FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENT

TEST REPORT

FOR

MICROWAVE OVEN

MODEL NUMBER: R-410

MAGNETRON MODEL: 2M246, 2M226, 2M167B

FCC ID: APYDMR0155

REPORT NUMBER: 05U3270-1

ISSUE DATE: FEBRUARY 16, 2005

Prepared for
SHARP CORPORATION
22-22 NAGAIKE-CHO,
ABENO-KU RELIABILITY CONTROL GROUP
OSAKA, JAPAN, 545-8522

Prepared by
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LAB CODE:200065-0

Revision History

Rev.	Revisions	Revised By

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SHARP ELECTRONIC CORP
22-22 NAGAIKE-CHO,
ABENO-KU RELIABILITY CONTROL GROUP
OSAKA, JAPAN, 545-8522

EUT DESCRIPTION: MICROWAVE OVEN

MODEL NUMBER: R-410

SERIAL NUMBER: 122671

MAGNETRON MODEL: 2M246, 2M226, 2M167B – (VFA)

DATE TESTED: FEBRUARY 10-16, 3005

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 18 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By: Tested By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

The equipment under test is a microwave oven sold for consumer use. Model: R-410 is a 1200W microwave oven with digital controls panel.

Magnetron Model: 2M246, 2M226 and 2M167B

3. TEST FACILITY

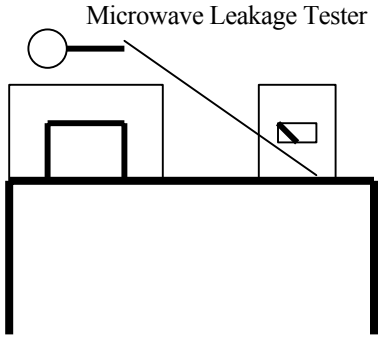
The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

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))

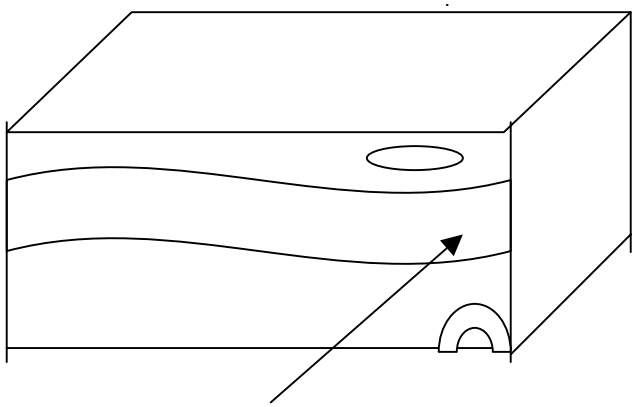
5. RADIO NOISE EMISSION MEASUREMENTS

5.1. RADIATION HAZARD MEASUREMENT



A 700-ml water load was placed in the center of the oven. The power setting was set to10 (100) maximum power. While the oven was operating, the STE probe was moved slowly around the door seams to check for leakage.

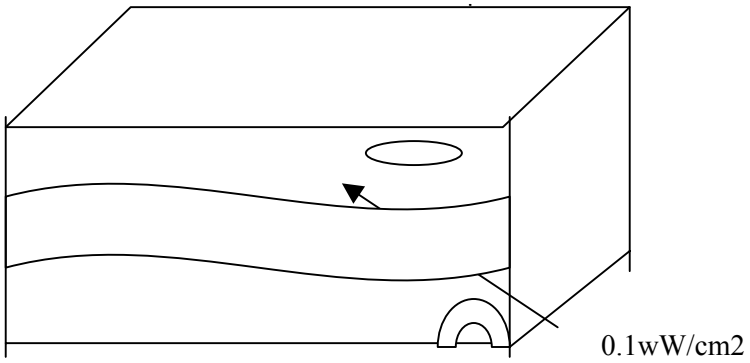
5.1.1. MAGNETRON-2M246



0.2wW/cm2

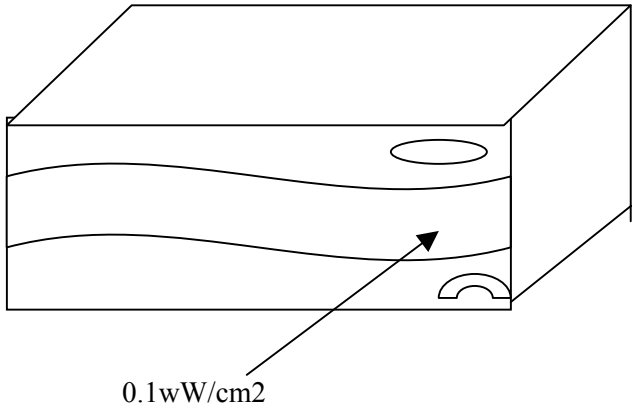
	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	**0.2**	**1.00**
All Others	**0.1**	**1.00**

5.1.2. MAGNETRON-2M226



	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	**0.1**	**1.00**
All Others	**0.05**	**1.00**

5.1.3. MAGNETRON-2M167B



	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	**0.1**	**1.00**
All Others	**0.05**	**1.00**

5.2. INPUT POWER

Input power and current were measured using a wattmeter and an amp-meter. A 700 ml water load was placed in the center of the oven and the oven was set to10 (100%) maximum power. A 700-ml water load was chosen for its compatibility. Manufacturers to determine their input ratings commonly use this procedure.

5.2.1. MAGNETRON-2M246

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	15.6	1794

5.2.2. MAGNETRON-2M226

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	15	1725

5.2.3. MAGNETRON-2M167B

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	15.2	1748

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

5.3. 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.

5.3.1. MAGNETRON-2M246

Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
18.3	40.8	120	787.5
18.55	40.6	120	780.5
18.6	41.1	120	787.5

Average of 3 Trials: 785.2 W

5.3.2. MAGNETRON-2M226

Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
15.6	38	120	784
16	38.2	120	777
16.1	38.4	120	780.5

Average of 3 Trials: 780.5 W

5.3.3. MAGNETRON-2M167B

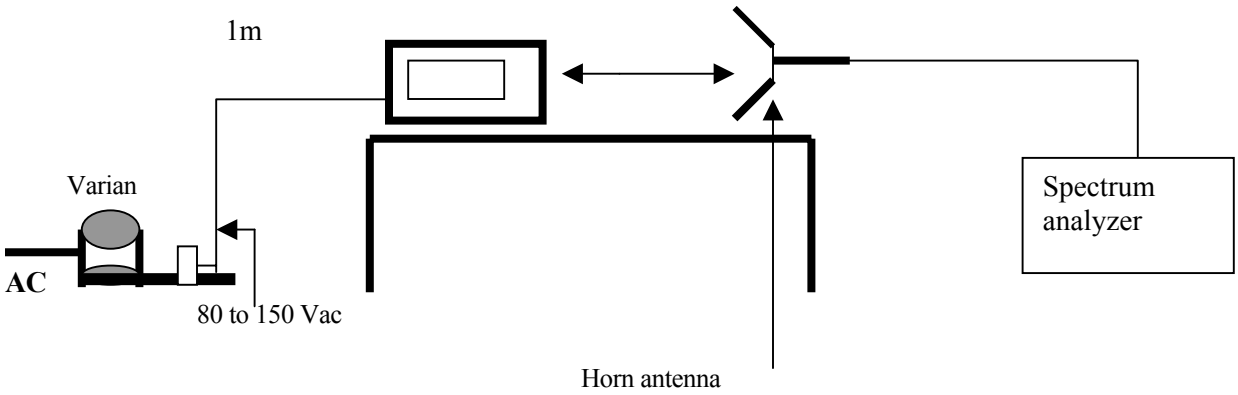
Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
21.7	43.6	120	766.5
21.4	43.1	120	759.5
21.5	43.3	120	763

Average of 3 Trials: 763 W

Power = (4.2 Joules/Cal) x (Volume in ml) x (Temp. Rise)
Time in seconds

The measured output was found to be OVER 500Watts. Therefore, in accordance with section 18.305 of Subpart B, the measured out-of-band emissions were compared to the 25 √Power/500 @ 300m limit.

5.4. OPERATING FREQUENCY MEASUREMENTS



Operating Frequency Measurement Set-up

5.5. 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.

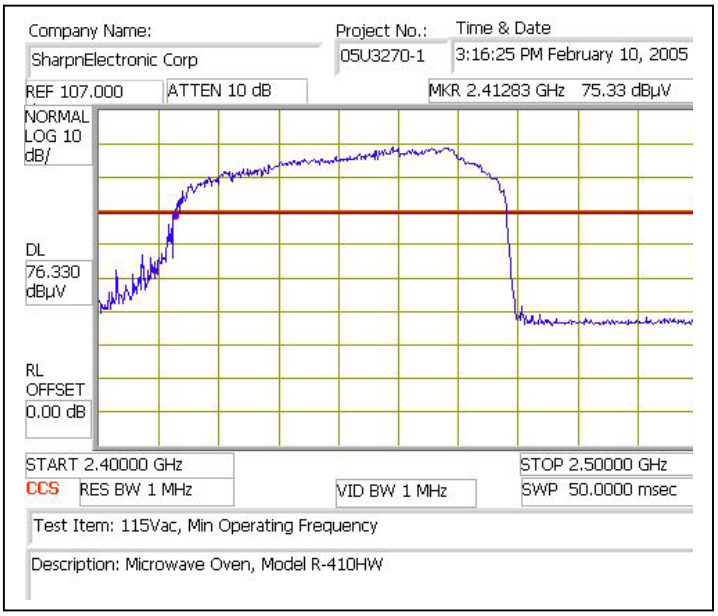
The fundamental operating frequency was monitor until the water load was reduced to 20% of the original load.

The results of this test are as follows.

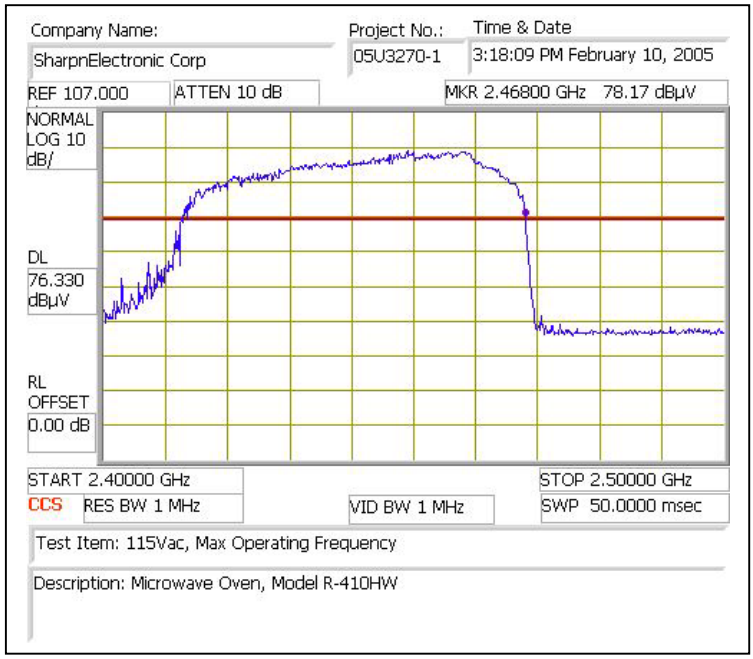
Initial load: 1000 ml
Load at completion of test: 200 ml

5.5.1. MAGNETRON-2M246

	115Vac(MHz)
Minimum Frequency (2400 MHz)	**2412.83**
Maximum Frequency (2500 MHz)	**2468**



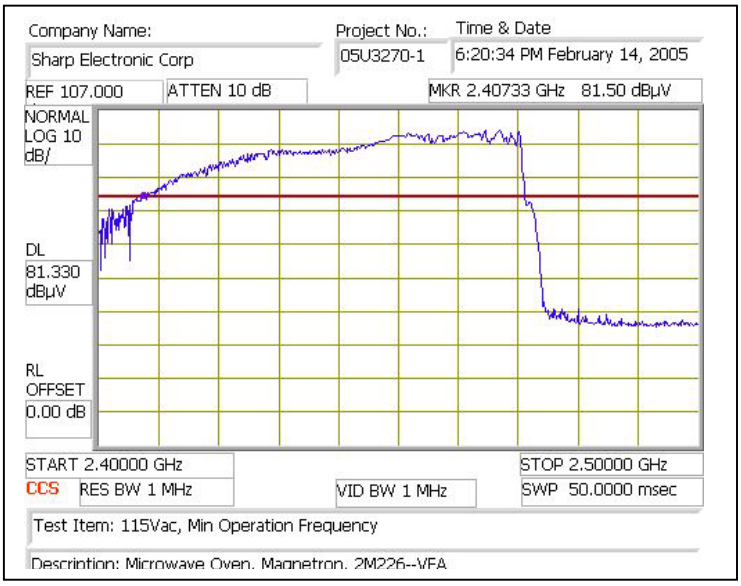
Minimum Frequency @ 115Vac



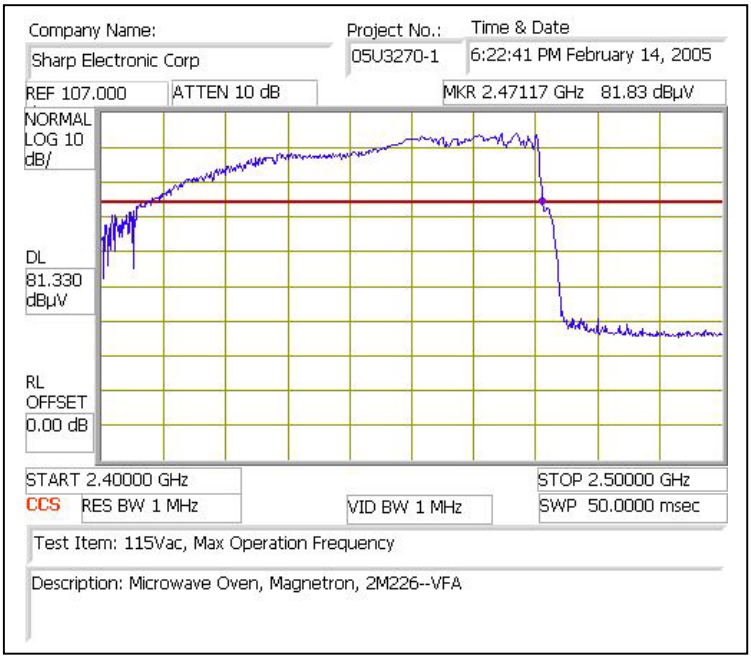
Maximum Frequency @ 115Vac

5.5.2. MAGNETRON-2M226

	115Vac(MHz)
Minimum Frequency (2400 MHz)	**2407.33**
Maximum Frequency (2500 MHz)	**2471.17**



