



**FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENY**

TEST REPORT

FOR

MICROWAVE OVEN

MODEL NUMBER: R-414

MAGNETRON MODEL: 2M246, 2M167B, 2M226, 2M253J(L) -VFU

FCC ID: APYDMR0154

REPORT NUMBER: 05U3271-1

ISSUE DATE: FEBRUARY 17, 2005

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

Prepared by
**COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD,
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888**



LAB CODE:200065-0

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1. VERIFICATION OF COMPLIANCE

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

EUT DESCRIPTION: MICROWAVE OVEN

MODEL NUMBER: R-414

SERIAL NUMBER: 188731

MAGNETRON MODEL: 2M246, 2M167B, 2M226, 2M253J(L) – (VFU)

DATE TESTED: FEBUARY 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 By



THU CHAN / EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By



CHIN PANG / EMC TECHNICIAN
COMPLIANCE CERTIFICATION

2. PRODUCT DESCRIPTION

The equipment under test is a microwave oven sold for consumer use. Model: R-414 is a 1200W microwave oven with digital controls panel.

Magnetron Model: 2M167B, 2M246 and 2M253J(L)--VBA

3. TEST FACILITY

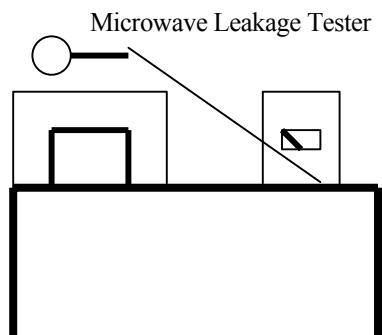
The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

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))

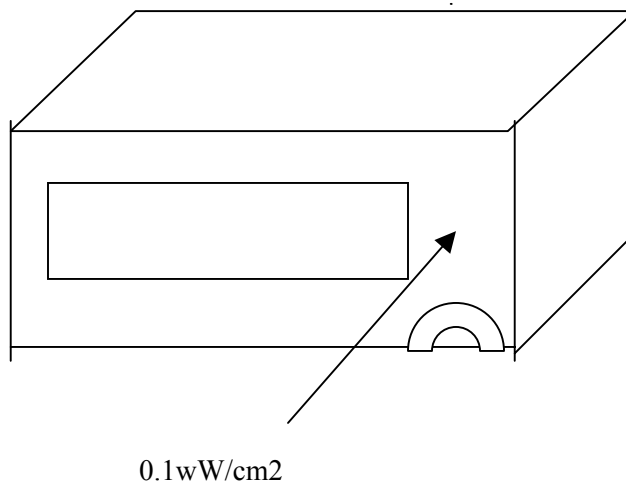
5. RADIO NOISE EMISSION MEASUREMENTS

5.1. RADIATION HAZARD MEASUREMENT



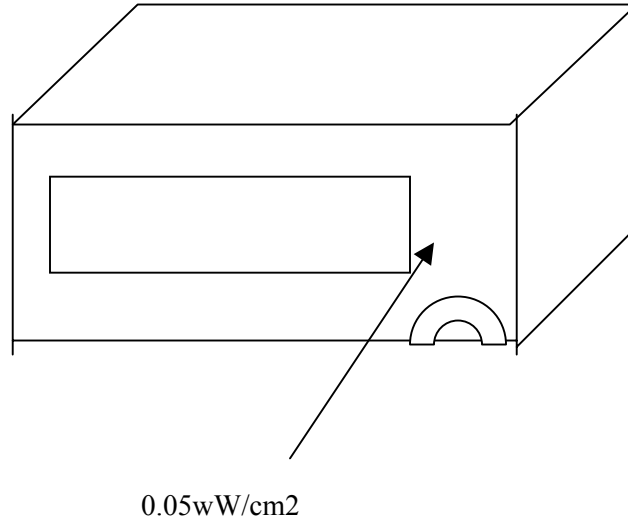
A 700-ml water load was placed in the center of the oven. The power setting was set to 10 (100) maximum power. While the oven was operating, the STE probe was moved slowly around the door seams to check for leakage.

5.1.1. MAGNETRON-2M246



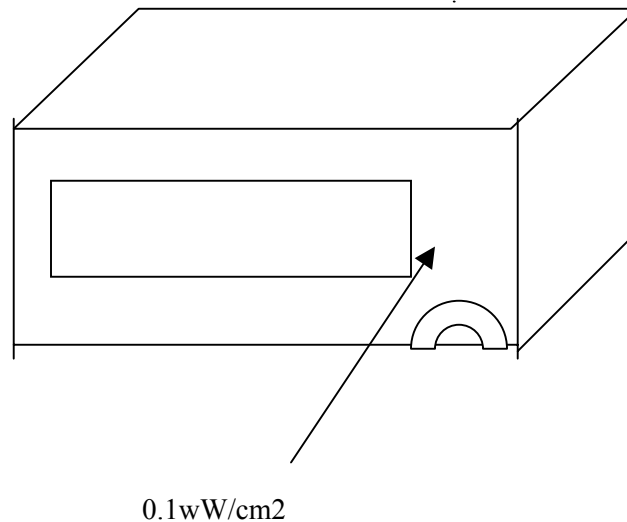
	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	0.1	1.00
All Others	0.05	1.00

5.1.2. MAGNETRON-2M167B



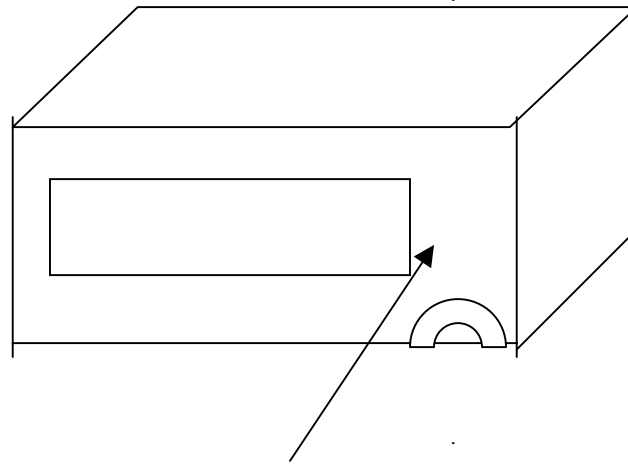
	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	0.05	1.00
All Others	0.02	1.00

5.1.3. MAGNETRON-2M226



	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	0.1	1.00
All Others	0.02	1.00

5.1.4. MAGNETRON-2M253J(L)



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

5.2. 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 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.

5.2.1. MAGNETRON-2M246B

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	14.90	1713.5

5.2.2. MAGNETRON-2M167B

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	15.0	1725

5.2.3. MAGNETRON-2M226

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
115	15.5	1767

5.2.4. MAGNETRON - 2M253J(L)

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

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)
19.5	39.6	120	703.5
18.0	38.2	120	707
18.0	38.5	120	717.5

Average of 3 Trials: 709.3W

5.3.2. MAGNETRON-2M167B

Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
18.1	40.2	120	773.5
18.3	40.4	120	773.5
18.7	40.7	120	770

Average of 3 Trials : 772.3 W

5.3.3. MAGNETRON-2M226

Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
18	39.6	120	756
18.3	40	120	759.5
18.5	40.5	120	770

Average of 3 Trials: 761.8 W

5.3.4. MAGNETRON - 2M253J(L)

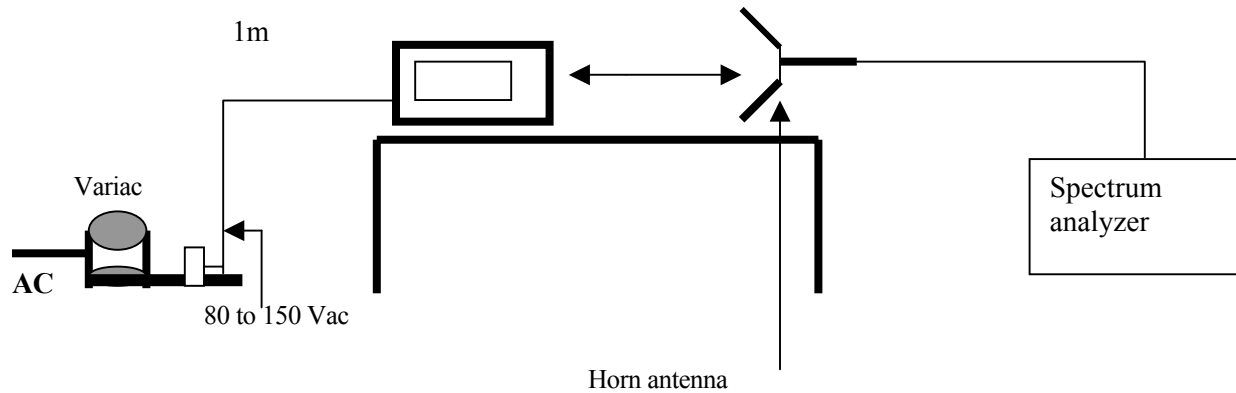
Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
19.4	41.3	120	761.5
19.9	42.0	120	773.5
21.1	42.3	120	777

Average of 3 Trials: 770 W

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

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 $25 \sqrt{\text{Power}/500}$ @ 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.

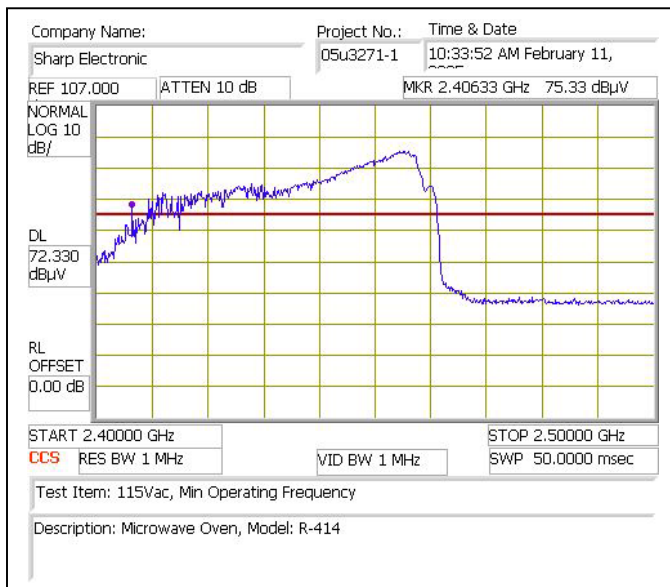
The results of this test are as follows.

Initial load: 1000 ml

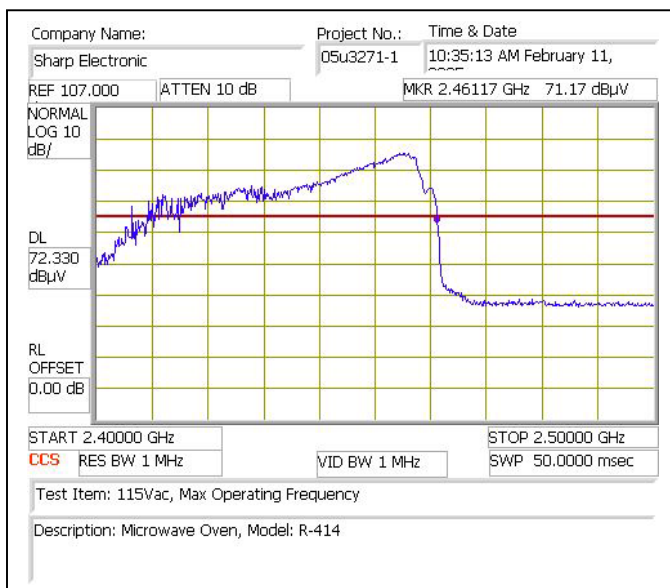
Load at completion of test: 200 ml

5.5.1. MAGNETRON-2M246

	115Vac(MHz)
Minimum Frequency (2400 MHz)	2406.33
Maximum Frequency (2500 MHz)	2461.17



