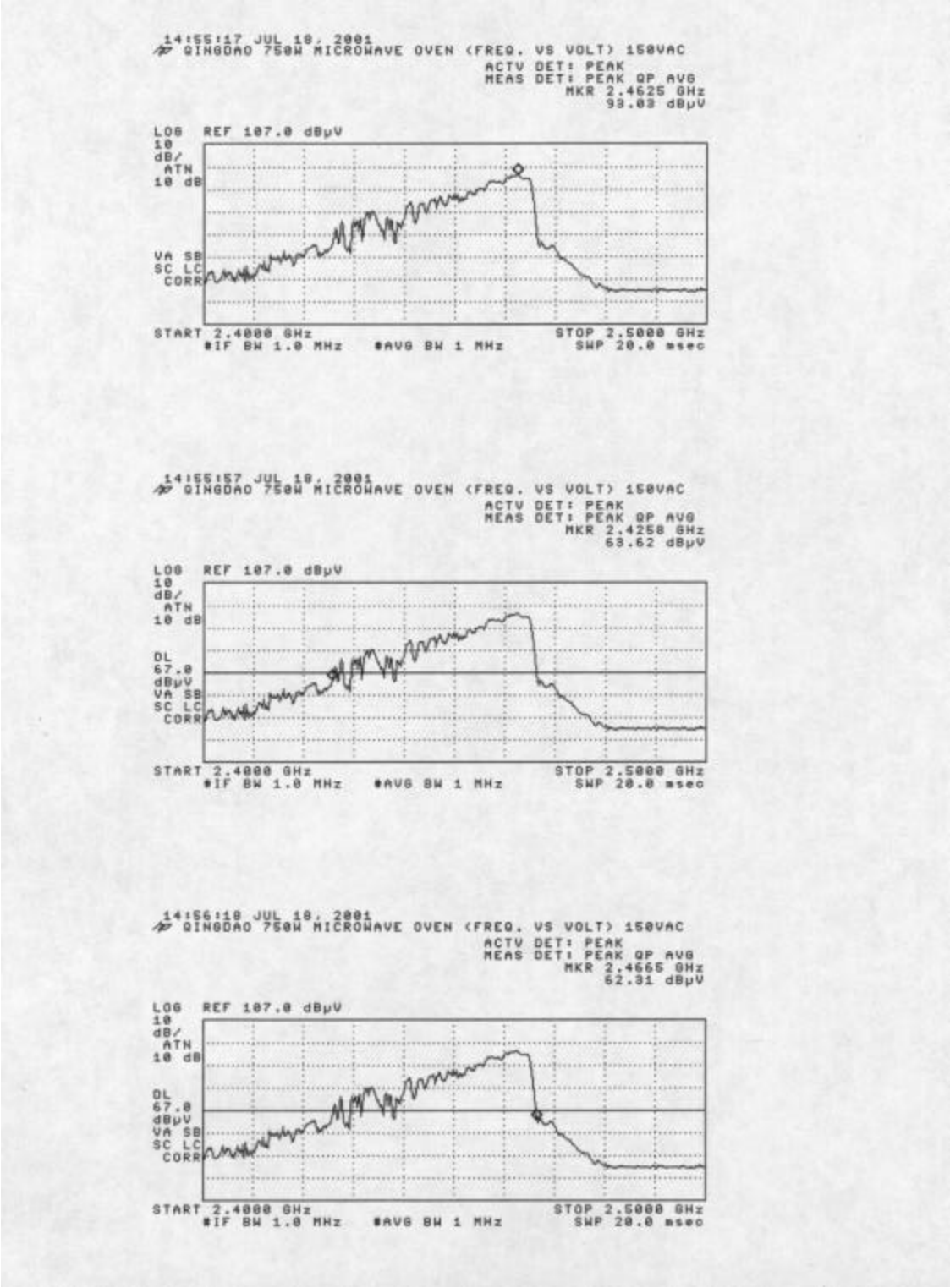
VARIATION IN OPERATING FREQUENCY VS. VOLTAGE PLOTS (115Vac)