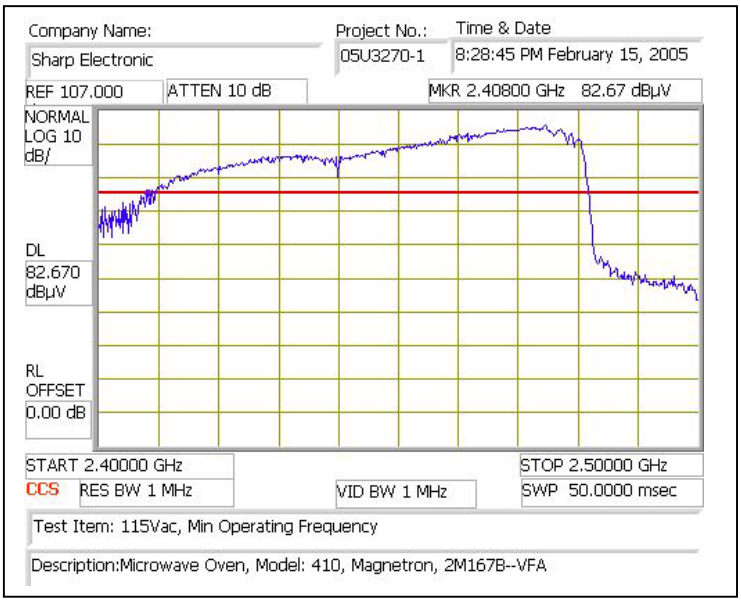
Minimum Frequency @ 115Vac



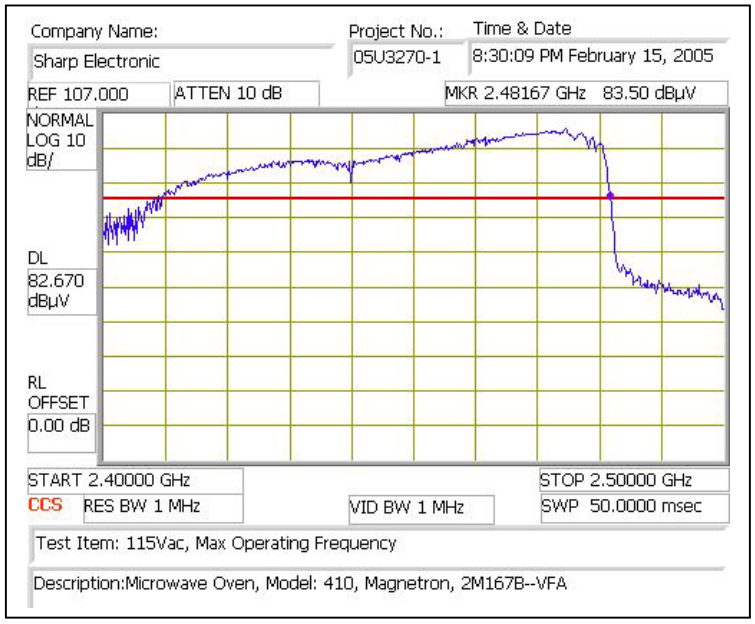
Maximum Frequency @ 115Vac

5.5.3. MAGNETRON-2M167B

	115Vac(MHz)
Minimum Frequency (2400 MHz)	**2408.00**
Maximum Frequency (2500 MHz)	**2481.67**



Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac

5.6. VARIATION IN OPERATING FREQUENCY WITH VOLTAGE

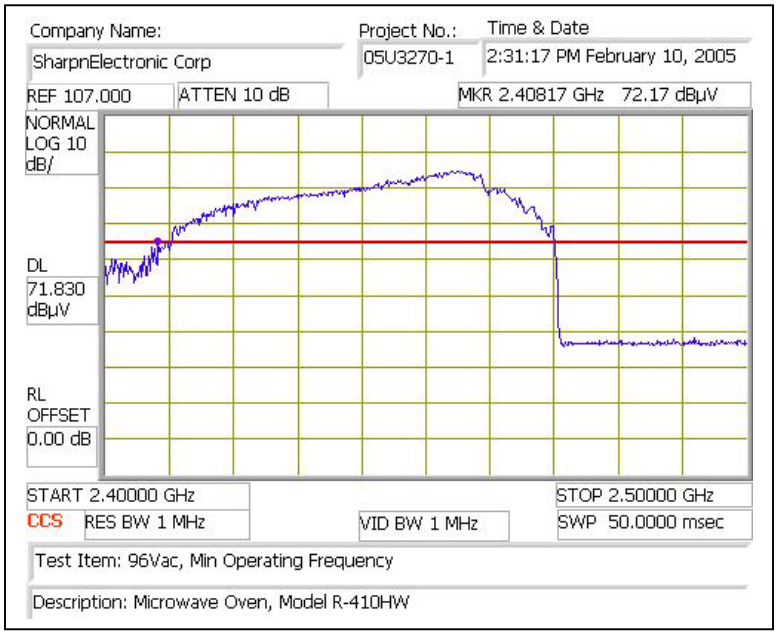
Following the above test, after operating the oven long enough to assure that stable operating temperature were obtained, the operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating.

The water load was maintained at 200 ml for the duration of the test.

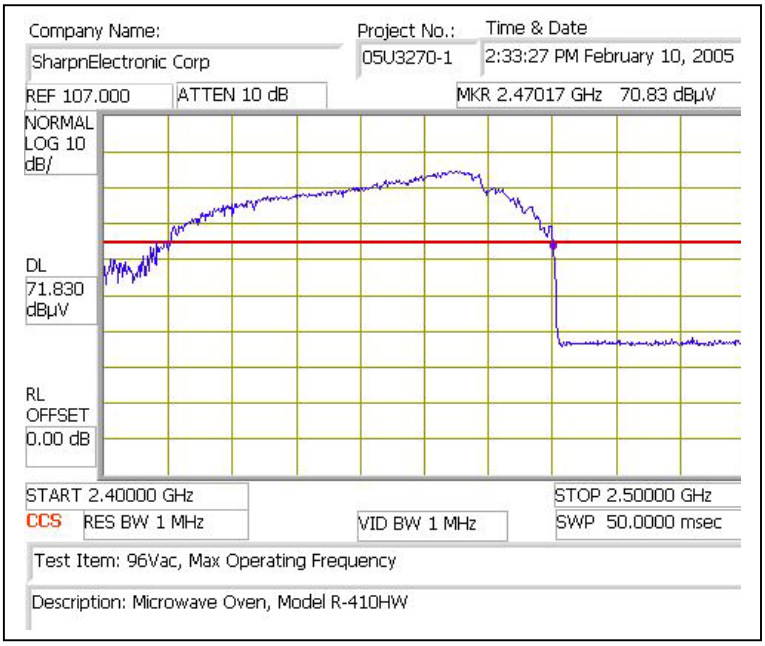
The results of this test are as follows:

5.6.1. MAGNETRON-2M246

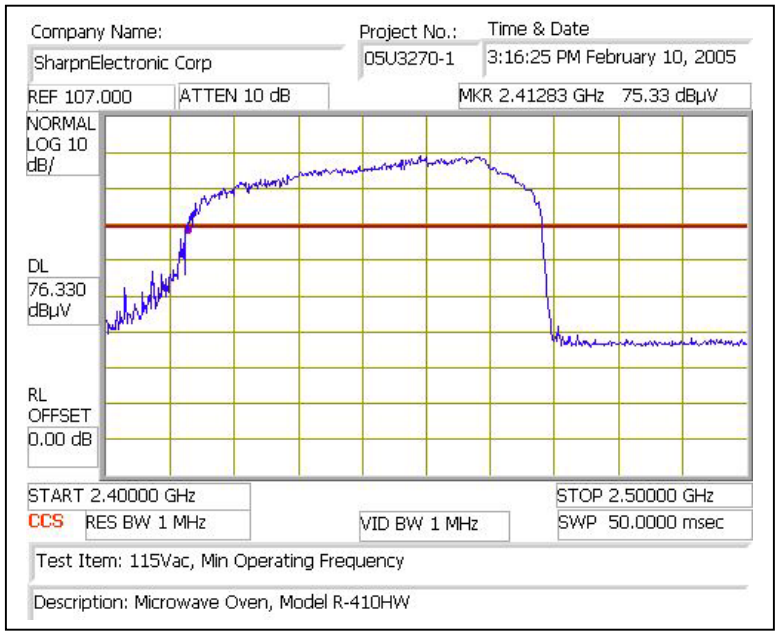
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	**2408.17**	**2412.83**	**2410.33**
Maximum Frequency (2500 MHz)	**2470.17**	**2468**	**2470.33**



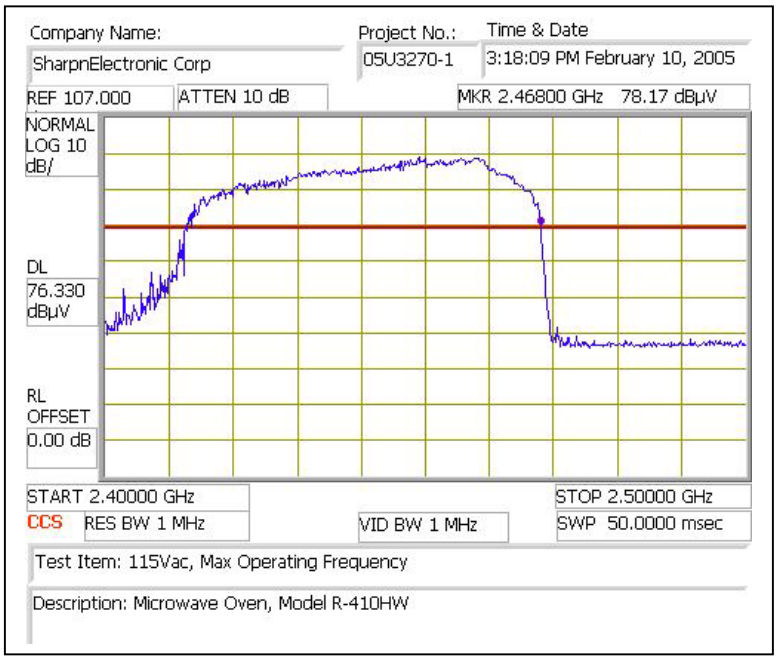
Minimum Frequency @ 96Vac



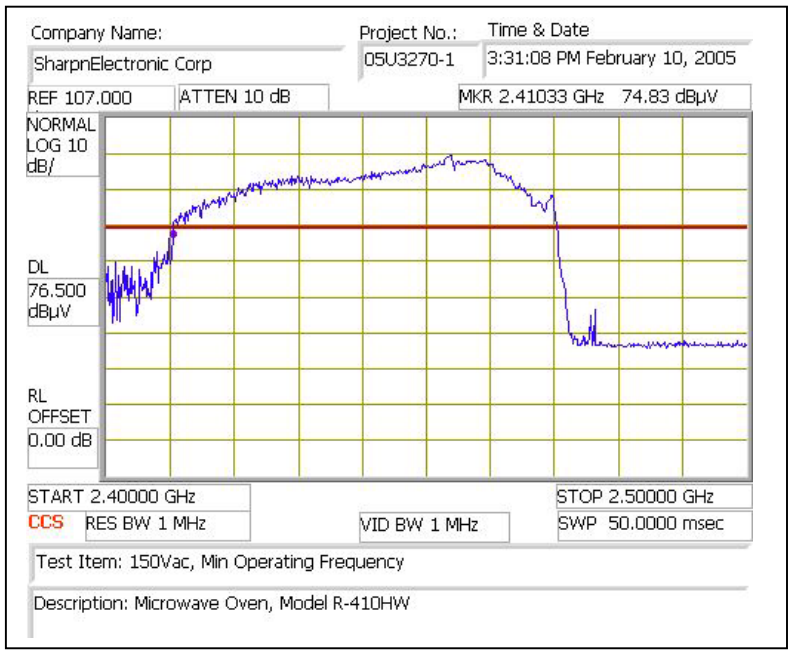
Maximum Frequency @ 96Vac



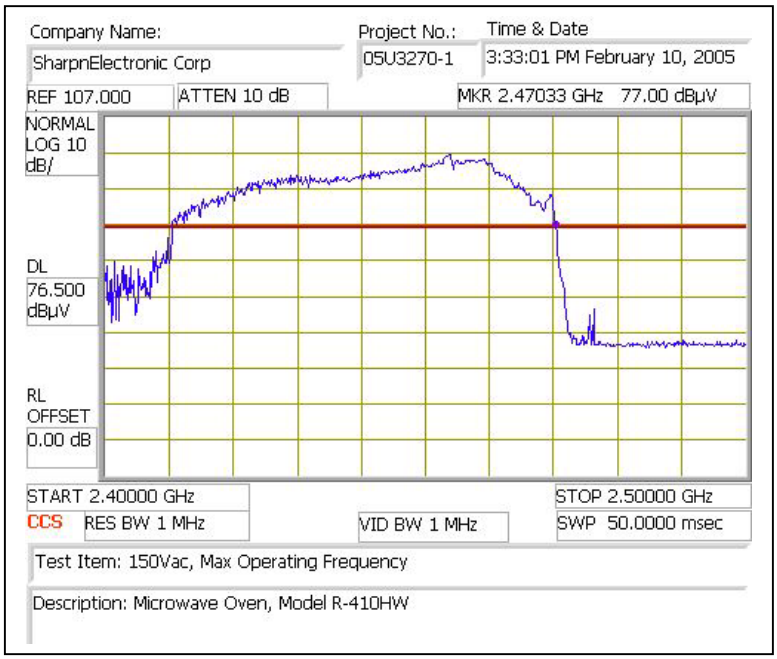
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