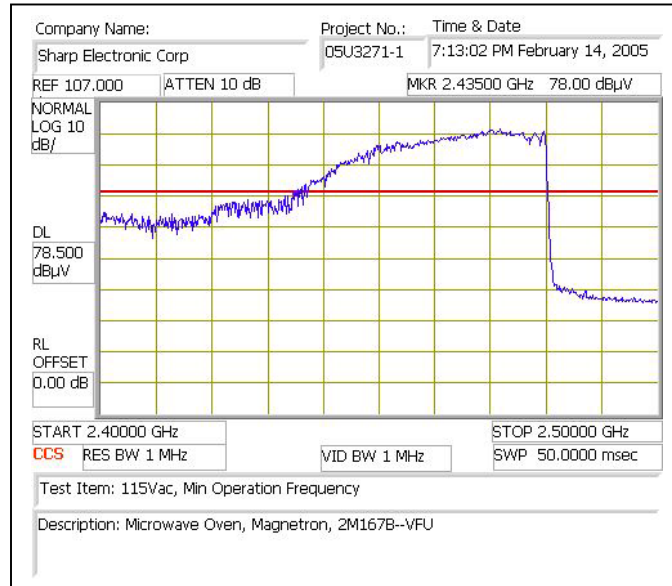
Minimum Frequency @ 115Vac



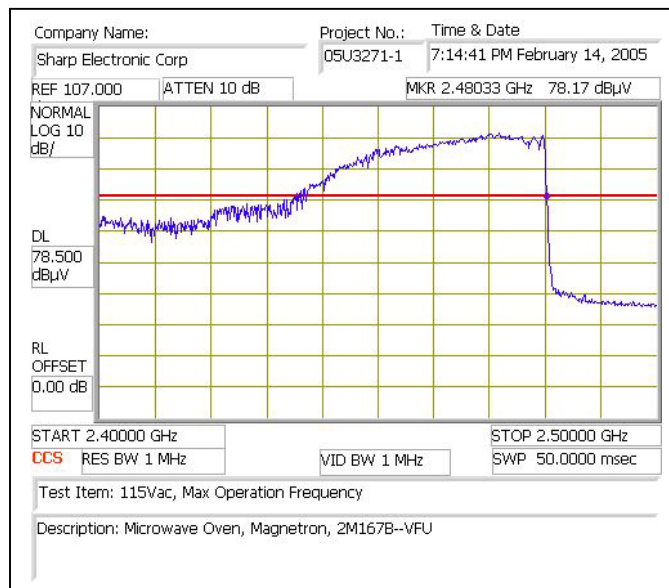
Maximum Frequency @ 115Vac

5.5.2. MAGNETRON-2M167B

	115Vac(MHz)
Minimum Frequency (2400 MHz)	2435
Maximum Frequency (2500 MHz)	2480.33



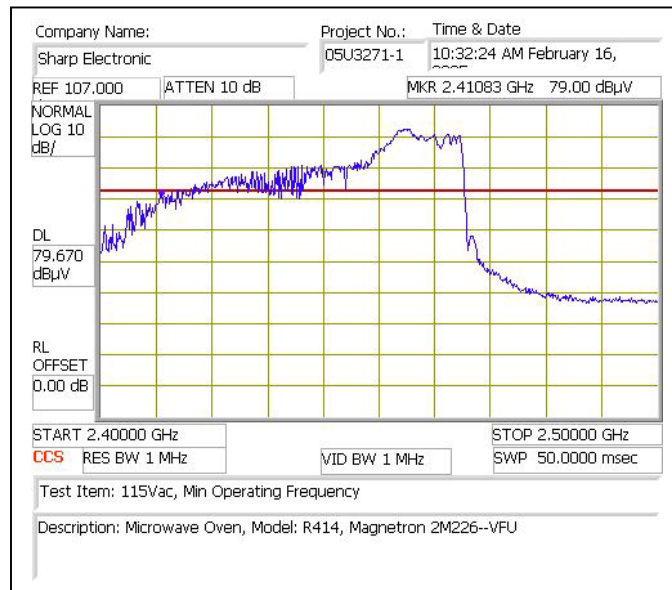
Minimum Frequency @ 115Vac



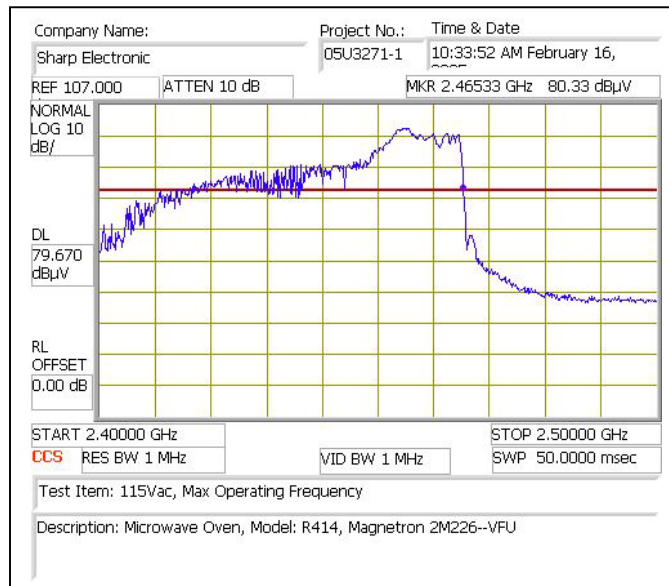
Maximum Frequency @ 115Vac

5.5.3. MAGNETRON-2M226

	115Vac(MHz)
Minimum Frequency (2400 MHz)	2410.83
Maximum Frequency (2500 MHz)	2465.33



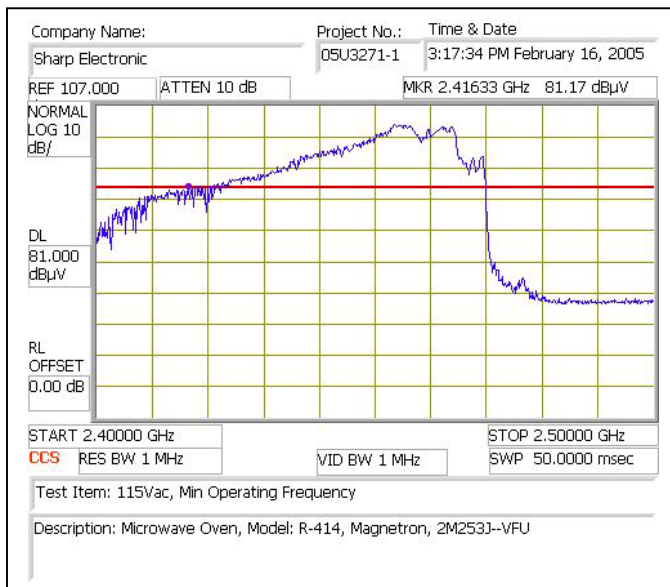
Minimum Frequency @ 115Vac



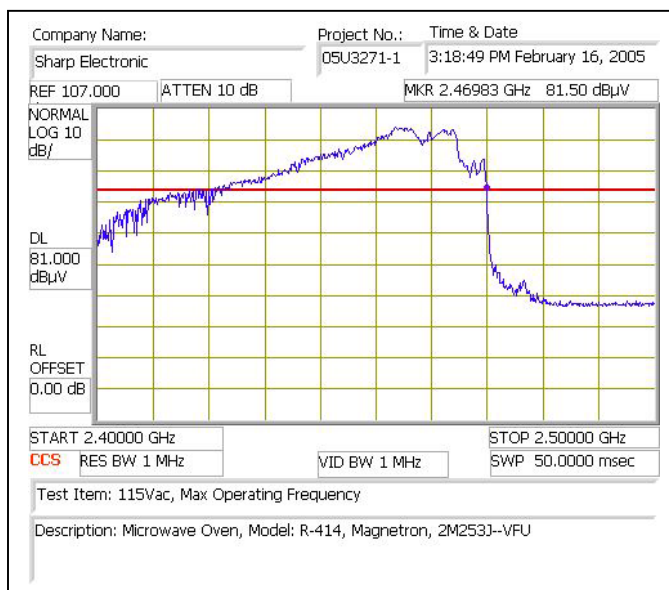
Maximum Frequency @ 115Vac

5.5.4. MAGNETRON-2M253J(L)

	115Vac(MHz)
Minimum Frequency (2400 MHz)	2416.33
Maximum Frequency (2500 MHz)	2469.83



Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac

5.6. VARIATION IN OPERATING FREQUENCY WITH VOLTAGE

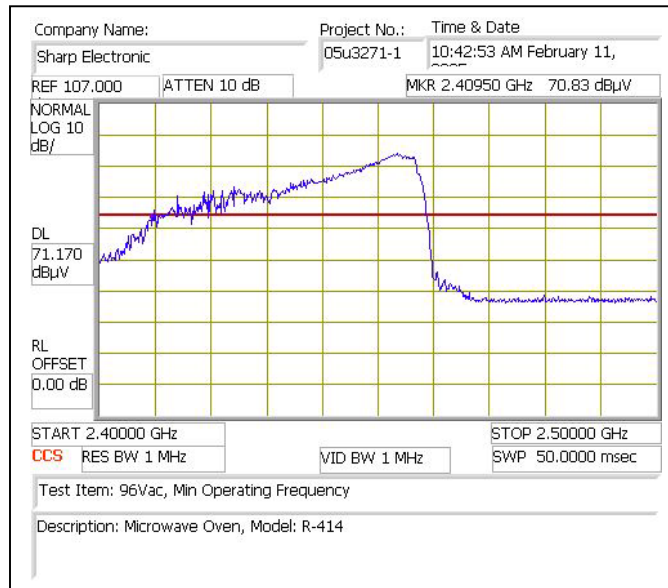
Following the above test, after operating the oven long enough to assure that stable operating temperature were obtained, the operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating.

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

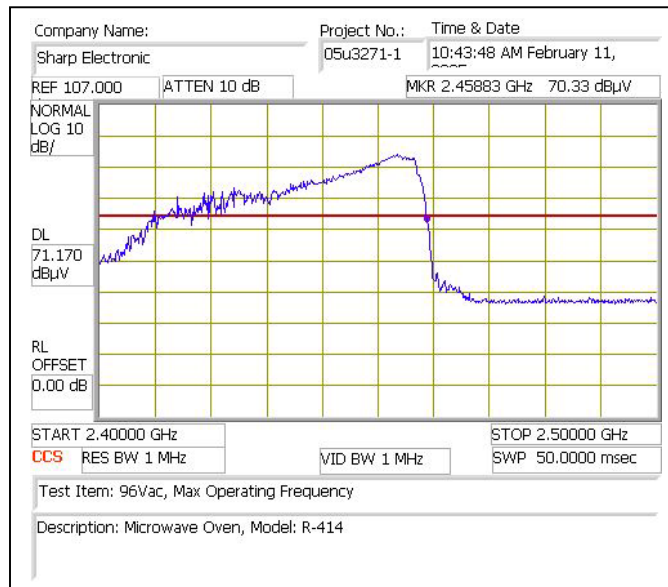
The results of this test are as follows:

5.6.1. MAGNETRON-2M246

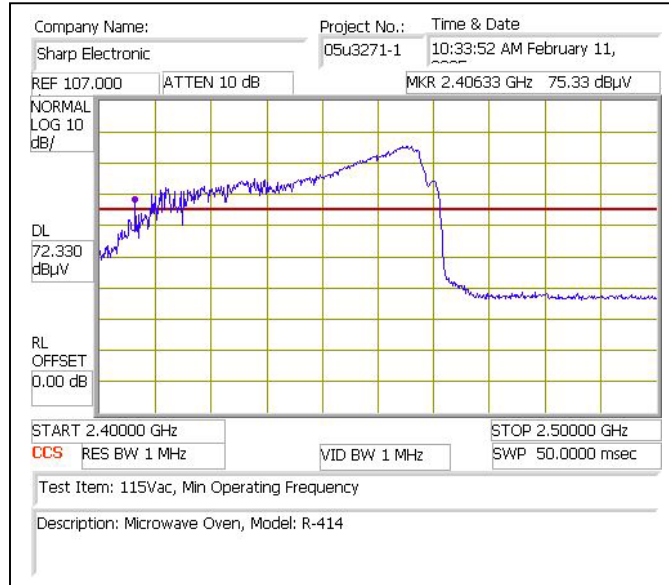
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	2409.50	2406.33	2412
Maximum Frequency (2500 MHz)	2458.83	2461.17	2458.83