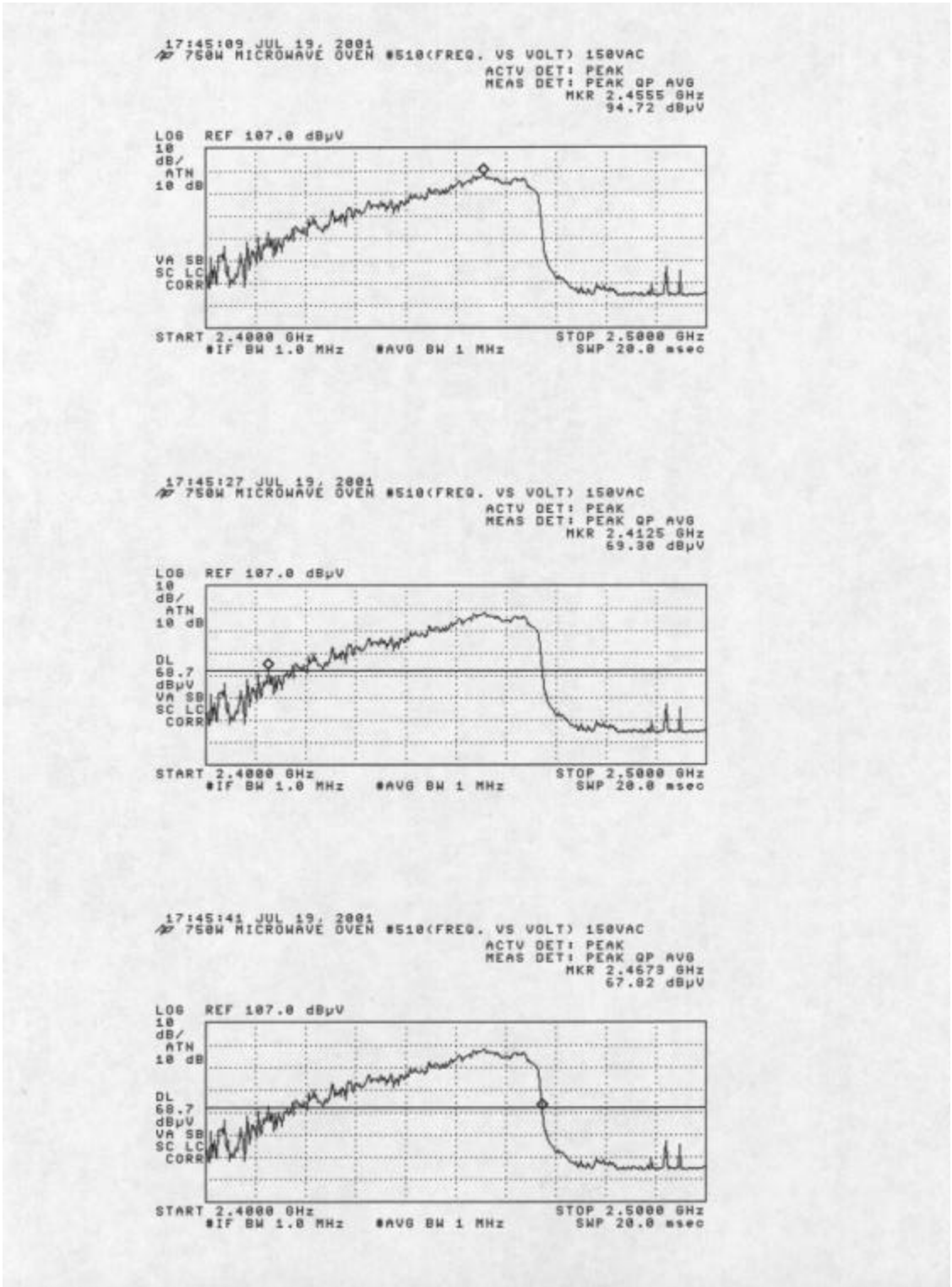


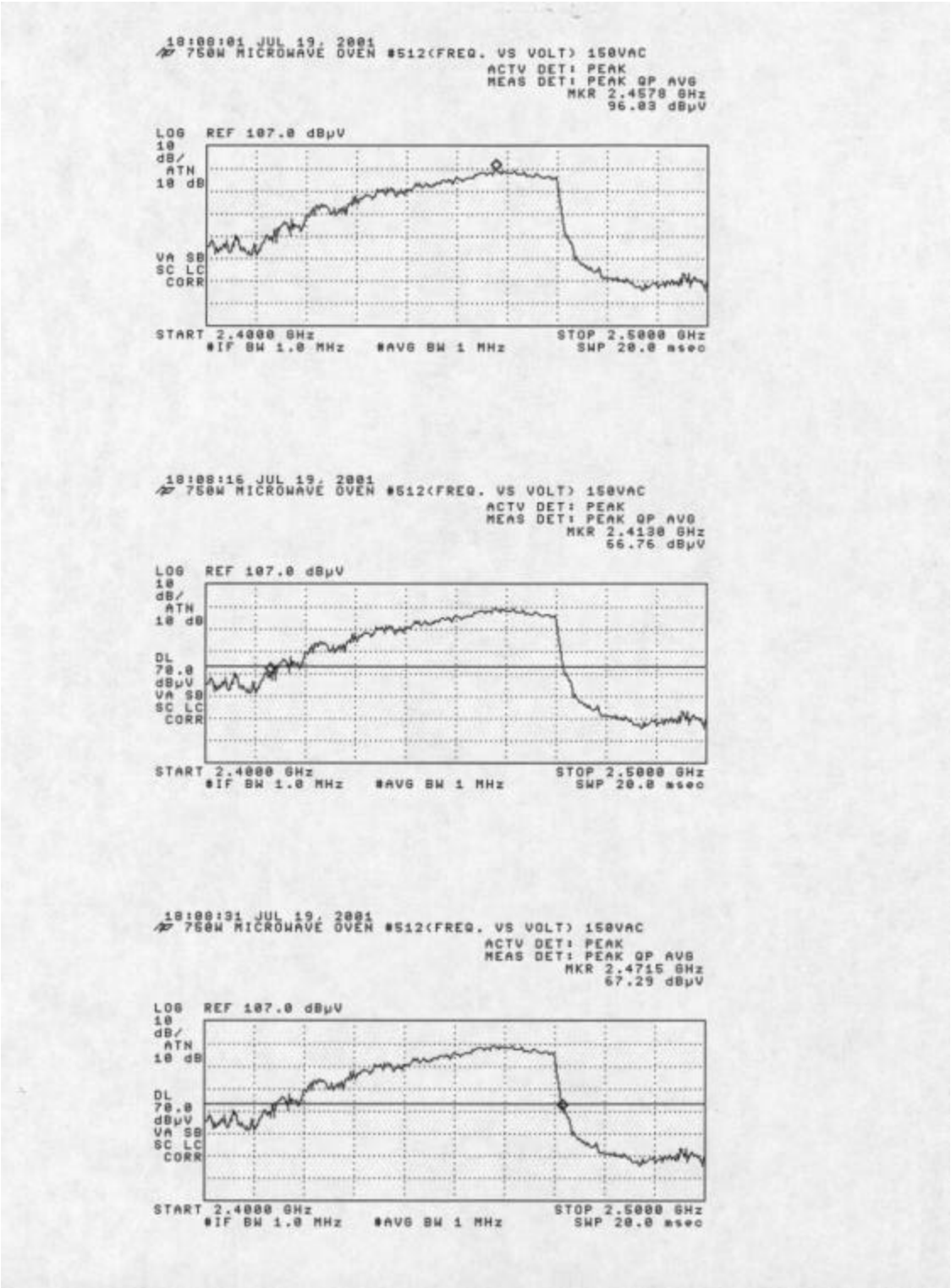




VARIATION IN OPERATING FREQUENCY VS. VOLTAGE PLOTS (150Vac)







USER MANUAL AND SCHEMATICS