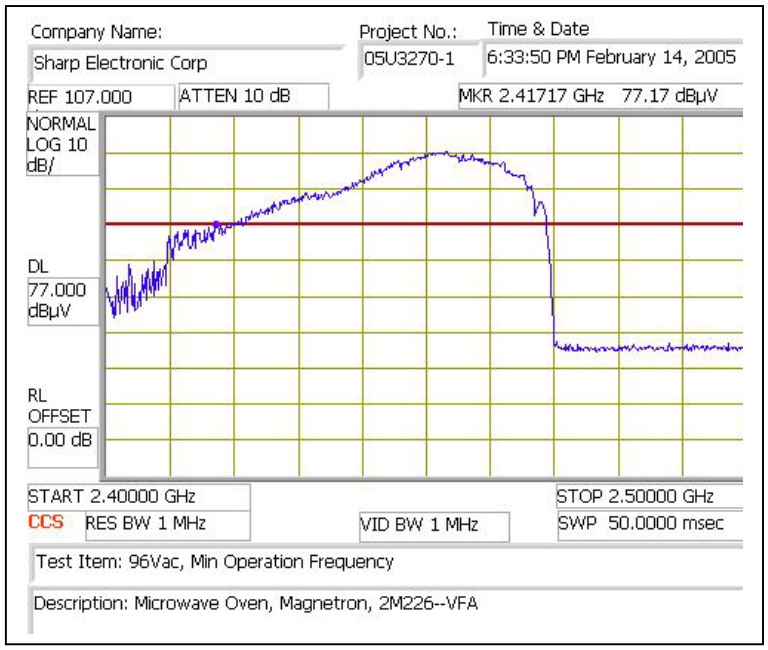
Minimum Frequency @ 150Vac



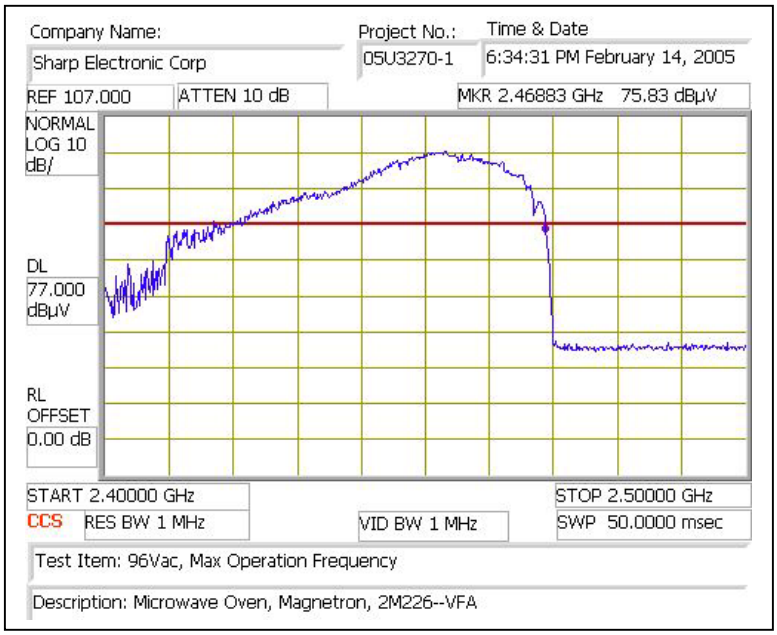
Maximum Frequency @ 150Vac

5.6.2. MAGNETRON-2M226

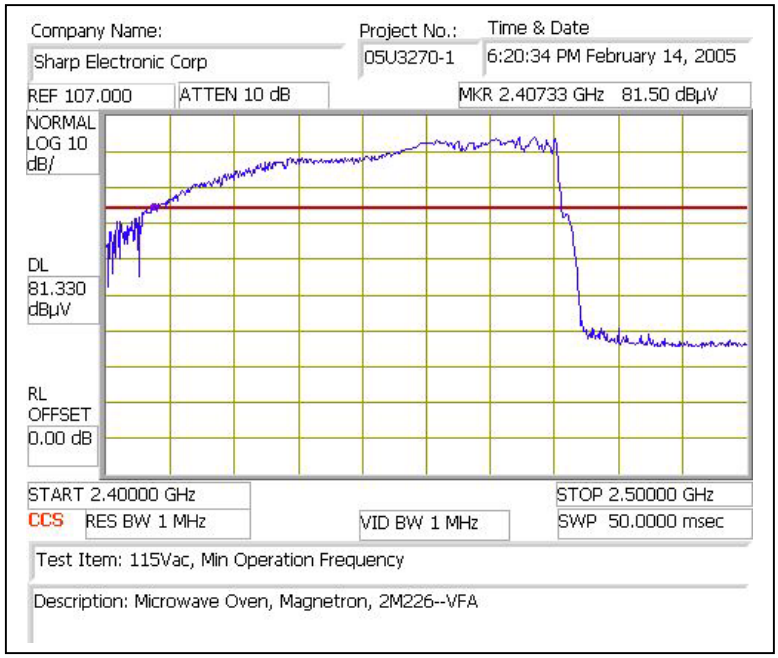
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	**2417.17**	**2407.33**	**2421.50**
Maximum Frequency (2500 MHz)	**2468.83**	**2471.17**	**2470.67**



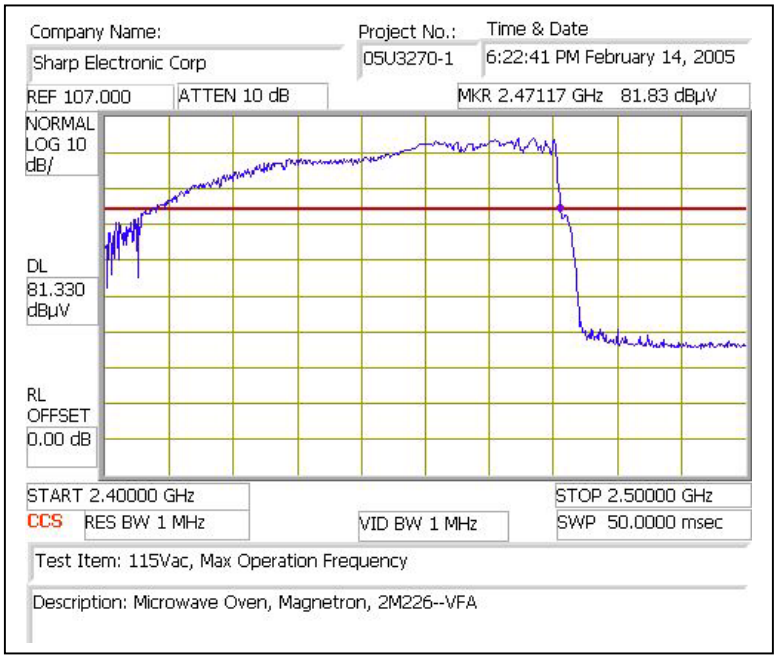
Minimum Frequency @ 96Vac



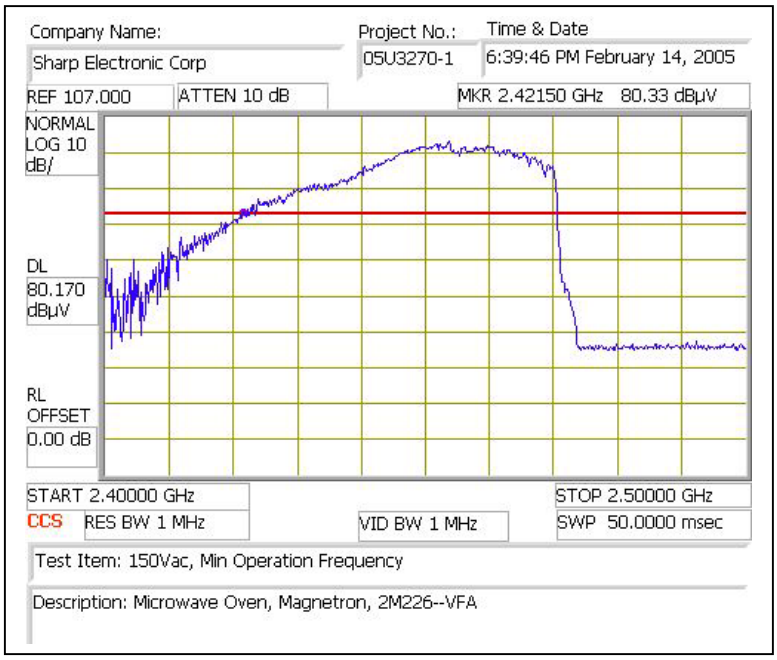
Maximum Frequency @ 96Vac



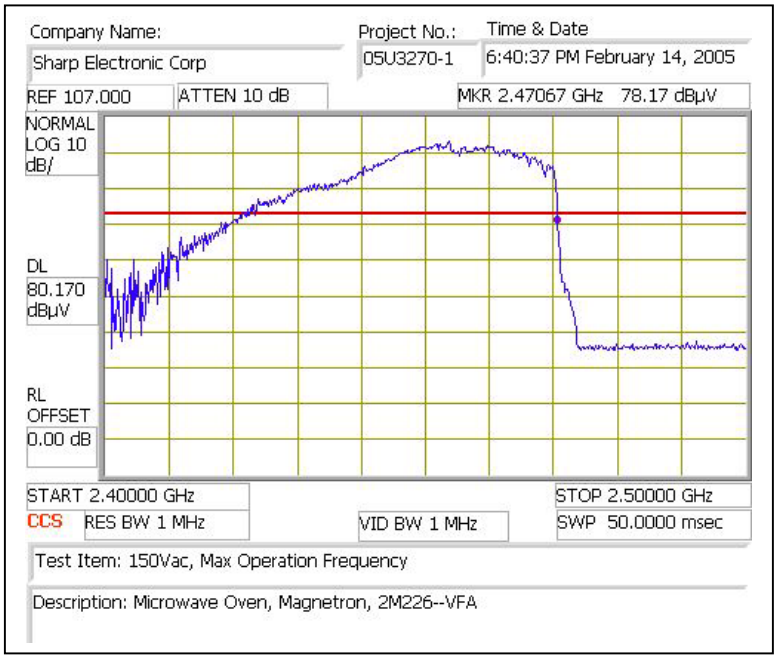
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