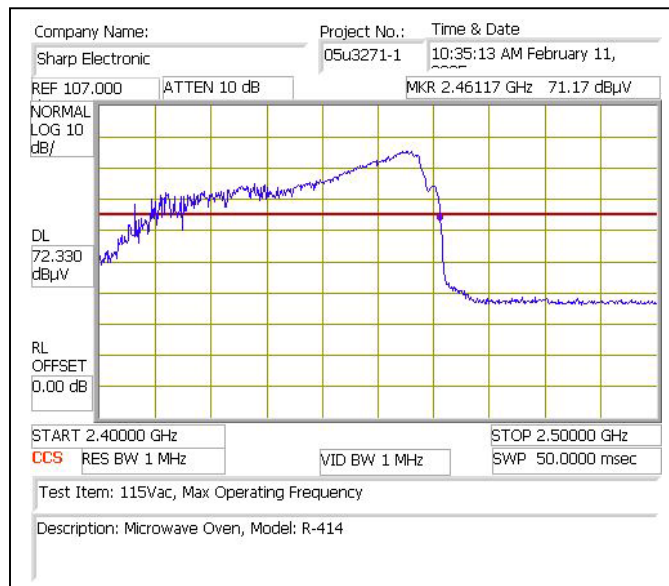
Minimum Frequency @ 96Vac



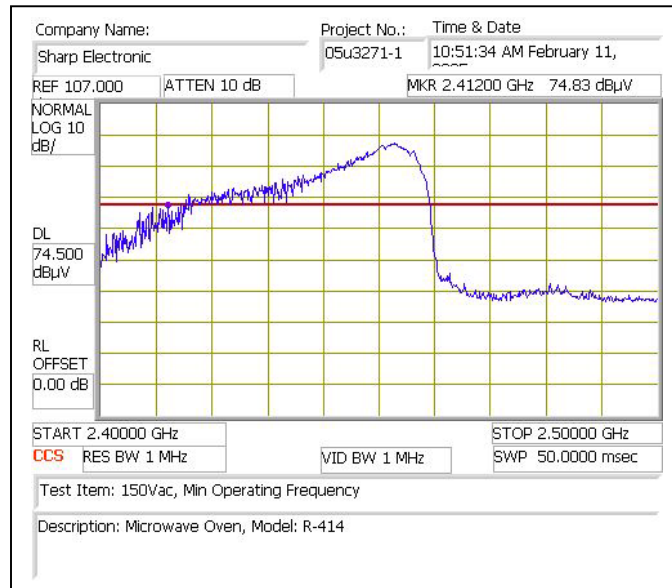
Maximum Frequency @ 96Vac



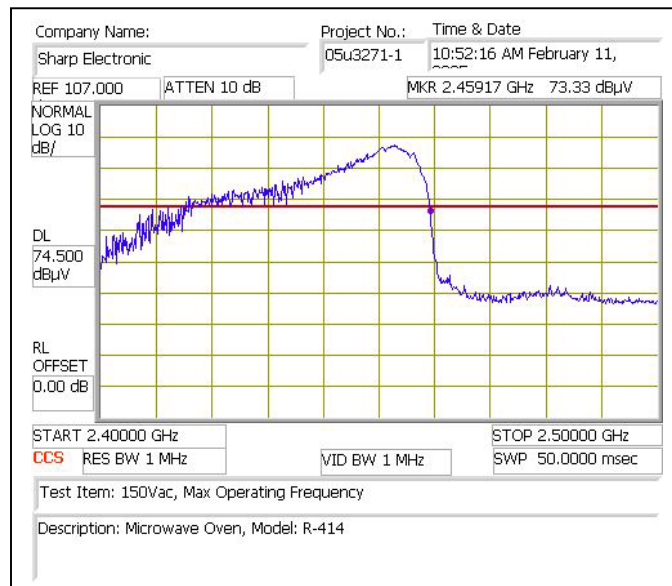
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



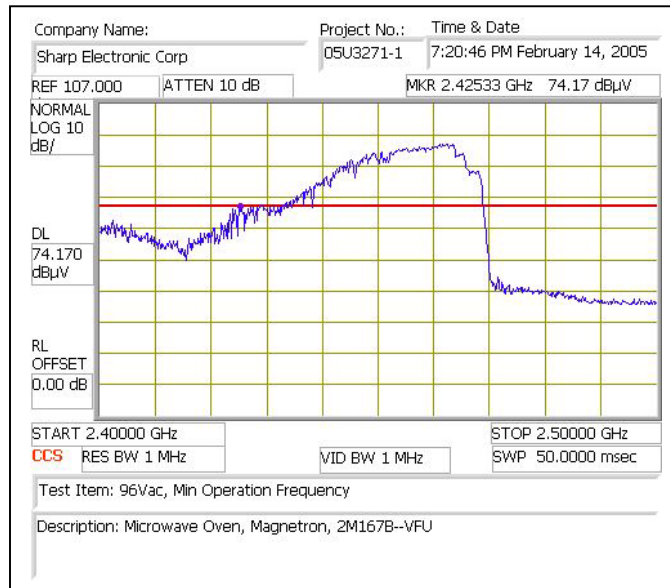
Minimum Frequency @ 150Vac



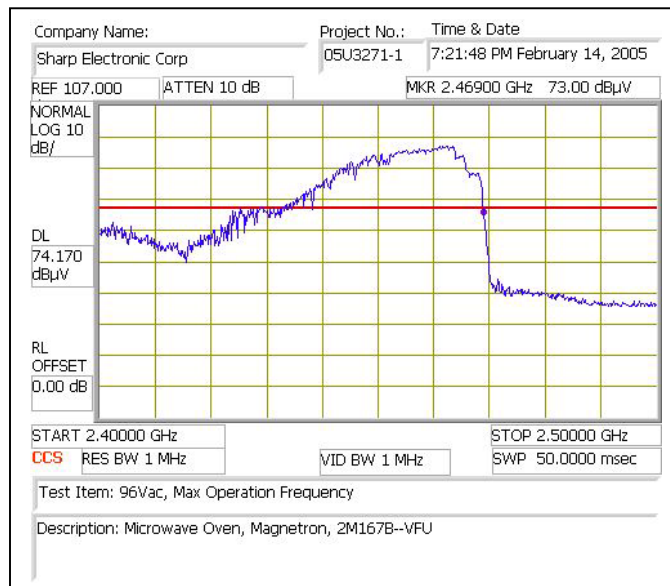
Maximum Frequency @ 150Vac

5.6.2. MAGNETRON-2M167B

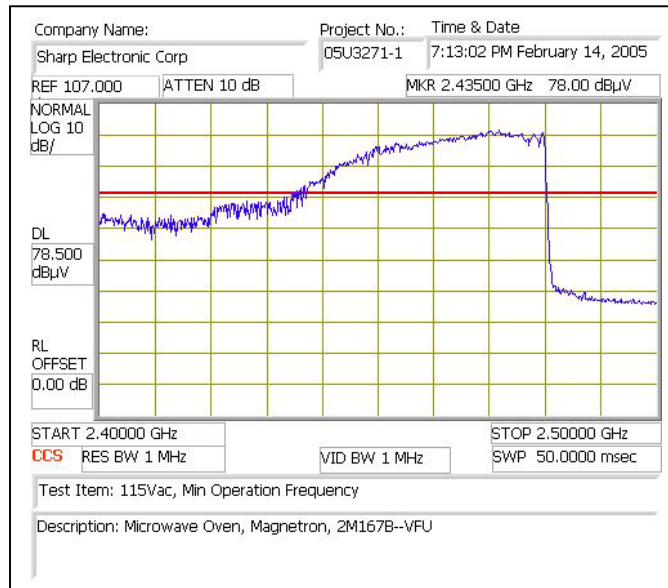
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	2425.33	2435	2432.83
Maximum Frequency (2500 MHz)	24694	2480.33	2474.67



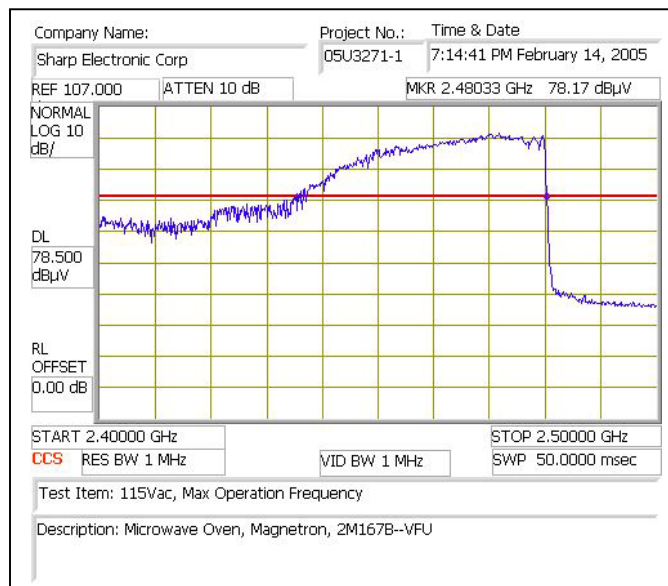
Minimum Frequency @ 96Vac



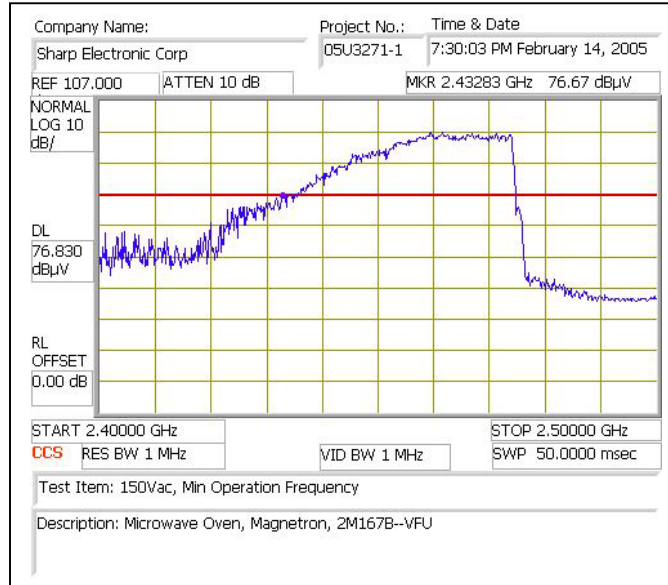
Maximum Frequency @ 96Vac



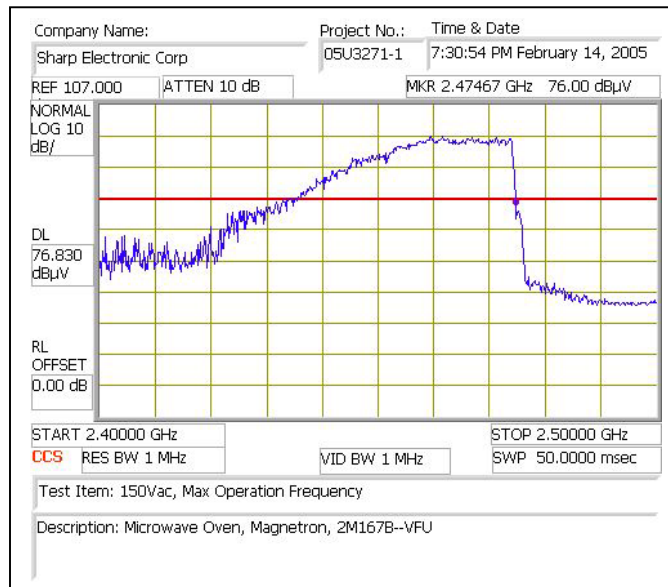
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



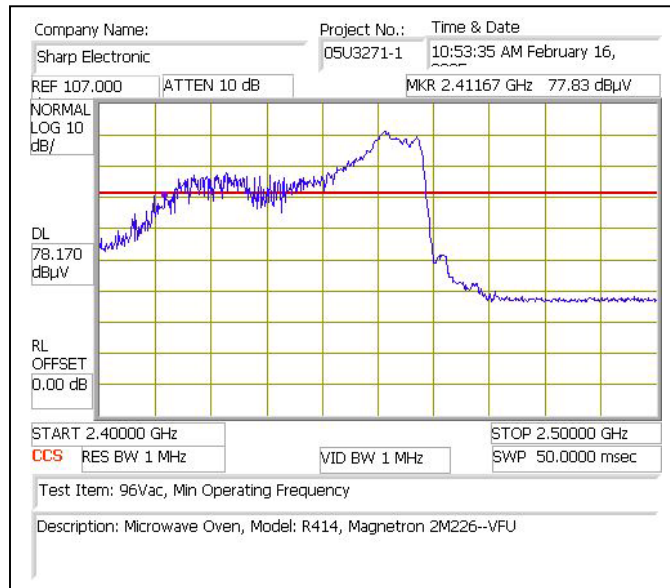
Minimum Frequency @ 150Vac



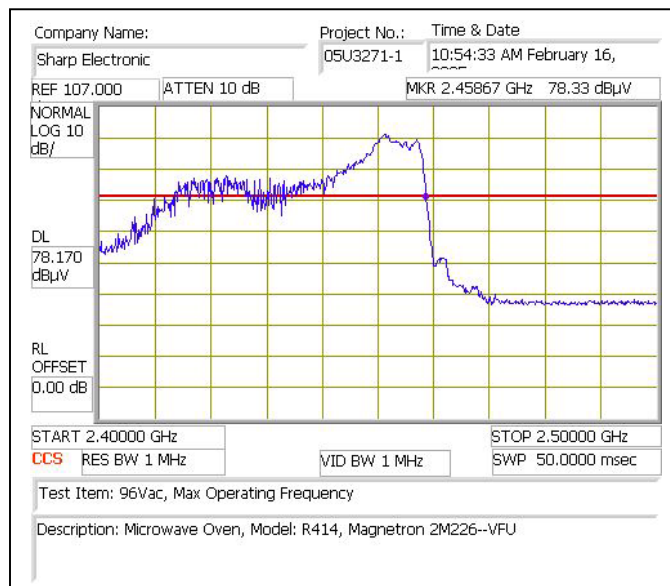
Maximum Frequency @ 150Vac

5.6.3. MAGNETRON-2M226

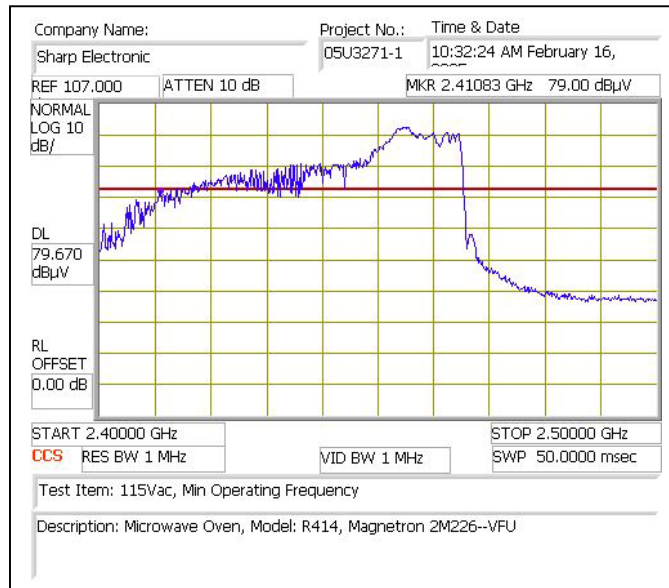
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	2411.67	2410.83	2405.50
Maximum Frequency (2500 MHz)	2458.67	2465.33	2466



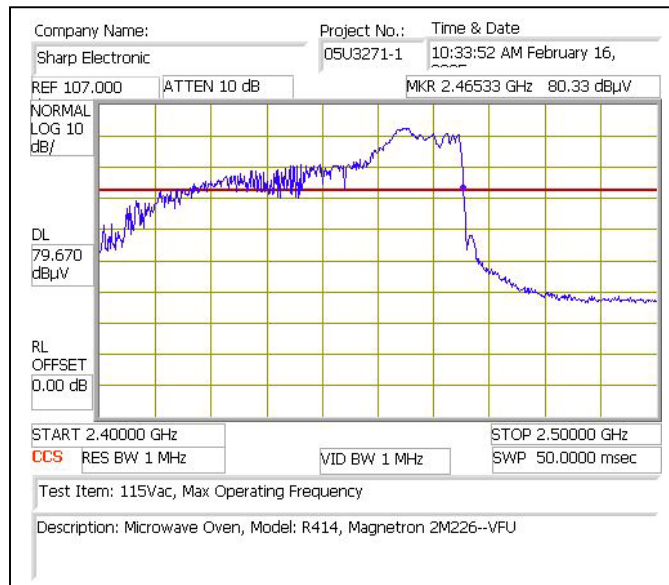
Minimum Frequency @ 96Vac



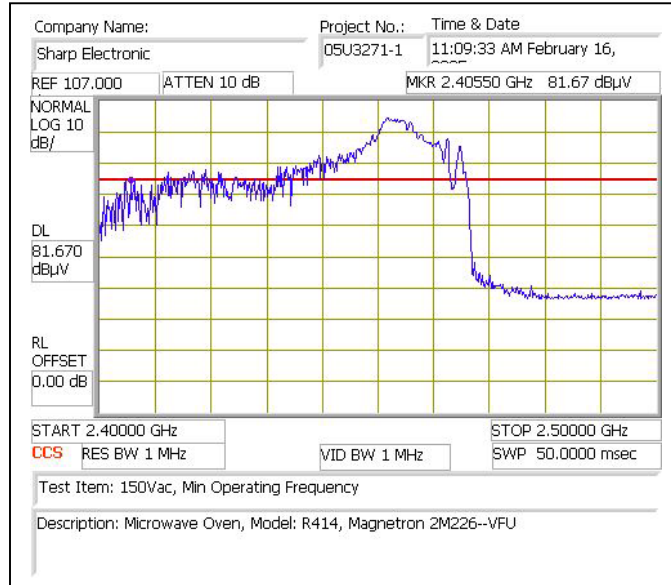
Maximum Frequency @ 96Vac



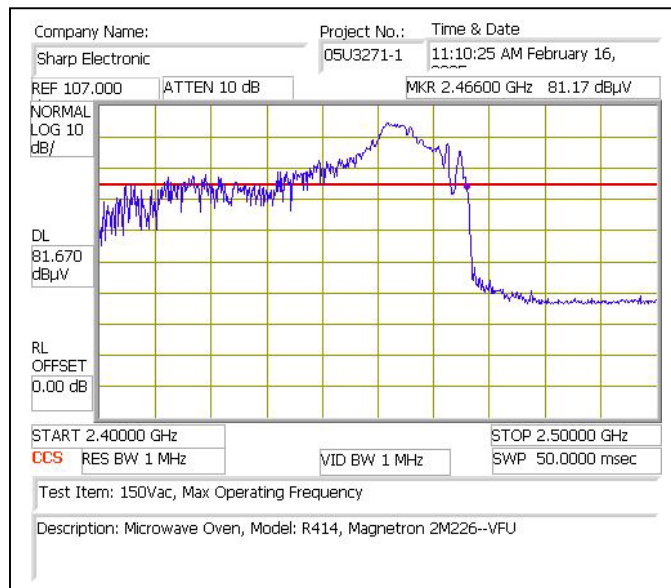
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



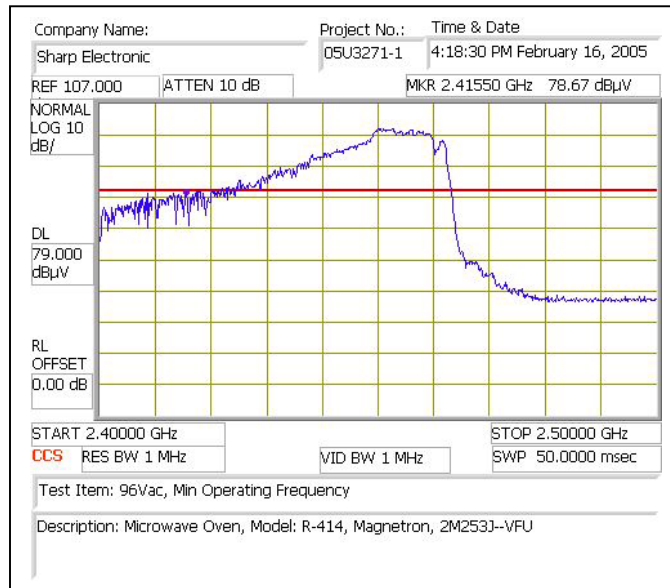
Minimum Frequency @ 150Vac



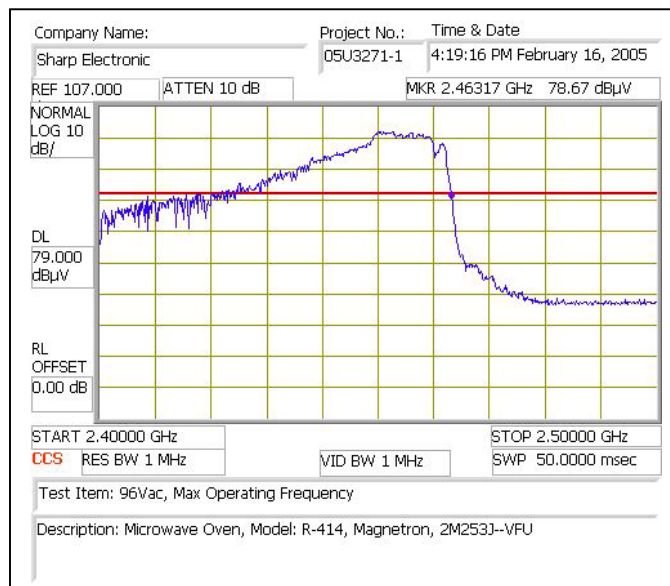
Maximum Frequency @ 150Vac

5.6.4. MAGNETRON - 2M253J(L)

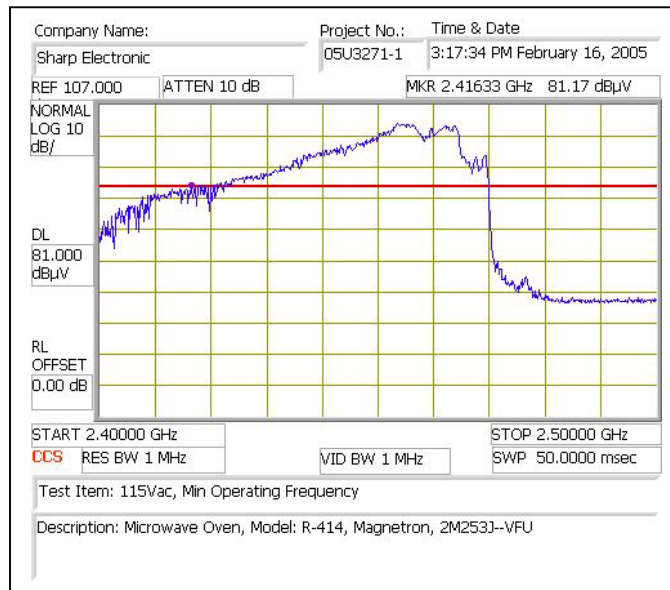
	96Vac (MHz)	115Vac (MHz)	150Vac (MHz)
Minimum Frequency (2400 MHz)	2415.50	2416.33	2416.83
Maximum Frequency (2500 MHz)	2463.17	2469.83	2469.17



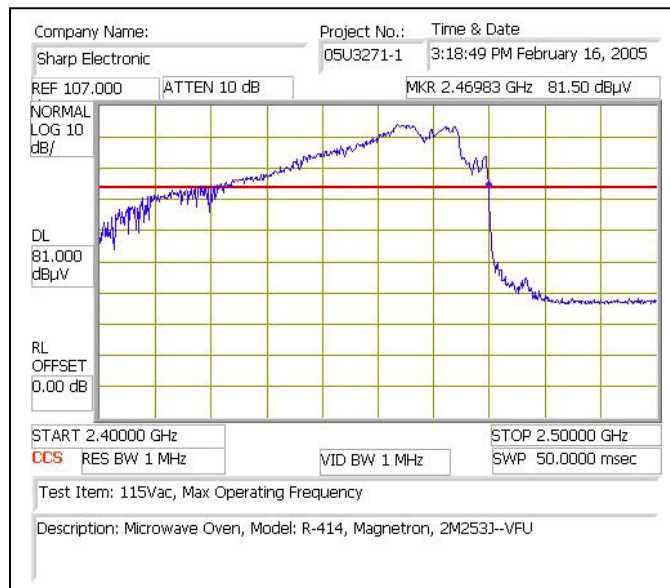
Minimum Frequency @ 96Vac



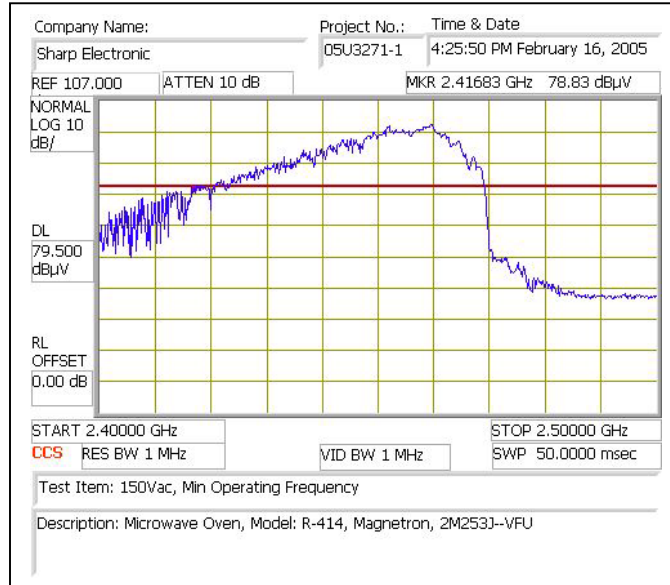
Maximum Frequency @ 96Vac



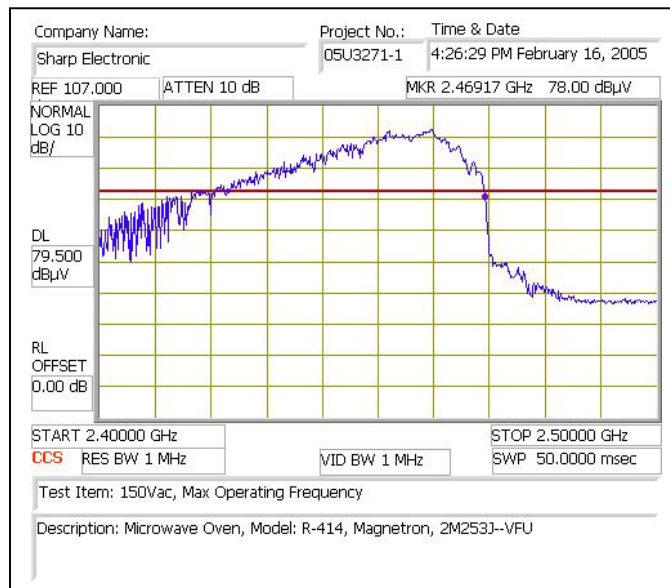
Minimum Frequency @ 115Vac



Maximum Frequency @ 115Vac



Minimum Frequency @ 150Vac



Maximum Frequency @ 150Vac

5.7. RADIATED EMISSIONS

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.