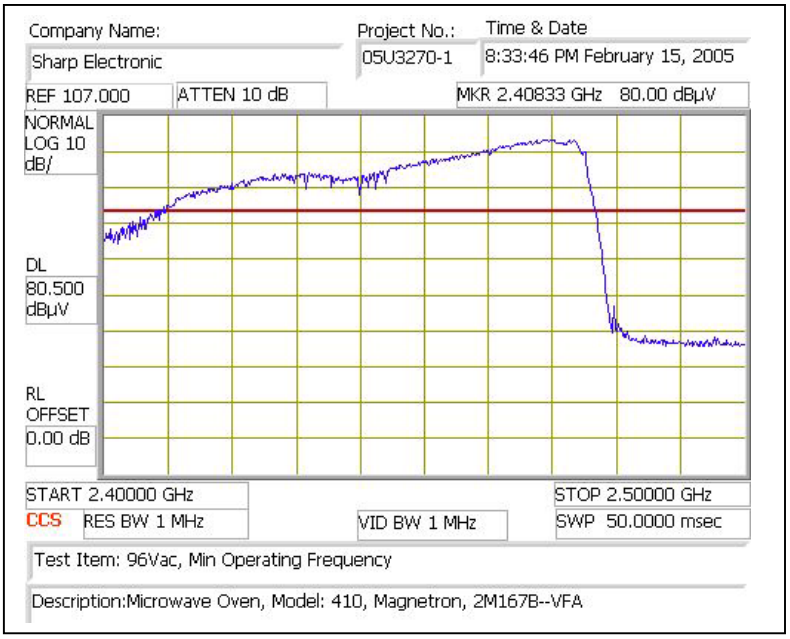
Minimum Frequency @ 150Vac



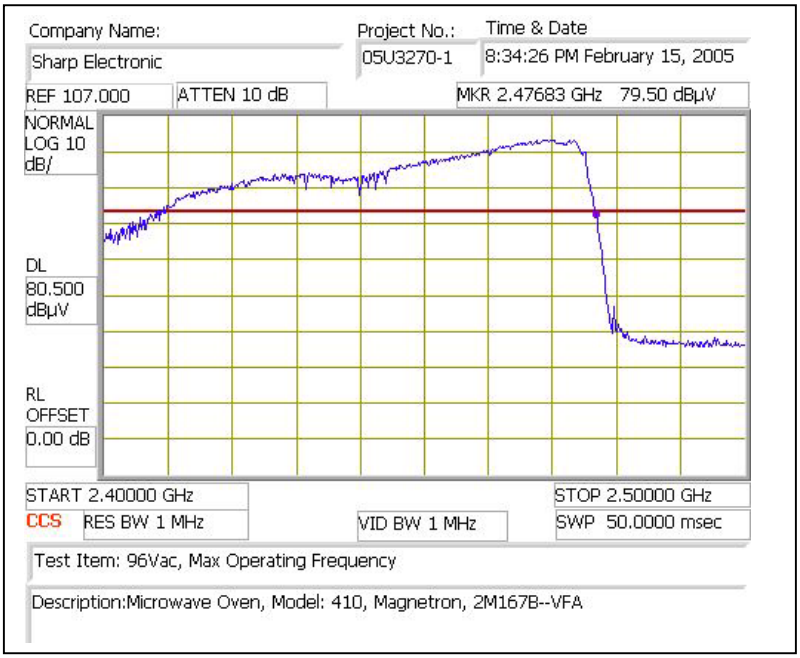
Maximum Frequency @ 150Vac

5.6.3. MAGNETRON-2M167B

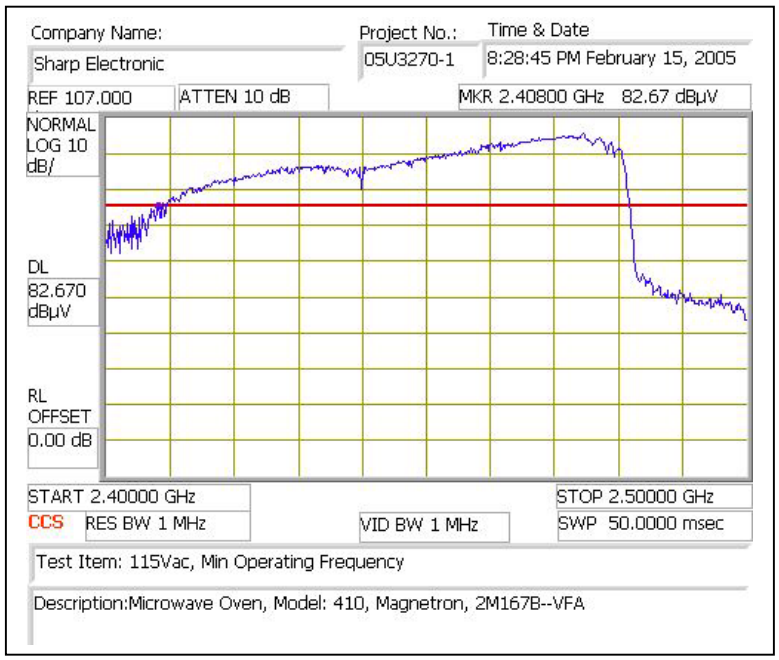
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	**2408.33**	**2408**	**2410.33**
Maximum Frequency (2500 MHz)	**2476.83**	**2481.67**	**2479**



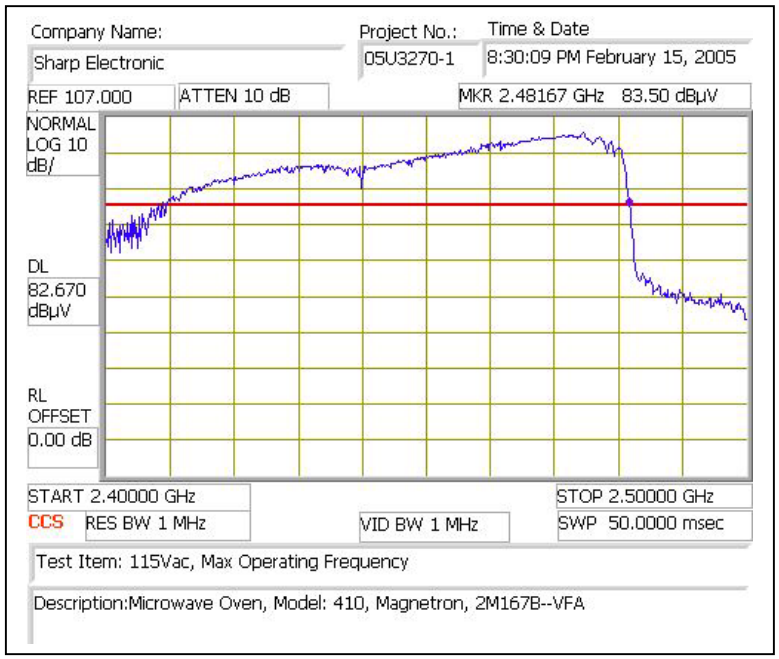
Minimum Frequency @ 96Vac



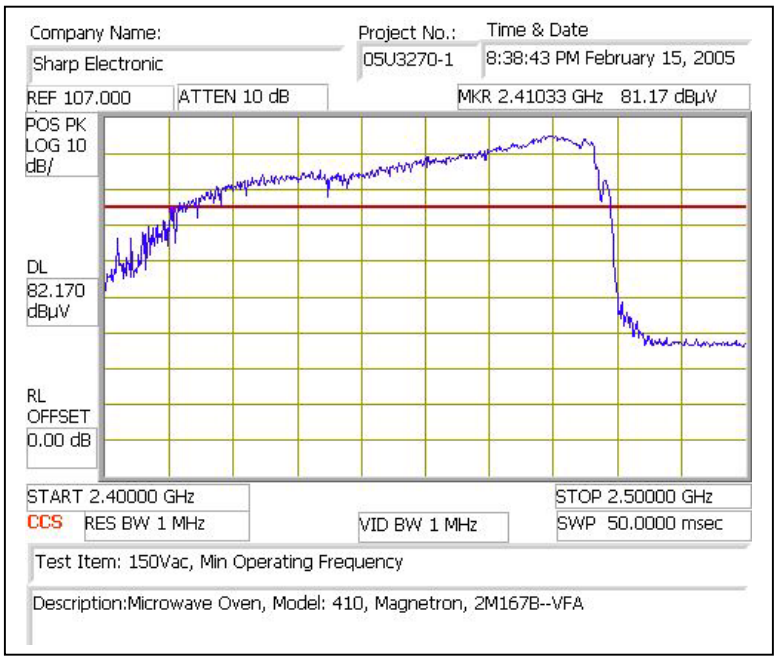
Maximum Frequency @ 96Vac



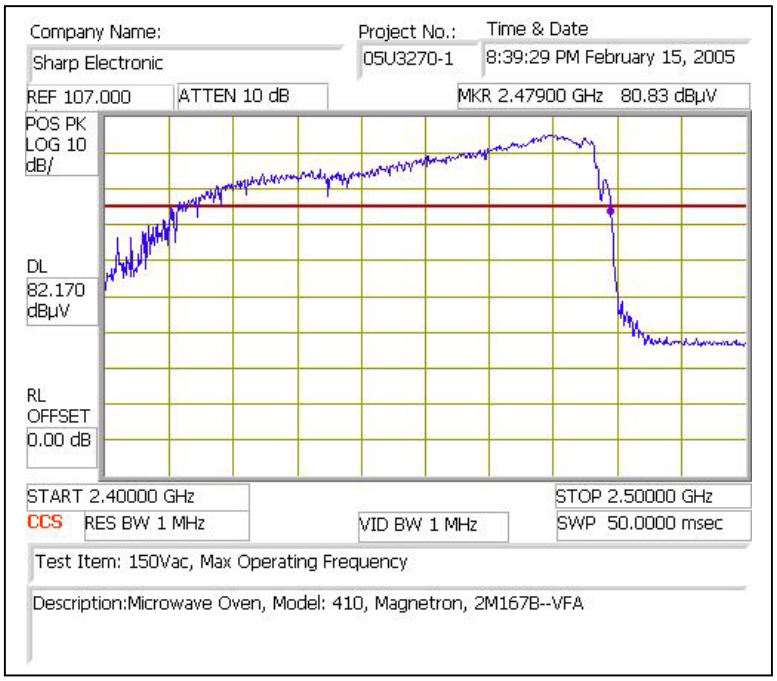
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



Minimum Frequency @ 150Vac



Maximum Frequency @ 150Vac

5.7. RADIATED EMISSIONS 30-1000MHz

Radiated emissions were measured over an inclusive frequency range to 100MHz through the sixth harmonic of the operating frequency. For this test, a 80cm 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 - 14,000MHz, 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.

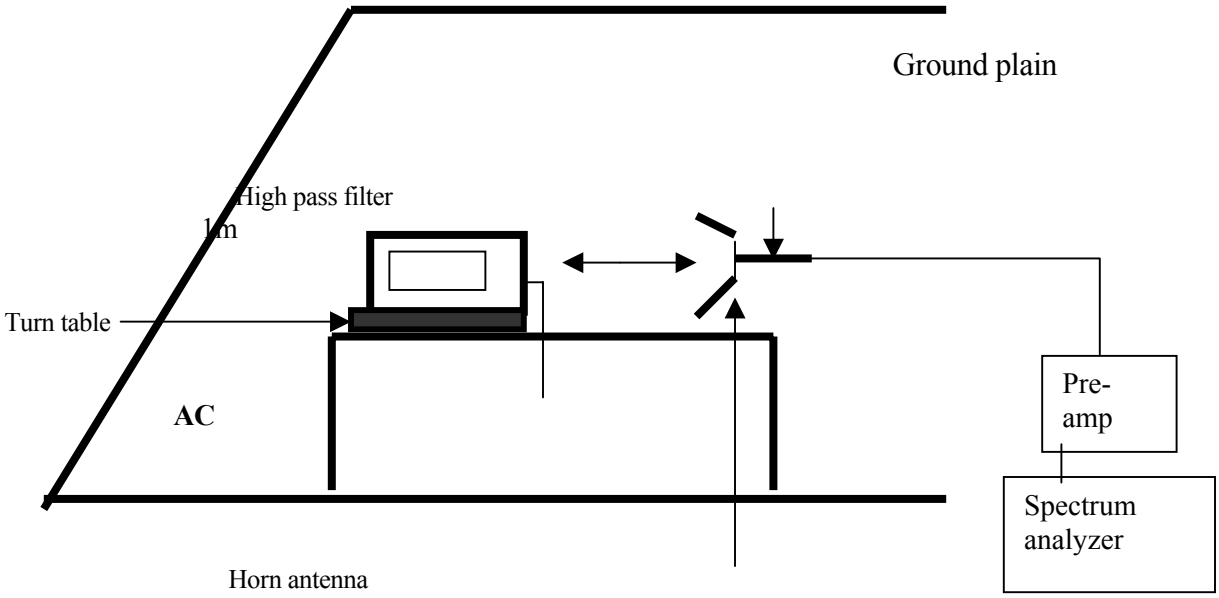
During the preliminary tests, the load consisted of 700-ml tap water placed in the center of the oven. The emissions were observed while the device under test was operated at maximum output power.

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.