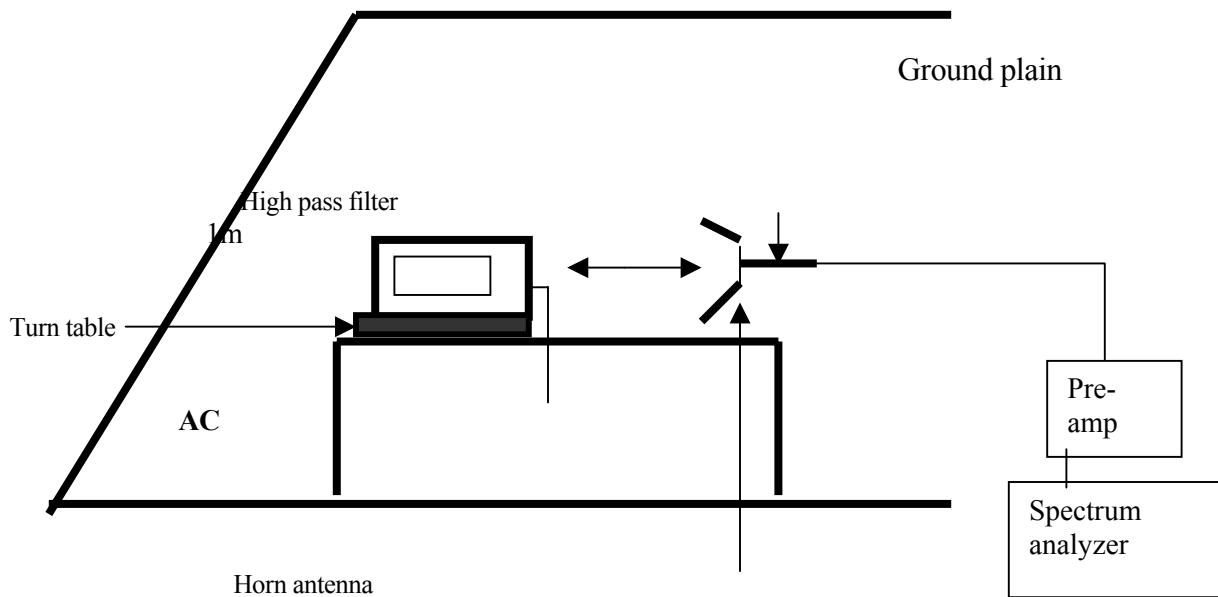
During the preliminary tests, the load consisted of 700-ml tap water placed in the center of the oven. The emissions were observed while the device under test was operated at maximum output power.

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.

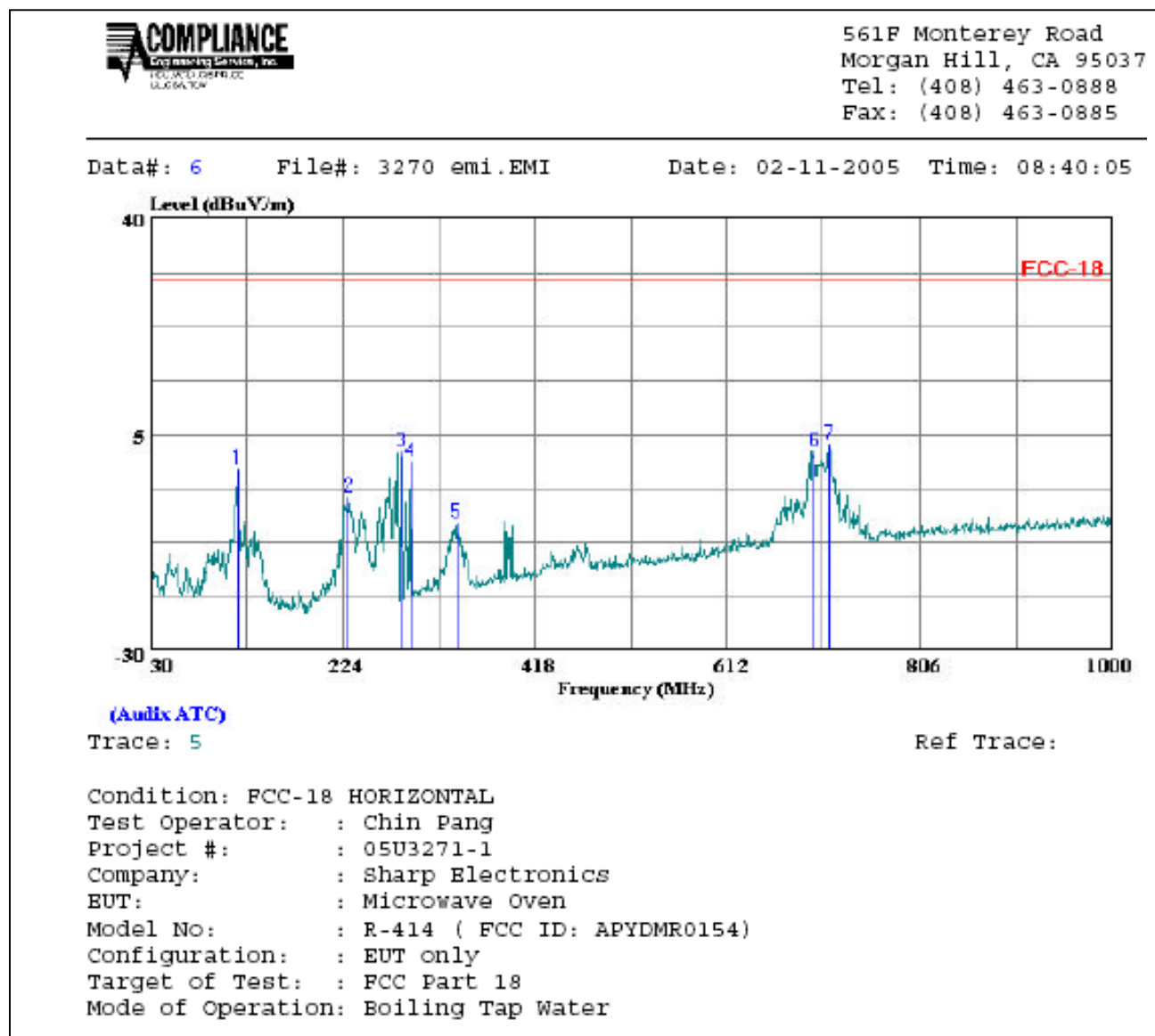
The maximum of all other out-of-band emissions were measured while a 700-ml load was placed in the center of the oven. Maximum readings were recorded after variations in antenna polarizations, height, device orientation, load position, and size. For frequencies above 1 GHz, the video bandwidth of the 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

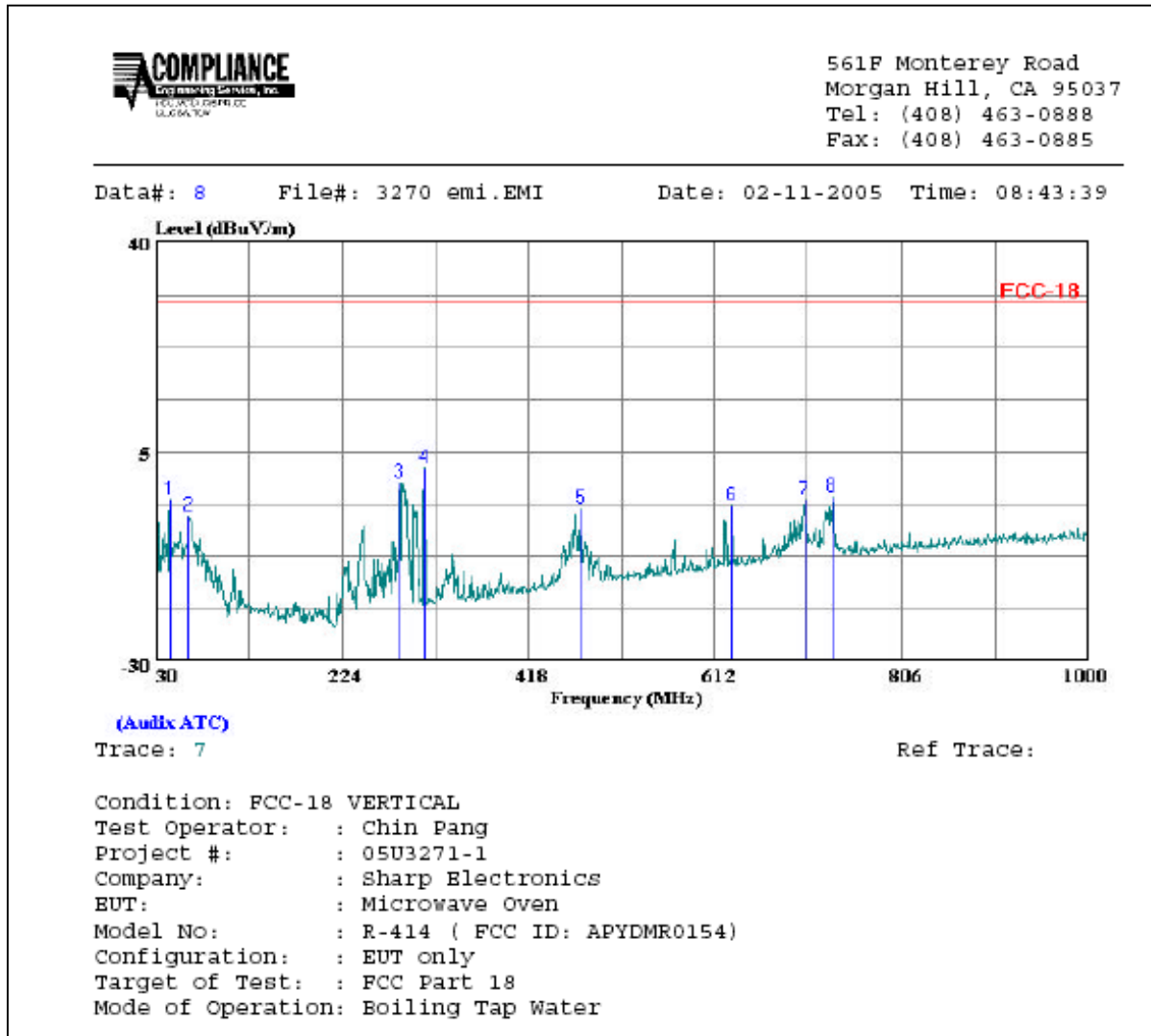
5.7.1. MAGNETRON-2M246 (HORIZONTAL)



HORIZONTAL DATA,

Page: 1							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	118.270	12.30	-12.90	-0.60	30.00	-30.60	Peak
2	229.820	9.20	-14.59	-5.39	30.00	-35.39	Peak
3	284.140	14.80	-12.50	2.30	30.00	-27.70	Peak
4	292.870	12.70	-12.15	0.55	30.00	-29.45	Peak
5	339.430	1.50	-10.90	-9.40	30.00	-39.40	Peak
6	700.270	5.40	-3.24	2.16	30.00	-27.84	Peak
7	715.790	6.50	-2.99	3.51	30.00	-26.49	Peak

5.7.2. MAGNETRON-2M246 (VERTICAL)



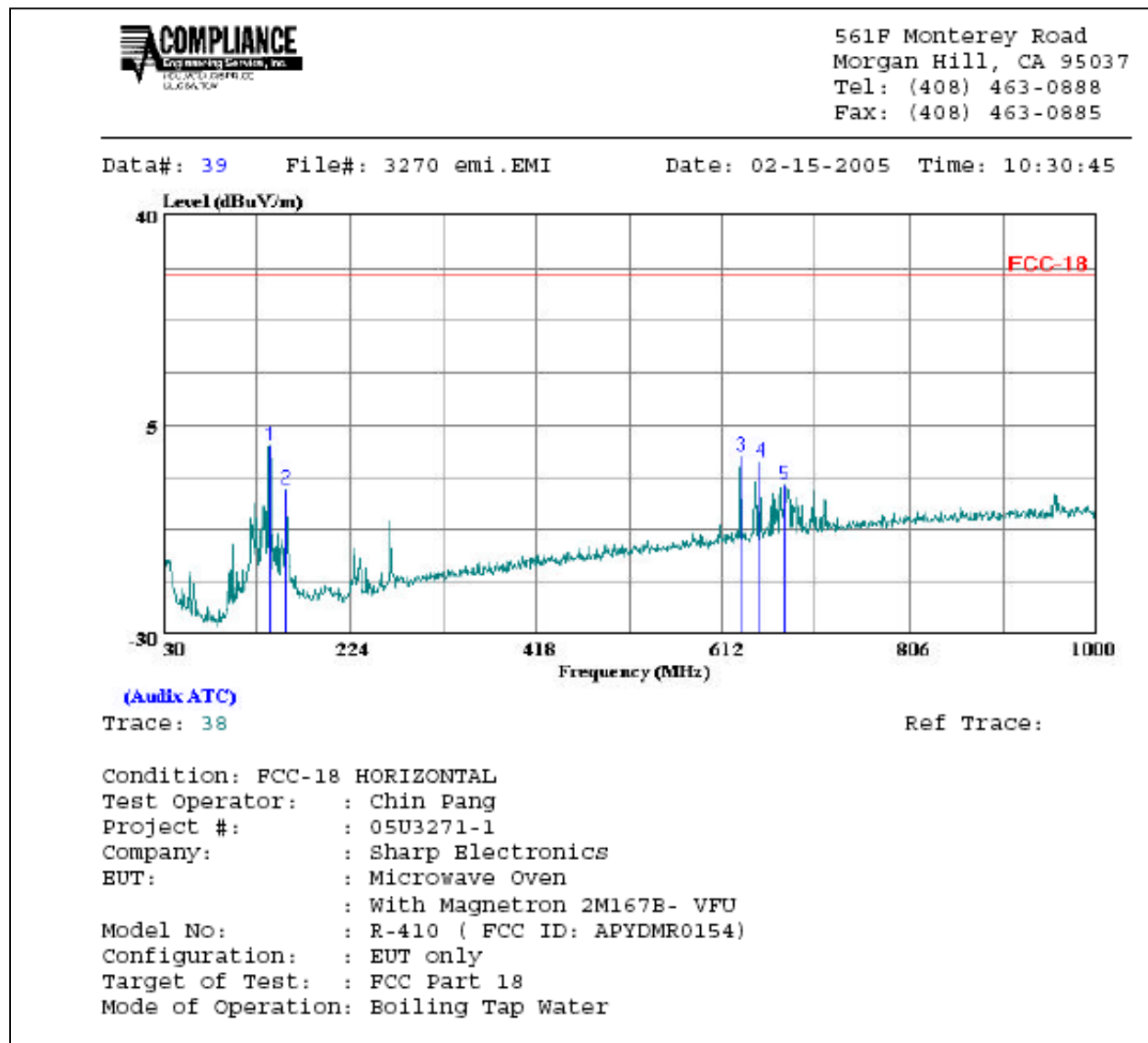
VERTICAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	44.550	12.30	-15.46	-3.16	30.00	-33.16	Peak
2	63.950	13.00	-18.89	-5.89	30.00	-35.89	Peak
3	284.140	12.40	-12.50	-0.10	30.00	-30.10	Peak
4	309.360	13.70	-11.55	2.15	30.00	-27.85	Peak
5	472.320	3.20	-7.81	-4.61	30.00	-34.61	Peak
6	630.430	0.80	-4.77	-3.97	30.00	-33.97	Peak
7	706.090	0.00	-3.18	-3.18	30.00	-33.18	Peak
8	735.190	0.00	-2.64	-2.64	30.00	-32.64	Peak

2

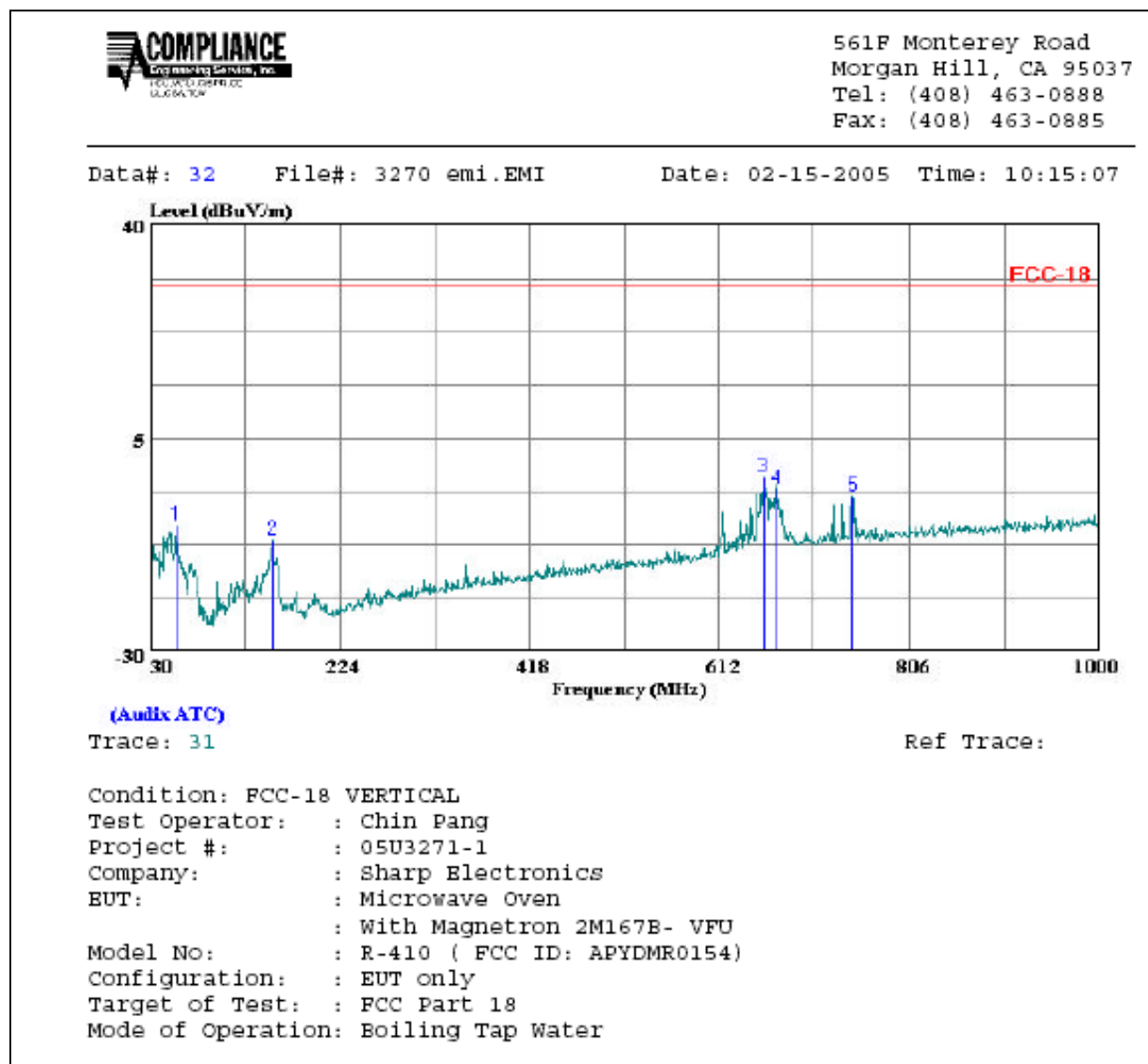
5.7.3. MAGNETRON-2M167B (HORIZONTAL)



HORIZONTAL DATA

Page: 1							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	140.580	14.50	-13.00	1.50	30.00	-28.50	Peak
2	158.040	8.10	-13.87	-5.77	30.00	-35.77	Peak
3	631.400	4.60	-4.75	-0.15	30.00	-30.15	Peak
4	651.770	3.10	-4.28	-1.18	30.00	-31.18	Peak
5	676.990	-1.30	-3.64	-4.94	30.00	-34.94	Peak

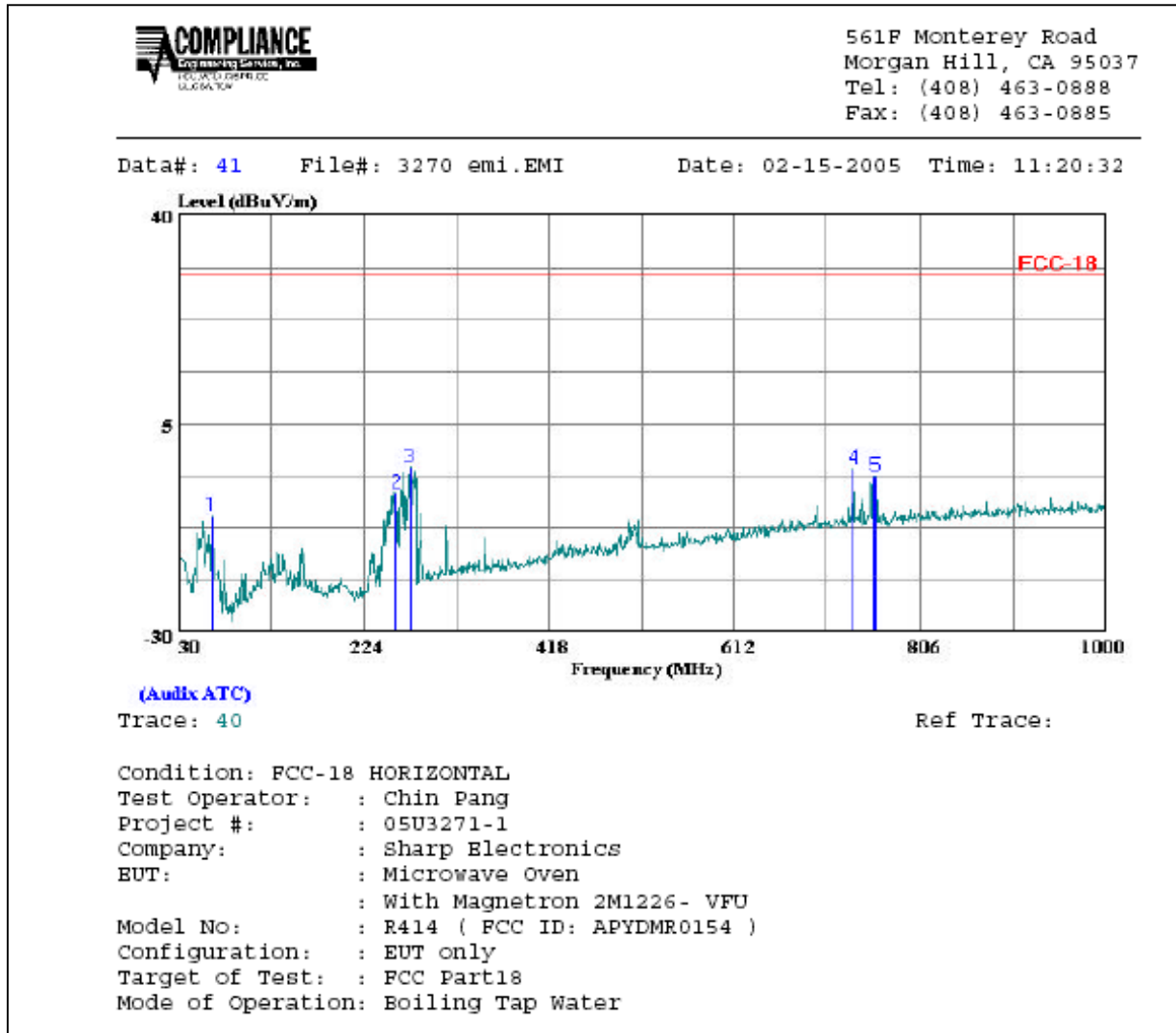
5.7.4. MAGNETRON-2M167B (VERTICAL)



VERTICAL DATA

Page: 1							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	56.190	9.90	-19.39	-9.49	30.00	-39.49	Peak
2	155.130	2.10	-13.81	-11.71	30.00	-41.71	Peak
3	657.590	2.80	-4.13	-1.33	30.00	-31.33	Peak
4	671.170	0.50	-3.75	-3.25	30.00	-33.25	Peak
5	748.770	-2.10	-2.49	-4.59	30.00	-34.59	Peak