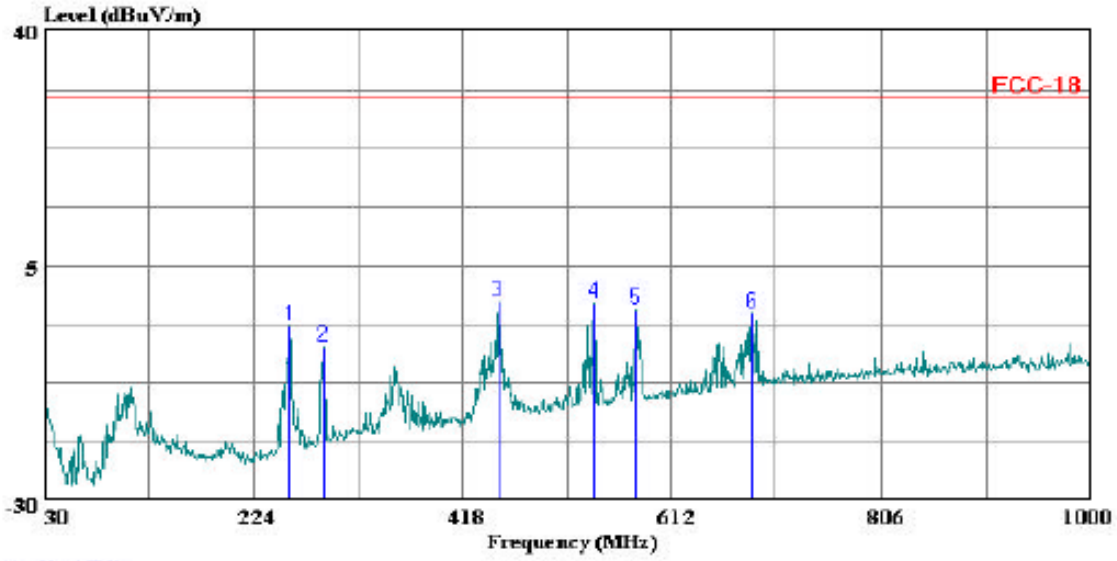


Radiated Emissions Configuration

5.7.1. MAGNETRON-2M246 (HORIZONTAL)

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 4 File#: 3270 emi.EMI Date: 02-11-2005 Time: 08:29:30



(Audix ATC)

Trace: 3 Ref Trace:

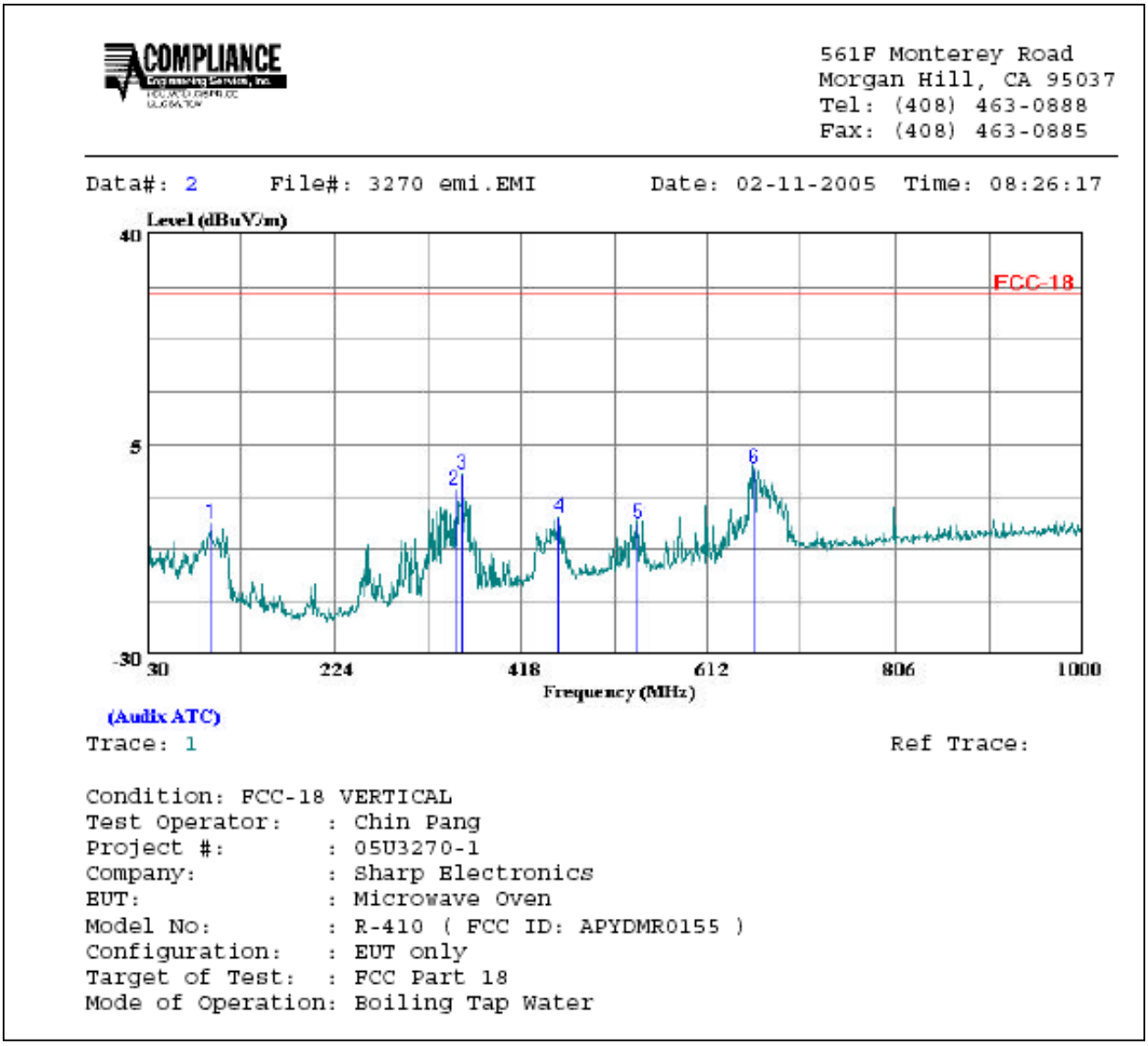
Condition: FCC-18 HORIZONTAL
Test Operator: : Chin Pang
Project #: : 05U3270-1
Company: : Sharp Electronics
EUT: : Microwave Oven
Model No: : R-410 (FCC ID: APYDMR0155)
Configuration: : EUT only
Target of Test: : FCC Part 18
Mode of Operation: Boiling Tap Water

HORIZONTAL DATA,

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	257.950	9.20	-13.37	-4.17	30.00	-34.17	Peak
2	288.990	5.00	-12.30	-7.30	30.00	-37.30	Peak
3	451.950	7.70	-8.25	-0.55	30.00	-30.55	Peak
4	540.220	6.04	-6.61	-0.57	30.00	-30.57	Peak
5	579.020	4.10	-5.83	-1.73	30.00	-31.73	Peak
6	686.690	1.30	-3.45	-2.15	30.00	-32.15	Peak

5.7.2. MAGNETRON-2M246 (VERTICAL)

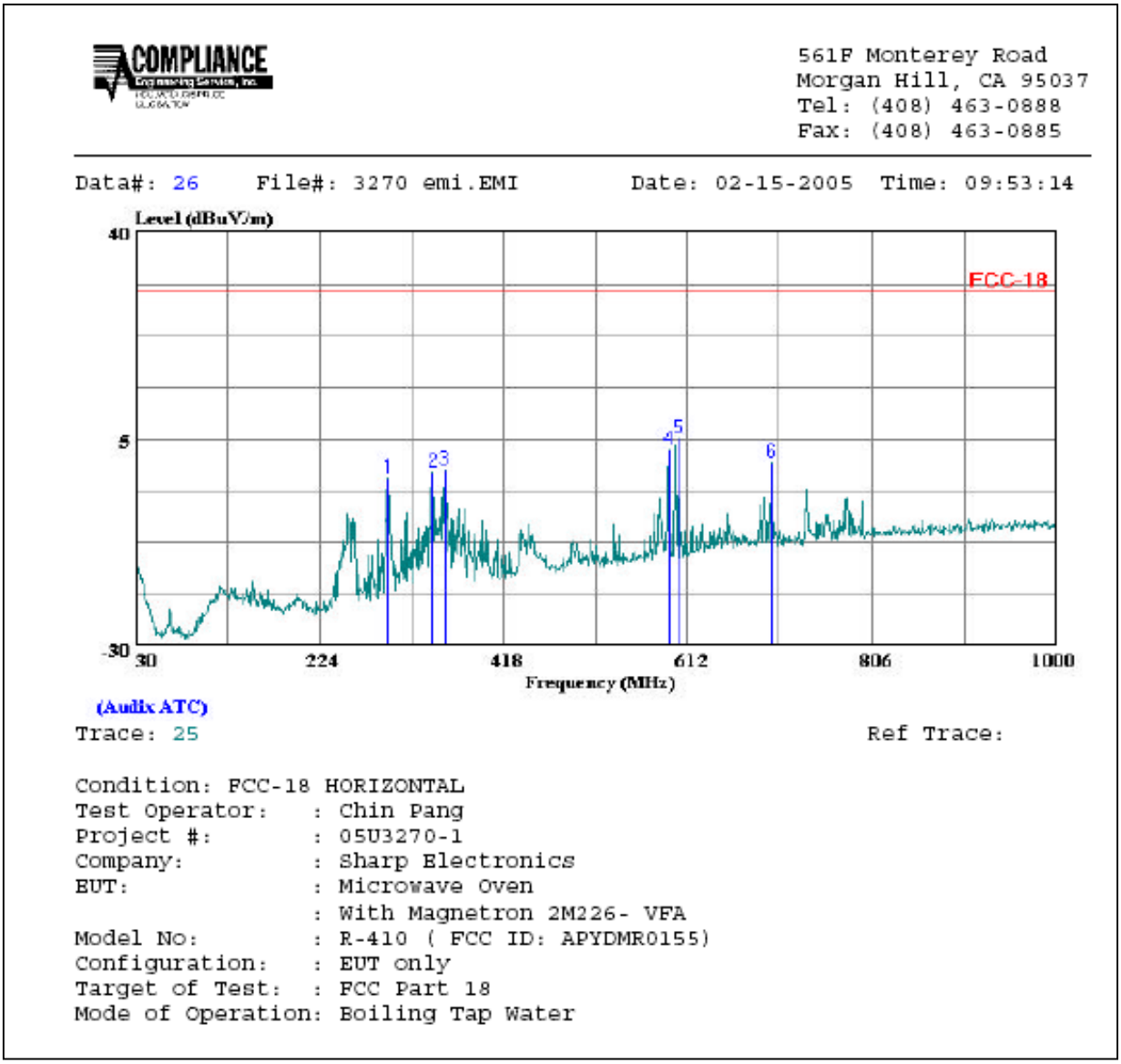


VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	95.960	9.10	-17.41	-8.31	30.00	-38.31	Peak
2	349.130	8.10	-10.64	-2.54	30.00	-32.54	Peak
3	356.890	10.50	-10.50	0.00	30.00	-30.00	Peak
4	457.770	0.80	-8.11	-7.31	30.00	-37.31	Peak
5	539.250	-1.50	-6.61	-8.11	30.00	-38.11	Peak
6	661.470	4.90	-4.00	0.90	30.00	-29.10	Peak

5.7.3. MAGNETRON-2M226 (HORIZONTAL)



HORIZONTAL DATA

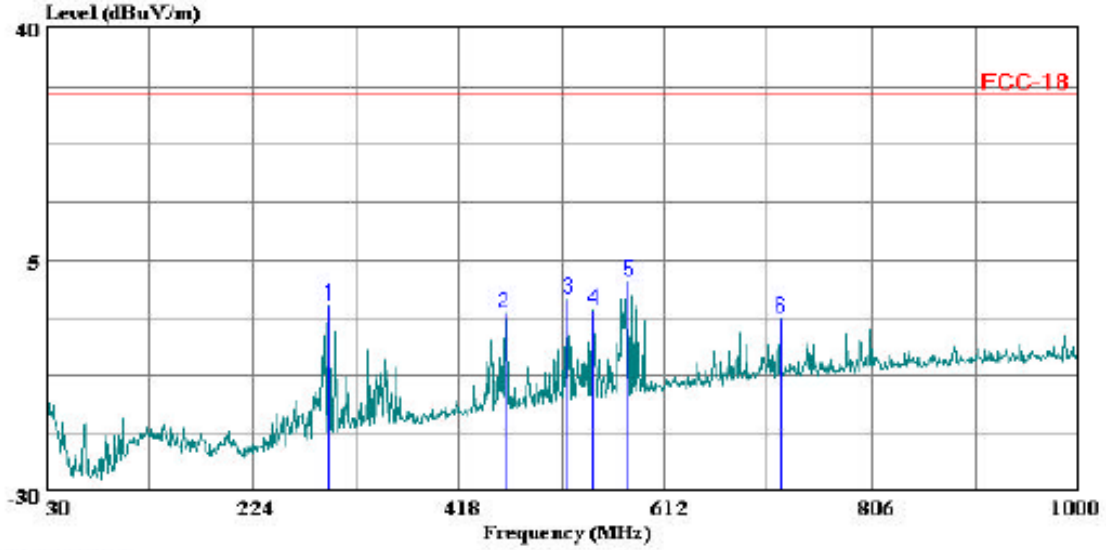
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	296.750	10.30	-11.98	-1.68	30.00	-31.68	Peak
2	343.310	10.24	-10.83	-0.58	30.00	-30.58	Peak
3	355.920	10.30	-10.52	-0.22	30.00	-30.22	Peak
4	592.600	8.80	-5.61	3.19	30.00	-26.81	Peak
5	603.270	10.60	-5.39	5.21	30.00	-24.79	Peak
6	701.240	4.30	-3.24	1.06	30.00	-28.94	Peak

5.7.4. MAGNETRON-2M226 (VERTICAL)

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 30 File#: 3270 emi.EMI Date: 02-15-2005 Time: 10:00:37



(Audix ATC)
Trace: 29 Ref Trace:

Condition: FCC-18 VERTICAL
Test Operator: : Chin Pang
Project #: : 05U3270-1
Company: : Sharp Electronics
EUT: : Microwave Oven
: With Magnetron 2M226- VFA
Model No: : R-410 (FCC ID: APYDMR0155)
Configuration: : EUT only
Target of Test: : FCC Part 18
Mode of Operation: Boiling Tap Water