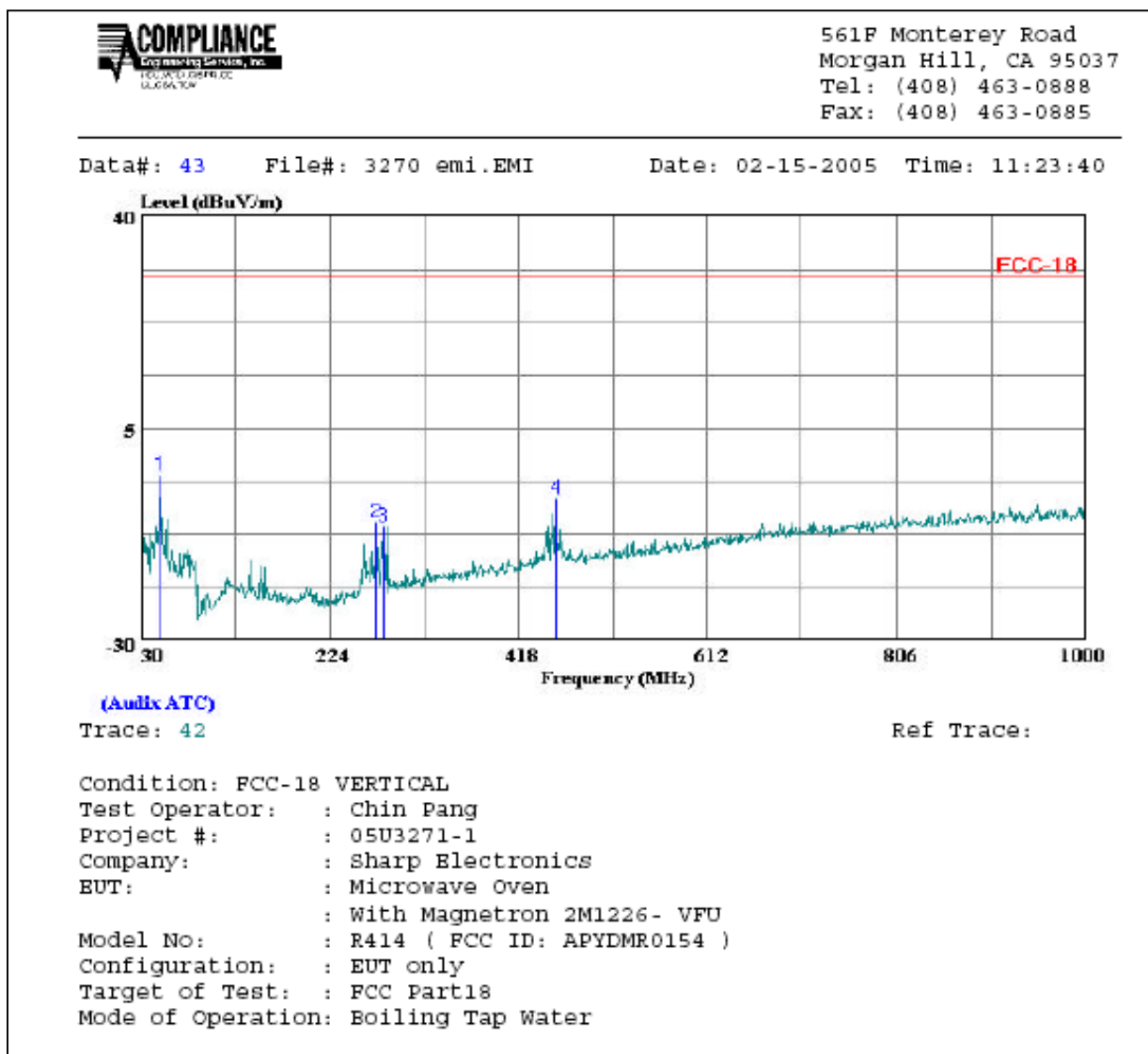
5.7.5. MAGNETRON-2M226 (HORIZONTAL)



HORIZONTAL DATA

							Page: 1
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	64.920	8.30	-18.83	-10.53	30.00	-40.53	Peak
2	257.950	6.70	-13.37	-6.67	30.00	-36.67	Peak
3	272.500	10.40	-12.88	-2.48	30.00	-32.48	Peak
4	737.130	0.00	-2.62	-2.62	30.00	-32.62	Peak
5	759.440	-1.40	-2.43	-3.83	30.00	-33.83	Peak

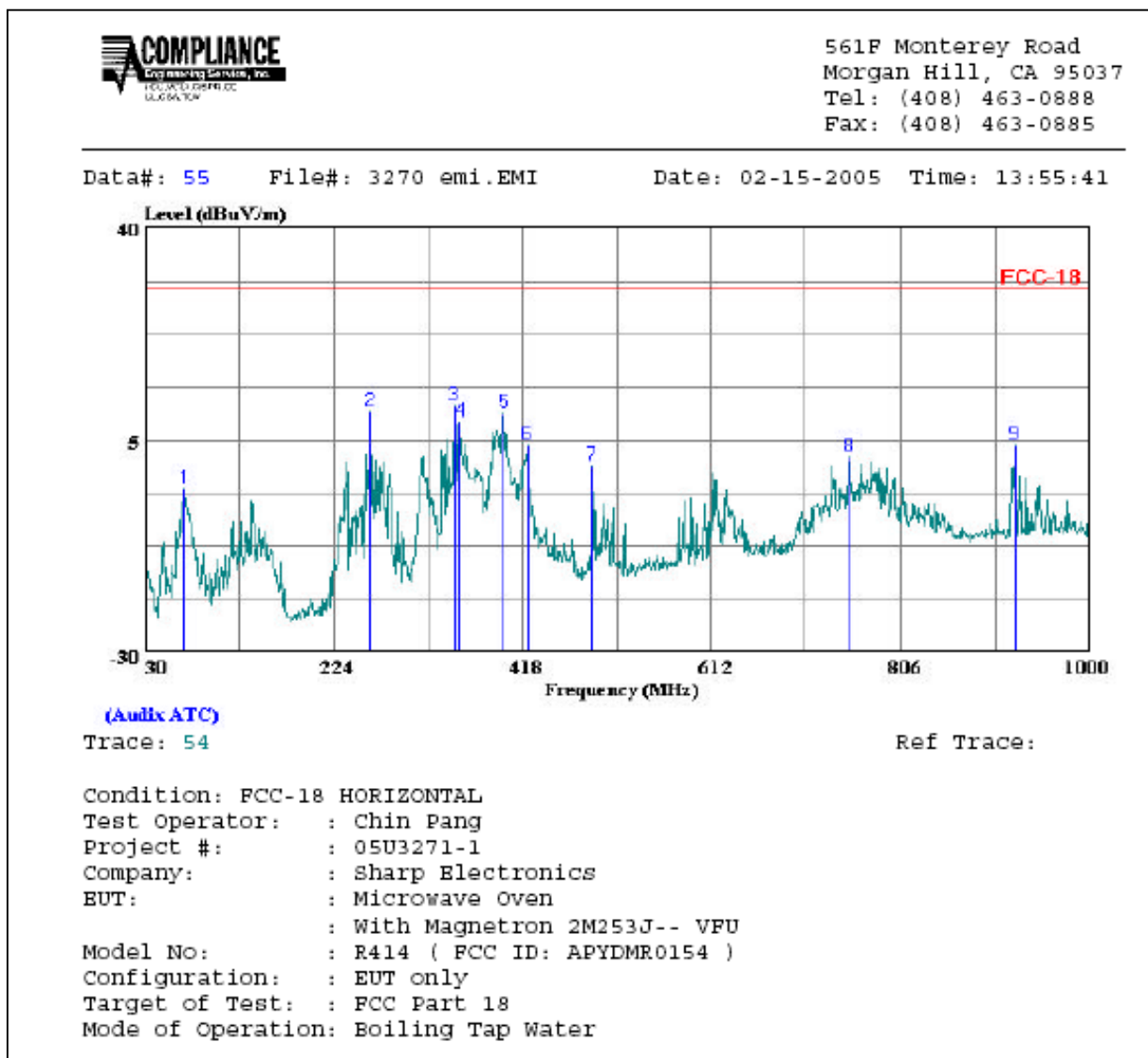
5.7.6. MAGNETRON-2M226 (VERTICAL)



VERTICAL DATA

							Page: 1
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	49.400	15.30	-18.09	-2.79	30.00	-32.79	Peak
2	271.530	2.40	-12.92	-10.52	30.00	-40.52	Peak
3	279.290	1.30	-12.65	-11.35	30.00	-41.35	Peak
4	456.800	1.50	-8.12	-6.62	30.00	-36.62	Peak

5.7.7. MAGNETRON - 2M253J(L) (HORIZONTAL)

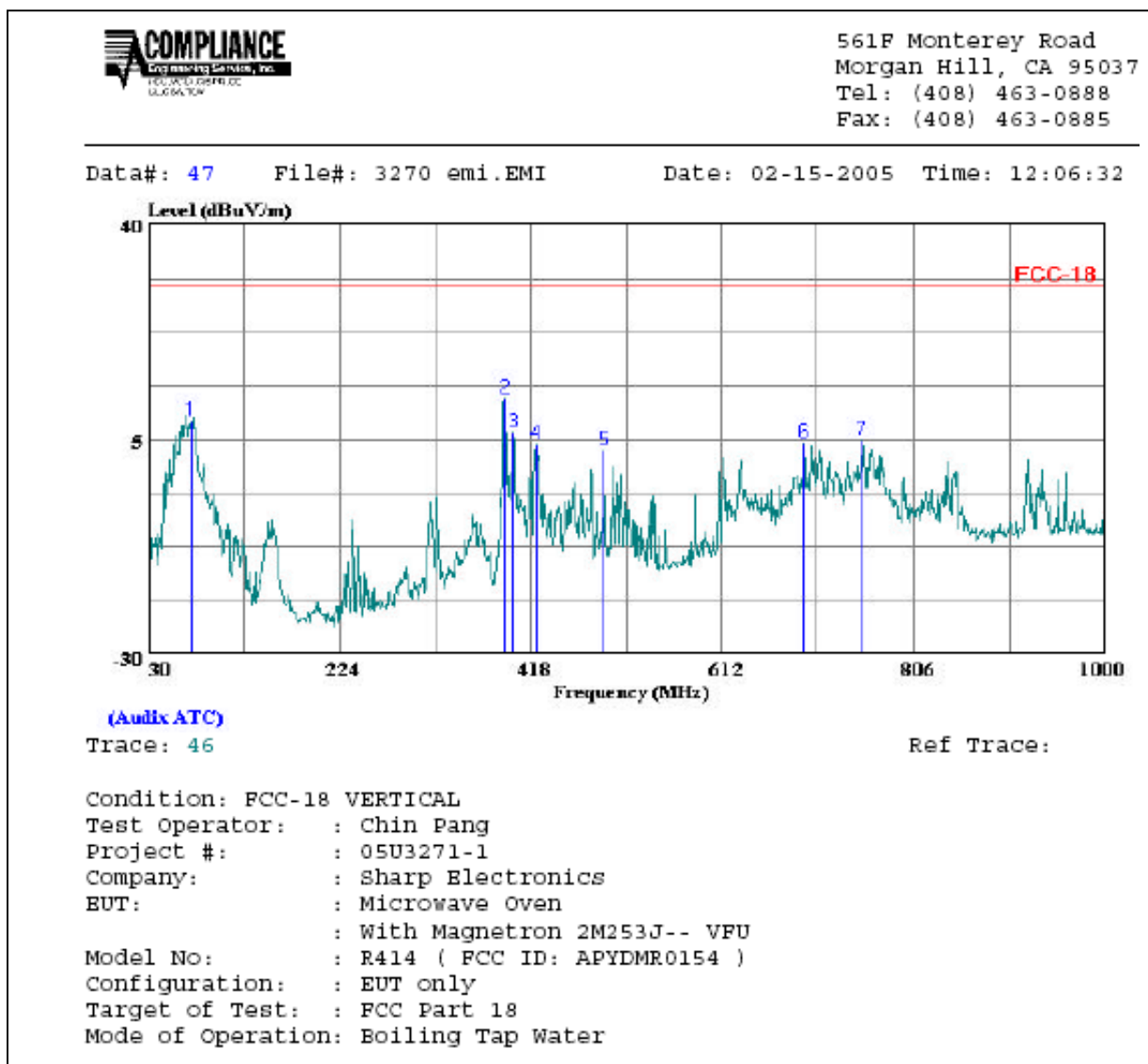


HORIZONTAL DATA

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	70.740	15.40	-18.52	-3.12	30.00	-33.12	Peak
2	261.830	22.90	-13.24	9.67	30.00	-20.34	Peak
3	348.160	21.40	-10.65	10.75	30.00	-19.25	Peak
4	353.980	18.70	-10.58	8.12	30.00	-21.88	Peak
5	398.600	19.00	-9.55	9.45	30.00	-20.55	Peak
6	422.850	13.10	-8.92	4.18	30.00	-25.82	Peak
7	489.780	8.20	-7.44	0.76	30.00	-29.24	Peak
8	754.590	4.60	-2.45	2.15	30.00	-27.85	Peak