VERTICAL DATA

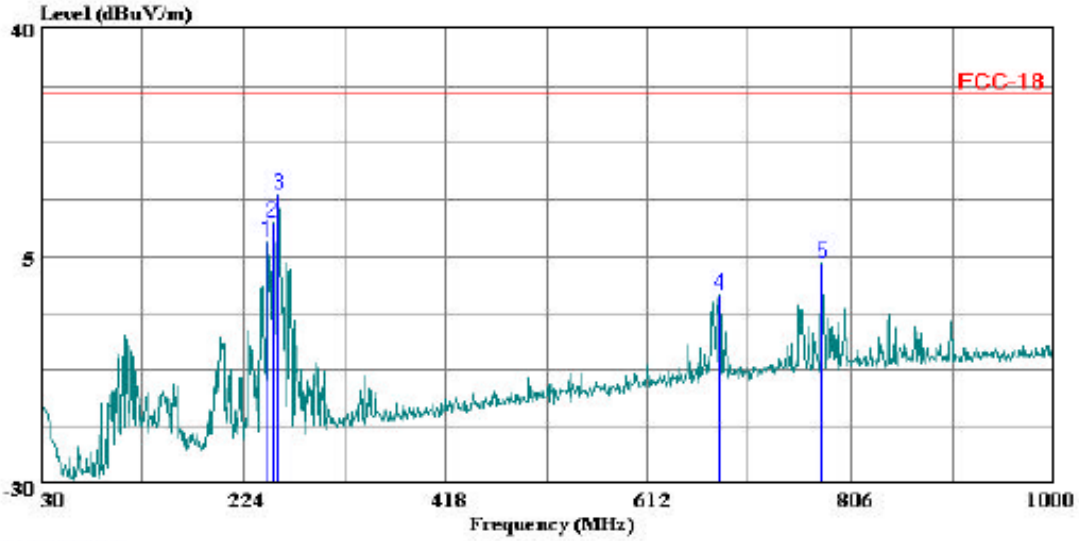
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	296.750	10.10	-11.98	-1.88	30.00	-31.88	Peak
2	461.650	4.90	-8.03	-3.13	30.00	-33.13	Peak
3	520.820	5.89	-6.89	-1.00	30.00	-31.00	Peak
4	545.070	3.80	-6.49	-2.69	30.00	-32.69	Peak
5	578.050	7.70	-5.86	1.84	30.00	-28.16	Peak
6	721.610	-1.10	-2.84	-3.94	30.00	-33.94	Peak

5.7.5. MAGNETRON-2M167B (HORIZONTAL)

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 73 File#: 3270 emi.EMI Date: 02-15-2005 Time: 15:00:05



(Audix ATC)
Trace: 72 Ref Trace:

Condition: FCC-18 HORIZONTAL
Test Operator: : Chin Pang
Project #: : 05U3270-1
Company: : Sharp Electronics
EUT: : Microwave Oven
: With Magnetron 2M167B-- VFA
Model No: : R414 (FCC ID: APYDMR0155)
Configuration: : EUT only
Target of Test: : FCC Part 18
Mode of Operation: Boiling Tap Water

HORIZONTAL DATA

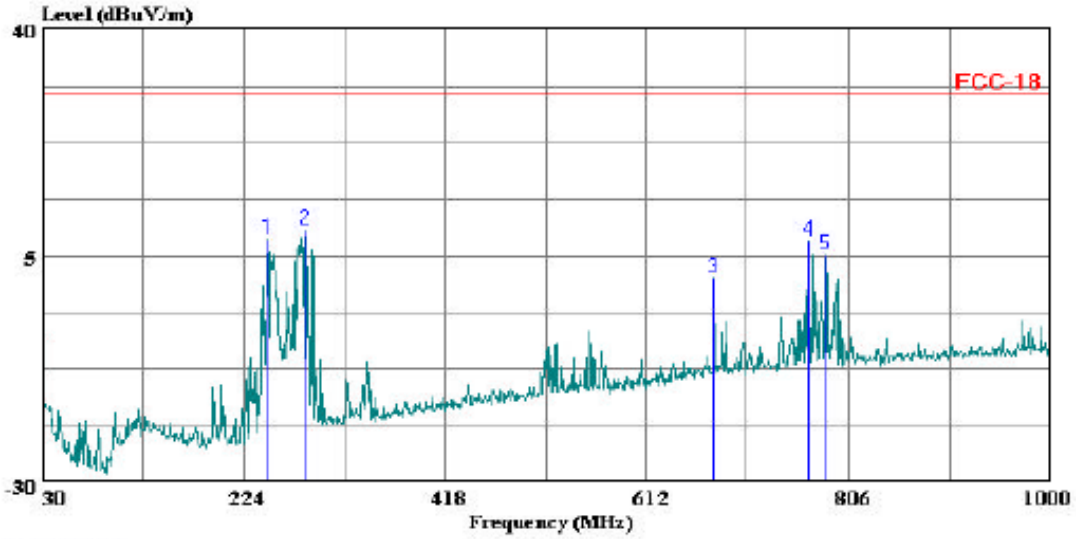
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	247.280	21.15	-13.84	7.30	46.00	-38.70	Peak
2	252.130	23.80	-13.62	10.18	46.00	-35.82	Peak
3	257.950	27.90	-13.37	14.53	46.00	-31.47	Peak
4	680.870	2.50	-3.48	-0.98	46.00	-46.98	Peak
5	777.870	6.09	-2.17	3.93	46.00	-42.07	Peak

5.7.6. MAGNETRON-2M167B (VERTICAL)

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 69 File#: 3270 emi.EMI Date: 02-15-2005 Time: 14:53:25



(Audix ATC)
Trace: 68 Ref Trace:

Condition: FCC-18 VERTICAL
Test Operator: : Chin Pang
Project #: : 05U3270-1
Company: : Sharp Electronics
EUT: : Microwave Oven
: With Magnetron 2M167B-- VFA
Model No: : R414 (FCC ID: APYDMR0155)
Configuration: : EUT only
Target of Test: : FCC Part18
Mode of Operation: Boiling Tap Water

VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	246.310	21.50	-13.84	7.66	30.00	-22.34	Peak
2	284.140	21.40	-12.50	8.90	30.00	-21.10	Peak
3	676.990	5.20	-3.64	1.56	30.00	-28.44	Peak
4	766.230	9.60	-2.33	7.27	30.00	-22.73	Peak
5	783.690	7.30	-2.06	5.24	30.00	-24.76	Peak

5.8. RADIATED EMISSIONS – ABOVE 1GHz

5.8.1. MAGNETRON-2M246

02/14/05 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Chin Pang
Project #: 05U3270-1
Company: Sharp Electronic Corp.
EUT Descrip.: Microwave Oven
EUT M/N: R-410 (FCC ID: APYDMR0155)
Test Target: FCC Part 18
Mode Oper: TX, Boling Tap Water

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	4 foot cable	12 foot cable	HPF	Reject Filter
	3_Chin		12_Neelesh	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
4.910	3.0	87.0	48.5	33.0	3.8	-39.7	-40.0	0.6	44.7	6.2	50.0	30.0	-5.3	-23.8	V
7.350	3.0	72.0	45.2	35.9	4.9	-40.3	-40.0	0.6	33.1	6.3	50.0	30.0	-16.9	-23.7	V
9.800	3.0	67.0	43.0	37.6	5.9	-37.8	-40.0	0.8	33.5	9.5	50.0	30.0	-16.5	-20.5	V
12.250	3.0	56.0	34.0	38.8	6.6	-39.4	-40.0	0.9	22.9	0.9	50.0	30.0	-27.1	-29.1	V
14.700	3.0	70.3	44.5	40.2	7.2	-40.6	-40.0	0.9	38.0	12.2	50.0	30.0	-12.0	-17.8	V
17.150	3.0	61.0	38.2	42.3	7.9	-41.3	-40.0	1.5	31.3	8.5	50.0	30.0	-18.7	-21.5	V
4.910	3.0	83.0	44.0	33.0	3.8	-39.7	-40.0	0.6	40.7	1.7	50.0	30.0	-9.3	-28.3	H
7.350	3.0	64.0	39.0	35.9	4.9	-40.3	-40.0	0.6	25.1	0.1	50.0	30.0	-24.9	-29.9	H
9.800	3.0	68.5	39.0	37.6	5.9	-37.8	-40.0	0.8	35.0	5.5	50.0	30.0	-15.0	-24.5	H
12.250	3.0	54.0	35.7	38.8	6.6	-39.4	-40.0	0.9	20.9	2.6	50.0	30.0	-29.1	-27.4	H
14.700	3.0	68.4	42.0	40.2	7.2	-40.6	-40.0	0.9	36.1	9.7	50.0	30.0	-13.9	-20.3	H
17.150	3.0	62.0	39.0	42.3	7.9	-41.3	-40.0	1.5	32.3	9.3	50.0	30.0	-17.7	-20.7	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

5.8.2. MAGNETRON-2M226

02/14/05 **High Frequency Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Chin Pang
Project #: 05U3270-1
Company: Sharp Electronic Corp.
EUT Descrip.: Microwave Oven, with Magnetron, 2M226, VFA
EUT M/N: R-414 (FCC ID: APYDMR0154)
Test Target: FCC Part 18
Mode Oper: TX, Boiling Tap Water
x

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	4 foot cable	12 foot cable	HPF	Reject Filter
	3_Chin		12_Neelesh	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
4.910	3.0	79.3	53.0	33.0	3.8	-39.7	-40.0	0.6	37.0	10.7	50.0	30.0	-13.0	-19.3	V
7.350	3.0	68.0	45.0	35.9	4.9	-40.3	-40.0	0.6	29.1	6.1	50.0	30.0	-20.9	-23.9	V
9.800	3.0	70.0	44.2	37.6	5.9	-37.8	-40.0	0.8	36.5	10.7	50.0	30.0	-13.5	-19.3	V
12.250	3.0	65.0	43.0	38.8	6.6	-39.4	-40.0	0.9	31.9	9.9	50.0	30.0	-18.1	-20.1	V
14.700	3.0	66.0	44.6	40.2	7.2	-40.6	-40.0	0.9	33.7	12.3	50.0	30.0	-16.3	-17.7	V
17.150	3.0	60.0	40.5	42.3	7.9	-41.3	-40.0	1.5	30.3	10.8	50.0	30.0	-19.7	-19.2	V
4.910	3.0	75.0	48.0	33.0	3.8	-39.7	-40.0	0.6	32.7	5.7	50.0	30.0	-17.3	-24.3	H
7.350	3.0	65.5	44.3	35.9	4.9	-40.3	-40.0	0.6	26.6	5.4	50.0	30.0	-23.4	-24.6	H
9.800	3.0	74.0	46.5	37.6	5.9	-37.8	-40.0	0.8	40.5	13.0	50.0	30.0	-9.5	-17.0	H
12.250	3.0	54.5	38.3	38.8	6.6	-39.4	-40.0	0.9	21.4	5.2	50.0	30.0	-28.6	-24.8	H
14.700	3.0	64.0	42.5	40.2	7.2	-40.6	-40.0	0.9	31.7	10.2	50.0	30.0	-18.3	-19.8	H
17.150	3.0	65.7	44.0	42.3	7.9	-41.3	-40.0	1.5	36.0	14.3	50.0	30.0	-14.0	-15.7	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

5.8.3. MAGNETRON-2M167B

02/14/05 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Chin Pang
Project #: 05U3270-1
Company: Sharp Electronic Corp.
EUT Descrip.: Microwave Oven, with Magnetron, 2M167B (RV-MZA332WRZZ), VFA
EUT M/N: R-414 (FCC ID: APYDMR0154)
Test Target: FCC Part 18
Mode Oper: TX, Boiling Tap Water
x

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T87 Miteq 924342			FCC 15.209

Hi Frequency Cables

2 foot cable	3 foot cable	4 foot cable	12 foot cable	HPF	Reject Filter
	3_Chin		12_Neelesh	HPF_4.0GHz	

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
4.910	3.0	69.0	43.6	33.0	3.8	-39.7	-40.0	0.6	26.7	1.3	50.0	30.0	-23.3	-28.7	V
7.350	3.0	80.0	50.0	35.9	4.9	-40.3	-40.0	0.6	41.1	11.1	50.0	30.0	-8.9	-18.9	V
9.800	3.0	62.0	42.4	37.6	5.9	-37.8	-40.0	0.8	28.5	8.9	50.0	30.0	-21.5	-21.1	V
12.250	3.0	60.0	40.3	38.8	6.6	-39.4	-40.0	0.9	26.9	7.2	50.0	30.0	-23.1	-22.8	V
14.700	3.0	62.0	43.0	40.2	7.2	-40.6	-40.0	0.9	29.7	10.7	50.0	30.0	-20.3	-19.3	V
17.150	3.0	64.5	44.2	42.3	7.9	-41.3	-40.0	1.5	34.8	14.5	50.0	30.0	-15.2	-15.5	V
4.910	3.0	68.0	44.0	33.0	3.8	-39.7	-40.0	0.6	25.7	1.7	50.0	30.0	-24.3	-28.3	H
7.350	3.0	82.0	51.0	35.9	4.9	-40.3	-40.0	0.6	43.1	12.1	50.0	30.0	-6.9	-17.9	H
9.800	3.0	60.0	39.3	37.6	5.9	-37.8	-40.0	0.8	26.5	5.8	50.0	30.0	-23.5	-24.2	H
12.250	3.0	59.5	38.0	38.8	6.6	-39.4	-40.0	0.9	26.4	4.9	50.0	30.0	-23.6	-25.1	H
14.700	3.0	56.0	38.0	40.2	7.2	-40.6	-40.0	0.9	23.7	5.7	50.0	30.0	-26.3	-24.3	H
17.150	3.0	62.0	42.0	42.3	7.9	-41.3	-40.0	1.5	32.3	12.3	50.0	30.0	-17.7	-17.7	H

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

5.9. CONDUCTED EMISSIONS

Preliminary Conducted Emission Tests were performed according to CCS test procedure no: CCSUE2004B and EN55011/CISPR11. The following preliminary tests were conducted to determine the worst mode of operation.

Preliminary Conducted Emission Test			
Frequency Range Investigated		150 kHz TO 30 MHz	
Mode of operation	Date	Data Report/Plot No.	Worst Mode
Boiling tap water	**2/14/05**	**05U3270-1**	☒

Final Conducted Emission Test was conducted by operating the worst mode as indicated above.

5.9.1. MAGNETRON-2M246

CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	44.24	--	--	0.00	66.00	56.00	-21.76	-11.76	L1
0.21	39.58	--	--	0.00	63.28	53.28	-23.70	-13.70	L1
3.44	29.22	--	--	0.00	56.00	46.00	-26.78	-16.78	L1
0.15	45.54	--	--	0.00	65.84	55.84	-20.30	-10.30	L2
0.21	45.18	--	--	0.00	63.13	53.13	-17.95	-7.95	L2
3.44	28.42	--	--	0.00	56.00	46.00	-27.58	-17.58	L2

6 Worst Data
Magnetron-2M246 (VFA)

5.9.2. MAGNETRON-2M226

CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	40.68	--	--	0.00	65.89	55.89	-25.21	-15.21	L1
0.97	29.06	--	--	0.00	56.00	46.00	-26.94	-16.94	L1
24.01	33.98	--	--	0.00	60.00	50.00	-26.02	-16.02	L1
0.18	40.74	--	--	0.00	64.63	54.63	-23.89	-13.89	L2
18.33	31.86	--	--	0.00	60.00	50.00	-28.14	-18.14	L2
24.01	34.52	--	--	0.00	60.00	50.00	-25.48	-15.48	L2

6 Worst Data
Magnetron-2M226 (VFA)

5.9.3. MAGNETRON-2M167B

CONDUCTED EMISSIONS DATA (115VAC 60Hz)

Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.19	37.82	--	--	0.00	63.91	53.91	-26.09	-16.09	L1
1.52	48.16	--	9.17	0.00	56.00	46.00	-7.84	-36.83	L1
8.82	32.62	--	--	0.00	60.00	50.00	-27.38	-17.38	L1
0.19	42.35	--	--	0.00	64.26	54.26	-21.91	-11.91	L2
0.85	37.00	--	--	0.00	56.00	46.00	-19.00	-9.00	L2
3.44	40.74	--	--	0.00	56.00	46.00	-15.26	-5.26	L2
6 Worst Data									
Magnetron-2M167B(VFA)									

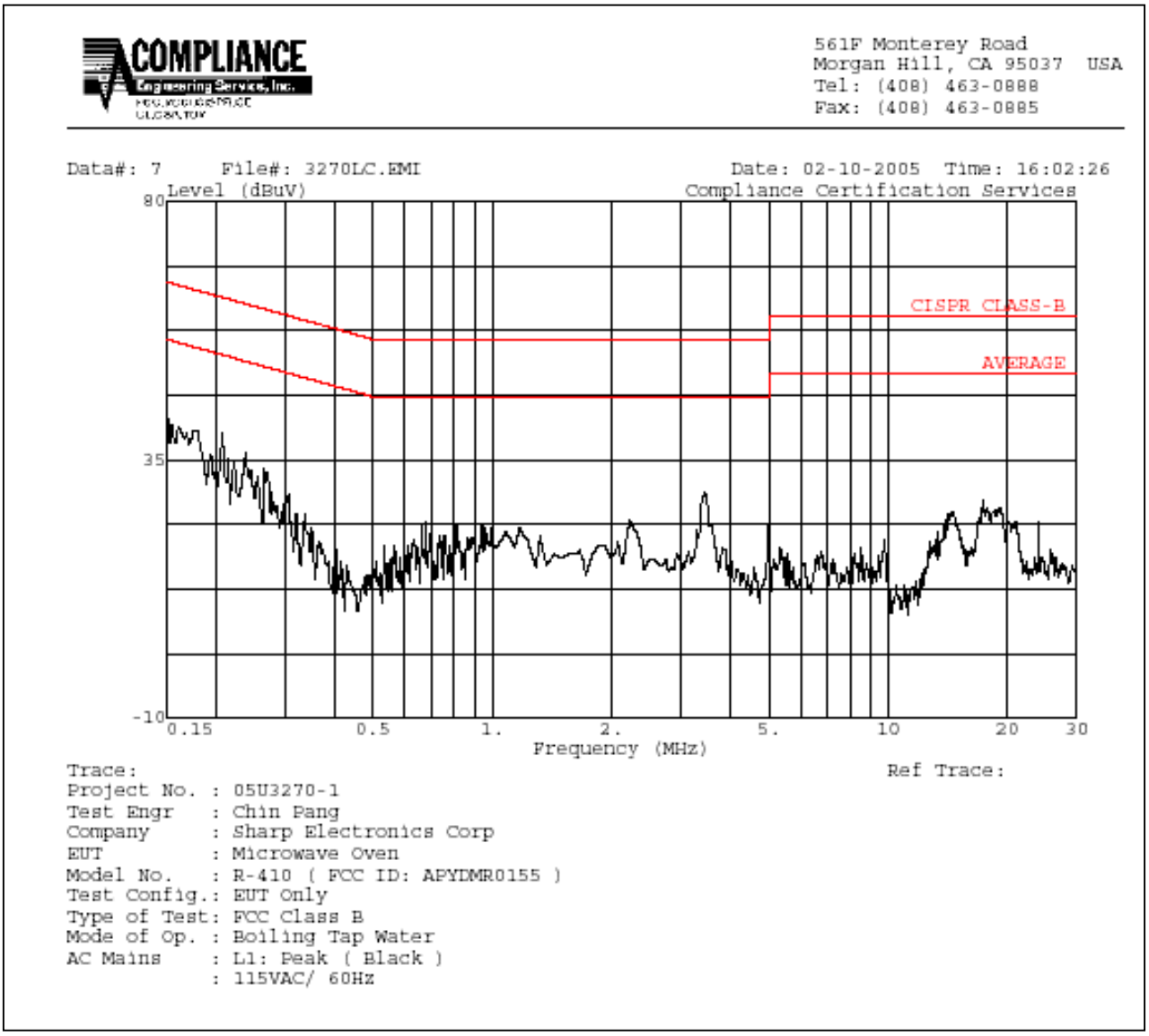
C.F.(Correction Factor)=Insertion Loss + Cable Loss
Corrected Reading = Metering Reading + C.F.
Margin=Corrected Reading - Limits
P=Peak Reading L1=Hot
Q=Quasi-peak L2=Neutral
A=Average Reading

Comments: N/A

Conducted Emission Plot

MAGNETRON-2M246

LINE 1



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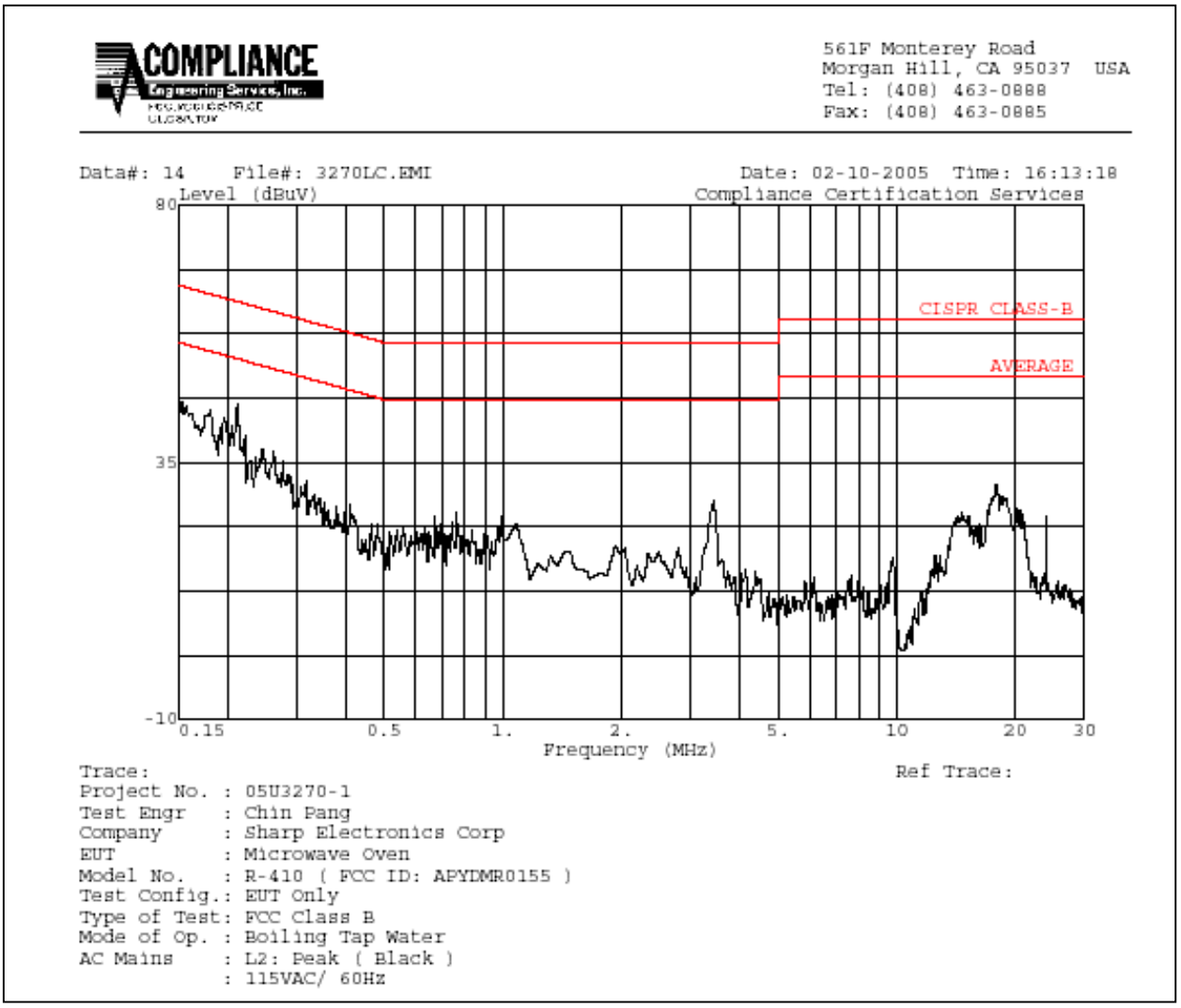
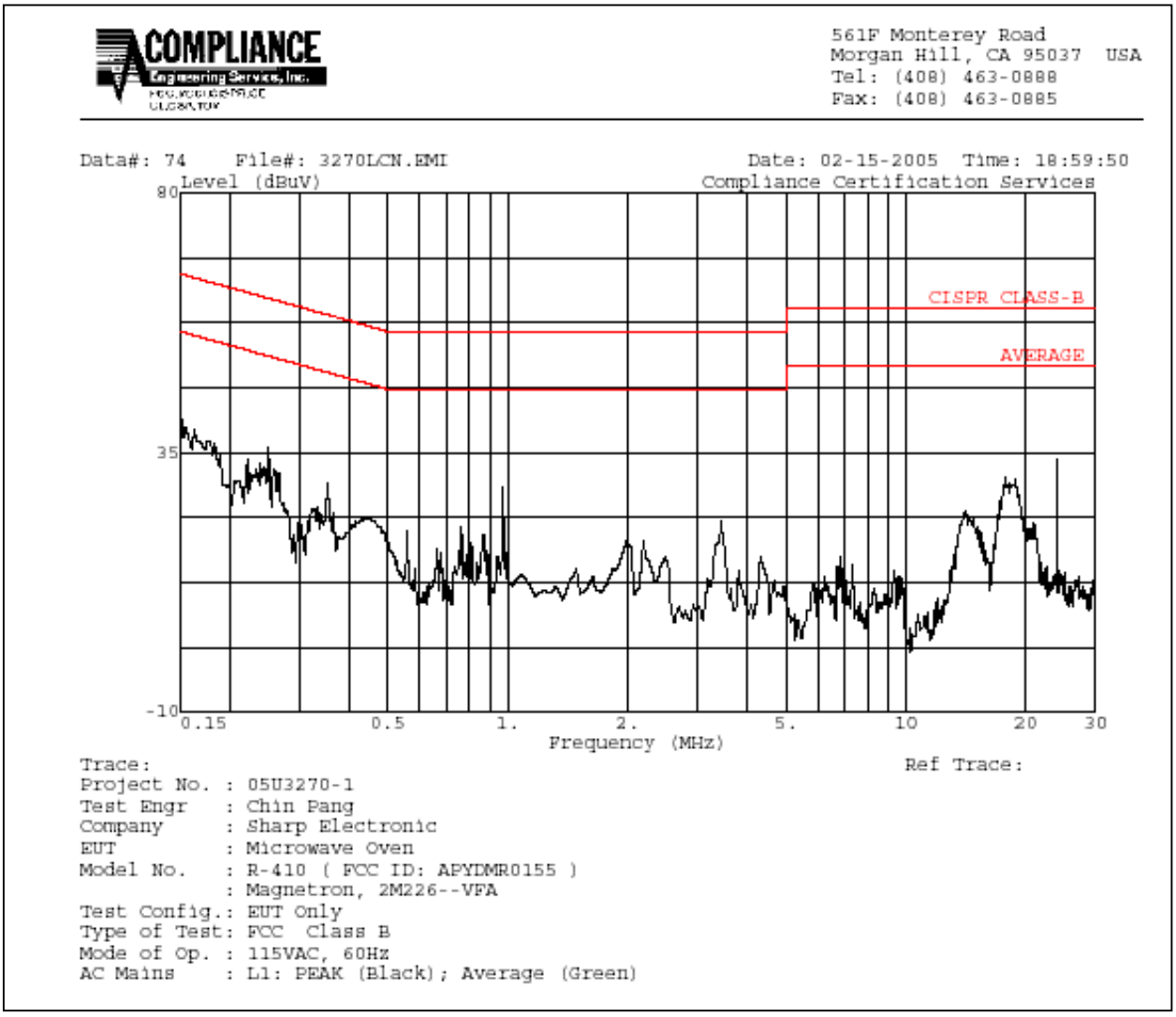


MAGNETRON-2M226

LINE 1



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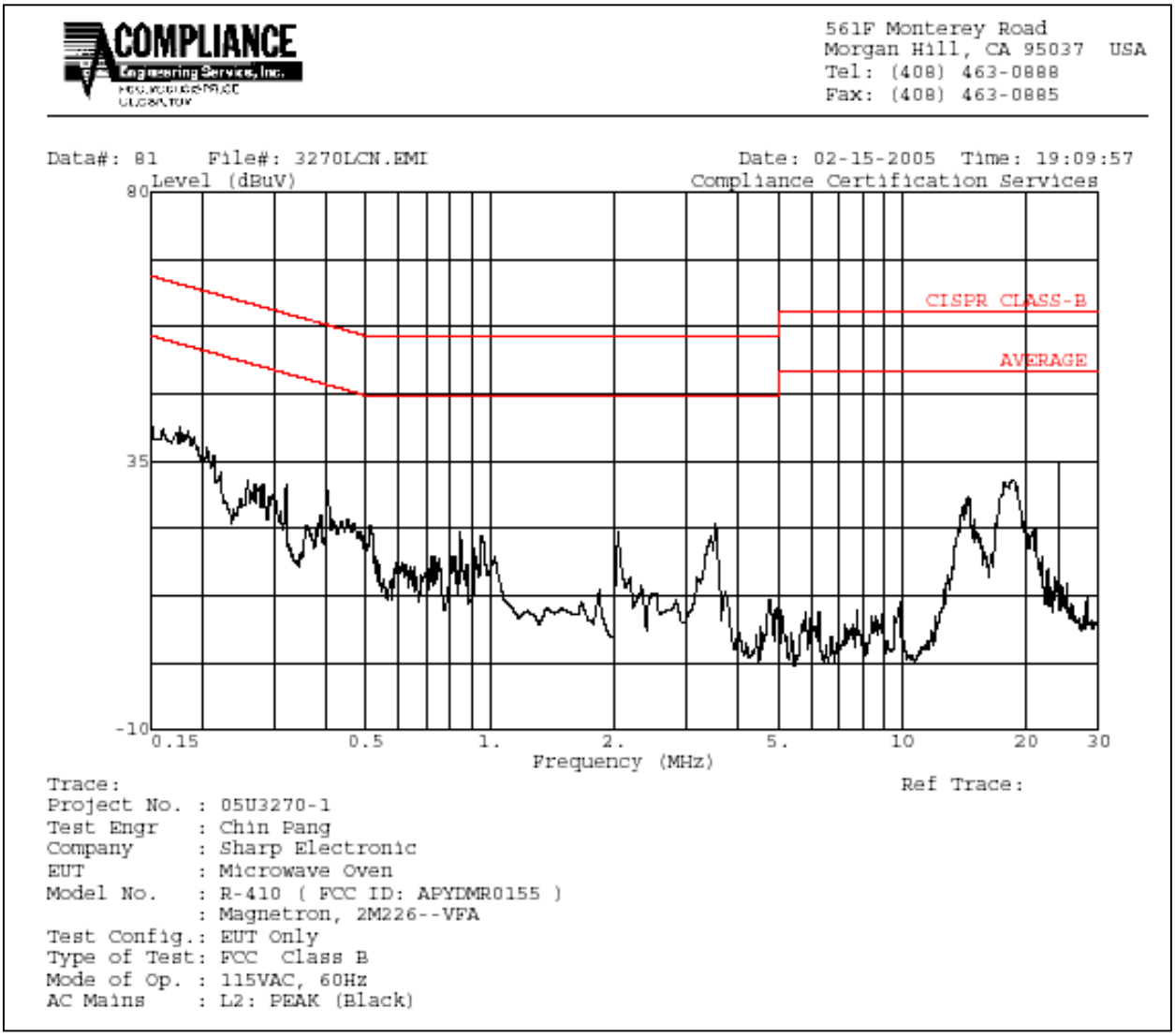
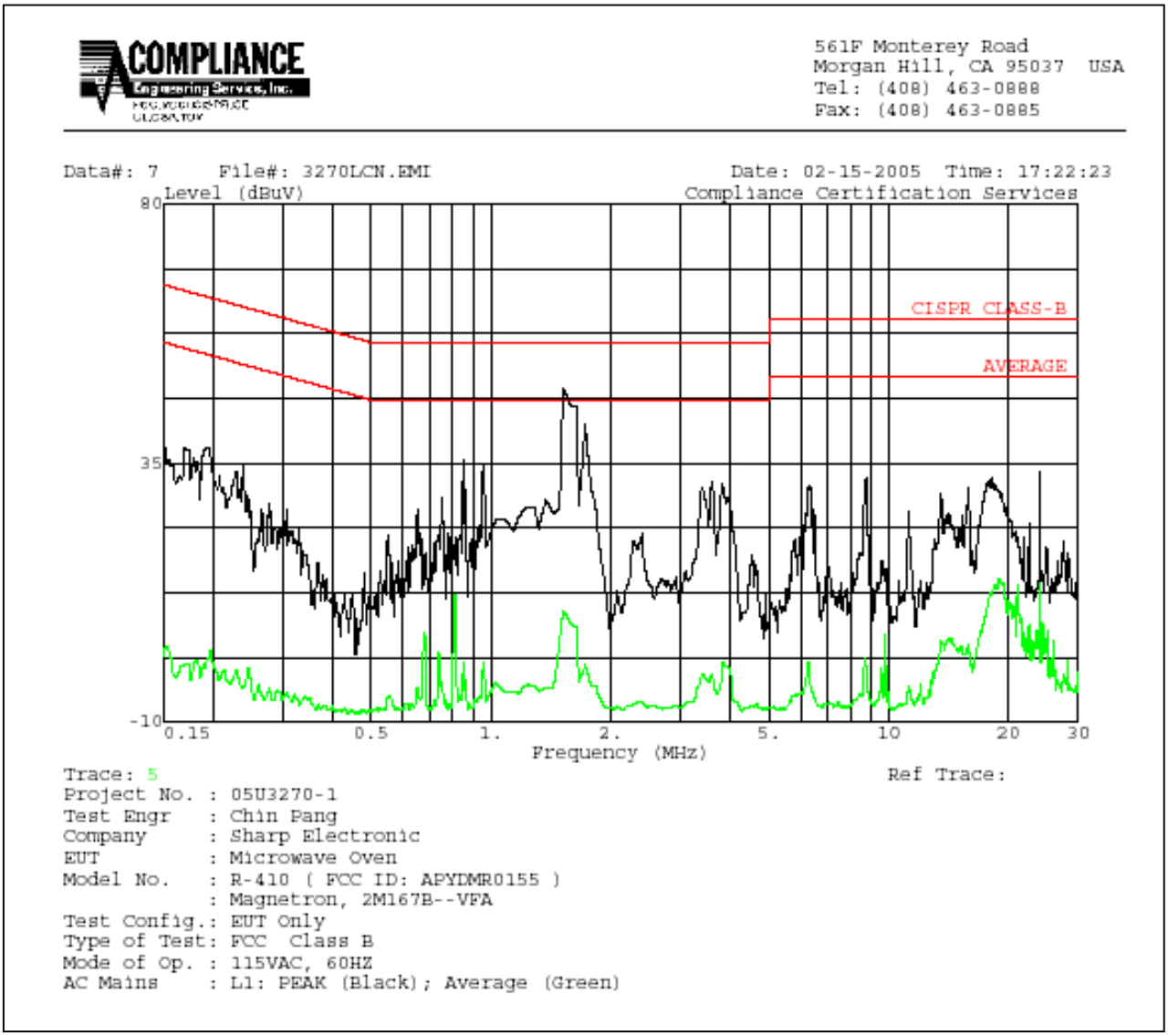


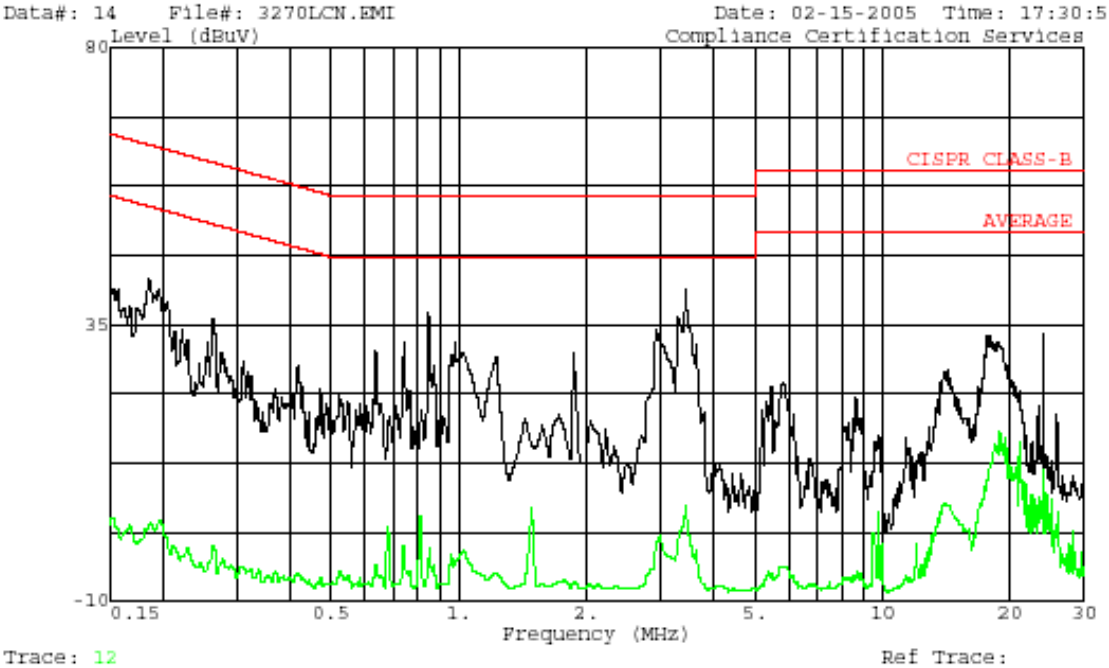
MAGNETRON-2M167B

LINE 1



LINE 2

561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0888
Fax: (408) 463-0885



6. MEASUREMENT EQUIPMENT LIST

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
30MHz---- 2Ghz	Sunol Sciences	JB1 Antenna	A121003	9/22/2005
Quasi-Peak Adaptor	HP	85650A	2811A01155	5/24/2005
SA Display Section 2	HP	85662A	2816A16696	5/24/2005
SA RF Section, 1.5 GHz	HP	85680B	2814A04227	2/22/2005
Preamplifier, 1300MHz	HP	8447D	2944A06833	8/17/2005
Spectrum Analyzer	HP	8565E	647695	10/14/2005
EMI Test Receiver	R & S	ESHS 20	827129/006	10/22/2005
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2005
Site A Line Stabilizer / Conditioner	Tripplite	LC-1800a	A0051681	CNR
Digital Power Analyzer	Valhalla	2111A	NA	4/20/2005
Amplifier 1-26GHz	MITEQ	NSP2600-SP	924342	8/17/2005
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	9/12/2005
Ajustable Power Supply	The Superior Electric Co.	Powerstat	NA	CNR
Microwave Leakage Tester	Simpson	380-2	6-115310	9/28/2005

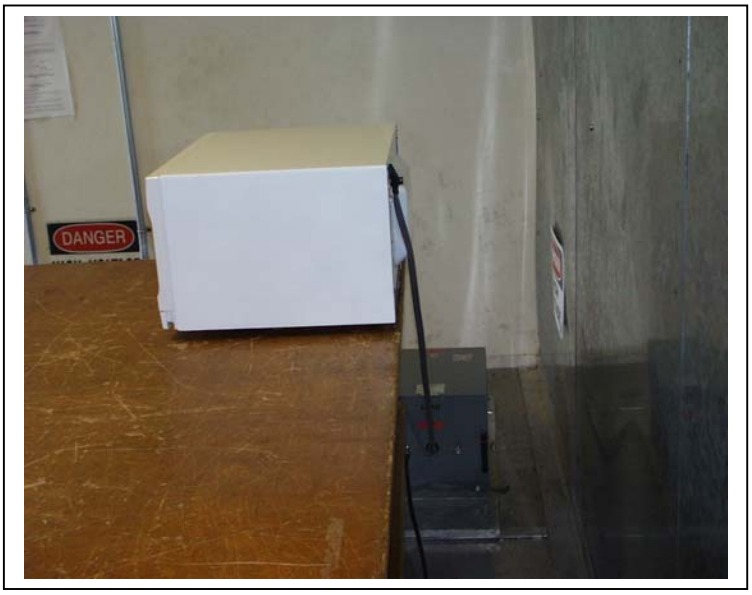
7. EUT SETUP PHOTOS

Radiation Hazard Measurement

Operating Frequency Measurements

Radiation Measurement Below 1GHz

Radiation Measurements Above 1GHz



Line Conduction

END OF REPORT