5.7.8. MAGNETRON - 2M253J(L) (VERTICAL)



VERTICAL DATA

Page: 1							
	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	72.680	26.60	-18.61	7.99	30.00	-22.01	Peak
2	391.810	21.50	-9.71	11.79	30.00	-18.21	Peak
3	400.540	15.70	-9.54	6.16	30.00	-23.84	Peak
4	422.850	13.00	-8.92	4.08	30.00	-25.92	Peak
5	492.690	10.60	-7.38	3.22	30.00	-26.78	Peak
6	695.420	7.80	-3.31	4.49	30.00	-25.51	Peak
7	754.590	7.40	-2.45	4.95	30.00	-25.05	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 #:05U3271-1																																													
Company:Sharp Electronic Corp.																																													
EUT Descip.:Microwave Oven																																													
EUT M/N:R-414 (FCC ID: APYDMR0154)																																													
Test Target:FCC Part 18																																													
Mode Oper:TX, Boiling Tap Water																																													
Test Equipment:																																													
EMCO Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 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_Neelsh				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	Ftr 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	89.0	53.5	33.0	3.8	-39.7	-40.0	0.6	46.7	11.2	50.0	30.0	-3.3	-18.8	V																														
7.350	3.0	64.0	39.7	35.9	4.9	-40.3	-40.0	0.6	25.1	0.8	50.0	30.0	-24.9	-29.2	V																														
9.800	3.0	62.0	38.0	37.6	5.9	-37.8	-40.0	0.8	28.5	4.5	50.0	30.0	-21.5	-25.5	V																														
12.250	3.0	70.0	44.3	38.8	6.6	-39.4	-40.0	0.9	36.9	11.2	50.0	30.0	-13.1	-18.8	V																														
14.700	3.0	67.0	43.5	40.2	7.2	-40.6	-40.0	0.9	34.7	11.2	50.0	30.0	-15.3	-18.8	V																														
17.150	3.0	60.0	40.0	42.3	7.9	-41.3	-40.0	1.5	30.3	10.3	50.0	30.0	-19.7	-19.7	V																														
4.910	3.0	90.0	58.0	33.0	3.8	-39.7	-40.0	0.6	47.7	15.7	50.0	30.0	-2.3	-14.3	H																														
7.350	3.0	66.0	43.0	35.9	4.9	-40.3	-40.0	0.6	27.1	4.1	50.0	30.0	-22.9	-25.9	H																														
9.800	3.0	62.0	39.8	37.6	5.9	-37.8	-40.0	0.8	28.5	6.3	50.0	30.0	-21.5	-23.7	H																														
12.250	3.0	65.0	42.6	38.8	6.6	-39.4	-40.0	0.9	31.9	9.5	50.0	30.0	-18.1	-20.5	H																														
14.700	3.0	67.2	44.7	40.2	7.2	-40.6	-40.0	0.9	34.9	12.4	50.0	30.0	-15.1	-17.6	H																														
17.150	3.0	60.0	41.3	42.3	7.9	-41.3	-40.0	1.5	30.3	11.6	50.0	30.0	-19.7	-18.4	H																														
<table border="0"> <tr> <td>f</td> <td>Measurement Frequency</td> <td>Amp</td> <td>Preamp Gain</td> <td>Avg Lim</td> <td>Average Field Strength Limit</td> </tr> <tr> <td>Dist</td> <td>Distance to Antenna</td> <td>D Corr</td> <td>Distance Correct to 3 meters</td> <td>Pk Lim</td> <td>Peak Field Strength Limit</td> </tr> <tr> <td>Read</td> <td>Analyzer Reading</td> <td>Avg</td> <td>Average Field Strength @ 3 m</td> <td>Avg Mar</td> <td>Margin vs. Average Limit</td> </tr> <tr> <td>AF</td> <td>Antenna Factor</td> <td>Peak</td> <td>Calculated Peak Field Strength</td> <td>Pk Mar</td> <td>Margin vs. Peak Limit</td> </tr> <tr> <td>CL</td> <td>Cable Loss</td> <td>HPF</td> <td>High Pass Filter</td> <td></td> <td></td> </tr> </table>																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		
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-2M226

02/14/05 High Frequency Measurement																
Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Chun Pang																
Project #: 05U3271-1																
Company: Sharp Electronic Corp.																
EUT Descrip.: Microwave Oven, Magnetron, 2M226--VFU																
EUT M/N: R-414 (FCC ID: APYDMR0154)																
Test Target: FCC Part 18																
Mode Oper: TX, Boiling Tap Water																
Test Equipment:																
EMCO Horn 1-18GHz				Pre-amplifier 1-26GHz				Pre-amplifier 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		Peak Measurements				
		3_Chin				12_Neelesh		HPF_4.0GHz				RBW=VBW=1MHz				
Average Measurements																
RBW=1MHz ; VBW=10Hz																
f	Dist	Read Pk	Read Avg	AF	CL	Amp	D Corr	Fldr	Peak	Avg	Pk Lim	Avg Lim	Pk Mar	Avg Mar	Notes	
GHz	(m)	dBuV	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	(V/H)	
4.910	3.0	84.0	51.5	33.0	3.8	-39.7	-40.0	0.6	41.7	9.2	50.0	30.0	-8.3	-20.8	V	
7.350	3.0	67.5	45.3	35.9	4.9	-40.3	-40.0	0.6	28.6	6.4	50.0	30.0	-21.4	-23.6	V	
9.800	3.0	72.0	44.5	37.6	5.9	-37.8	-40.0	0.8	38.5	11.0	50.0	30.0	-11.5	-19.0	V	
12.250	3.0	64.0	43.2	38.8	6.6	-39.4	-40.0	0.9	30.9	10.1	50.0	30.0	-19.1	-19.9	V	
14.700	3.0	66.0	45.0	40.2	7.2	-40.6	-40.0	0.9	33.7	12.7	50.0	30.0	-16.3	-17.3	V	
17.150	3.0	60.0	41.0	42.3	7.9	-41.3	-40.0	1.5	30.3	11.3	50.0	30.0	-19.7	-18.7	V	
4.910	3.0	80.0	46.5	33.0	3.8	-39.7	-40.0	0.6	37.7	4.2	50.0	30.0	-12.3	-25.8	H	
7.350	3.0	64.0	44.0	35.9	4.9	-40.3	-40.0	0.6	25.1	5.1	50.0	30.0	-24.9	-24.9	H	
9.800	3.0	78.0	47.5	37.6	5.9	-37.8	-40.0	0.8	44.5	14.0	50.0	30.0	-5.5	-16.0	H	
12.250	3.0	56.0	38.5	38.8	6.6	-39.4	-40.0	0.9	22.9	5.4	50.0	30.0	-27.1	-24.6	H	
14.700	3.0	63.0	43.0	40.2	7.2	-40.6	-40.0	0.9	30.7	10.7	50.0	30.0	-19.3	-19.3	H	
17.150	3.0	66.0	44.6	42.3	7.9	-41.3	-40.0	1.5	36.3	14.9	50.0	30.0	-13.7	-15.1	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									

5.8.4. MAGNETRON - 2M253J(L)

02/14/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site																
Test Engr: Chin Pang Project #: 05U3271-1 Company: Sharp Electronic Corp. EUT Descr.: Microwave Oven, Magnetron, 2M253J--VFU EUT M/N: R-414 (FCC ID: APYDMR0154) Test Target: FCC Part 18 Mode Oper: TX, Boiling Tap Water																
Test Equipment:																
EMCO Horn 1-18GHz T73; S/N: 6717 @3m		Pre-amplifier 1-26GHz T87 Miteq 924342		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit FCC 15.209								
Hi Frequency Cables																
2 foot cable		3 foot cable 3_Chin		4 foot cable		12 foot cable 12_Neelesh		HPF HPF_4.0GHz		Reject Filter		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	Fldr 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	81.0	49.5	33.0	3.8	-39.7	-40.0	0.6	38.7	7.2	50.0	30.0	-11.3	-22.8	V	
7.350	3.0	68.7	43.0	35.9	4.9	-40.3	-40.0	0.6	29.8	4.1	50.0	30.0	-20.2	-25.9	V	
9.800	3.0	80.5	45.0	37.6	5.9	-37.8	-40.0	0.8	47.0	11.5	50.0	30.0	-3.0	-18.5	V	
12.250	3.0	64.0	43.0	38.8	6.6	-39.4	-40.0	0.9	30.9	9.9	50.0	30.0	-19.1	-20.1	V	
14.700	3.0	60.2	42.5	40.2	7.2	-40.6	-40.0	0.9	27.9	10.2	50.0	30.0	-22.1	-19.8	V	
17.150	3.0	66.0	43.0	42.3	7.9	-41.3	-40.0	1.5	36.3	13.3	50.0	30.0	-13.7	-16.7	V	
4.910	3.0	84.0	47.3	33.0	3.8	-39.7	-40.0	0.6	41.7	5.0	50.0	30.0	-8.3	-25.0	H	
7.350	3.0	72.0	45.6	35.9	4.9	-40.3	-40.0	0.6	33.1	6.7	50.0	30.0	-16.9	-23.3	H	
9.800	3.0	73.0	44.0	37.6	5.9	-37.8	-40.0	0.8	39.5	10.5	50.0	30.0	-10.5	-19.5	H	
12.250	3.0	65.0	42.5	38.8	6.6	-39.4	-40.0	0.9	31.9	9.4	50.0	30.0	-18.1	-20.6	H	
14.700	3.0	60.0	39.6	40.2	7.2	-40.6	-40.0	0.9	27.7	7.3	50.0	30.0	-22.3	-22.7	H	
17.150	3.0	65.2	40.5	42.3	7.9	-41.3	-40.0	1.5	35.5	10.8	50.0	30.0	-14.5	-19.2	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	05U3271-1	☒

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
0.88	53.72	--	15.22	0.00	56.00	46.00	-2.28	-30.78	L1
1.49	58.66	41.20	11.90	0.00	56.00	46.00	-14.80	-34.10	L1
1.73	52.76	--	11.76	0.00	56.00	46.00	-3.24	-34.24	L1
0.88	51.46	--	14.41	0.00	56.00	46.00	-4.54	-31.59	L2
1.84	49.70	--	9.92	0.00	56.00	46.00	-6.30	-36.08	L2
2.57	47.60	--	12.91	0.00	56.00	46.00	-8.40	-33.09	L2
6 Worst Data Magnetron-2M246(VFU)									

5.9.2. 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
0.74	44.70	--	9.30	0.00	56.00	46.00	-11.30	-36.70	L1
0.89	45.80	--	10.25	0.00	56.00	46.00	-10.20	-35.75	L1
2.49	44.84	--	8.70	0.00	56.00	46.00	-11.16	-37.30	L1
0.83	46.52	--	12.04	0.00	56.00	46.00	-9.48	-33.96	L2
0.94	49.90	--	7.97	0.00	56.00	46.00	-6.10	-38.03	L2
1.32	45.66	--	12.08	0.00	56.00	46.00	-10.34	-33.92	L2
6 Worst Data Magnetron-2M167B (VFU)									

5.9.3. 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
1.34	46.17	--	10.89	0.00	56.00	46.00	-9.83	-35.11	L1
1.84	55.98	--	17.20	0.00	56.00	46.00	-0.02	-28.80	L1
2.54	50.70	--	15.15	0.00	56.00	46.00	-5.30	-30.85	L1
0.51	44.60	--	6.88	0.00	56.00	46.00	-11.40	-39.12	L2
1.66	50.18	--	8.11	0.00	56.00	46.00	-5.82	-37.89	L2
2.54	48.26	--	11.77	0.00	56.00	46.00	-7.74	-34.23	L2
6 Worst Data									
Magnetron-2M226 (VFU)									

5.9.4. MAGNETRON-2M253J(L)

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
0.78	58.20	43.70	20.48	0.00	56.00	46.00	-12.30	-25.52	L1
1.93	57.04	45.60	18.87	0.00	56.00	46.00	-10.40	-27.13	L1
2.88	58.78	46.50	23.22	0.00	56.00	46.00	-9.50	-22.78	L1
0.61	48.96	--	13.59	0.00	56.00	46.00	-7.04	-32.41	L2
0.78	51.12	--	12.46	0.00	56.00	46.00	-4.88	-33.54	L2
2.92	51.66	--	13.81	0.00	56.00	46.00	-4.34	-32.19	L2
6 Worst Data									
Magnetron-2M253J (VFU)									

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

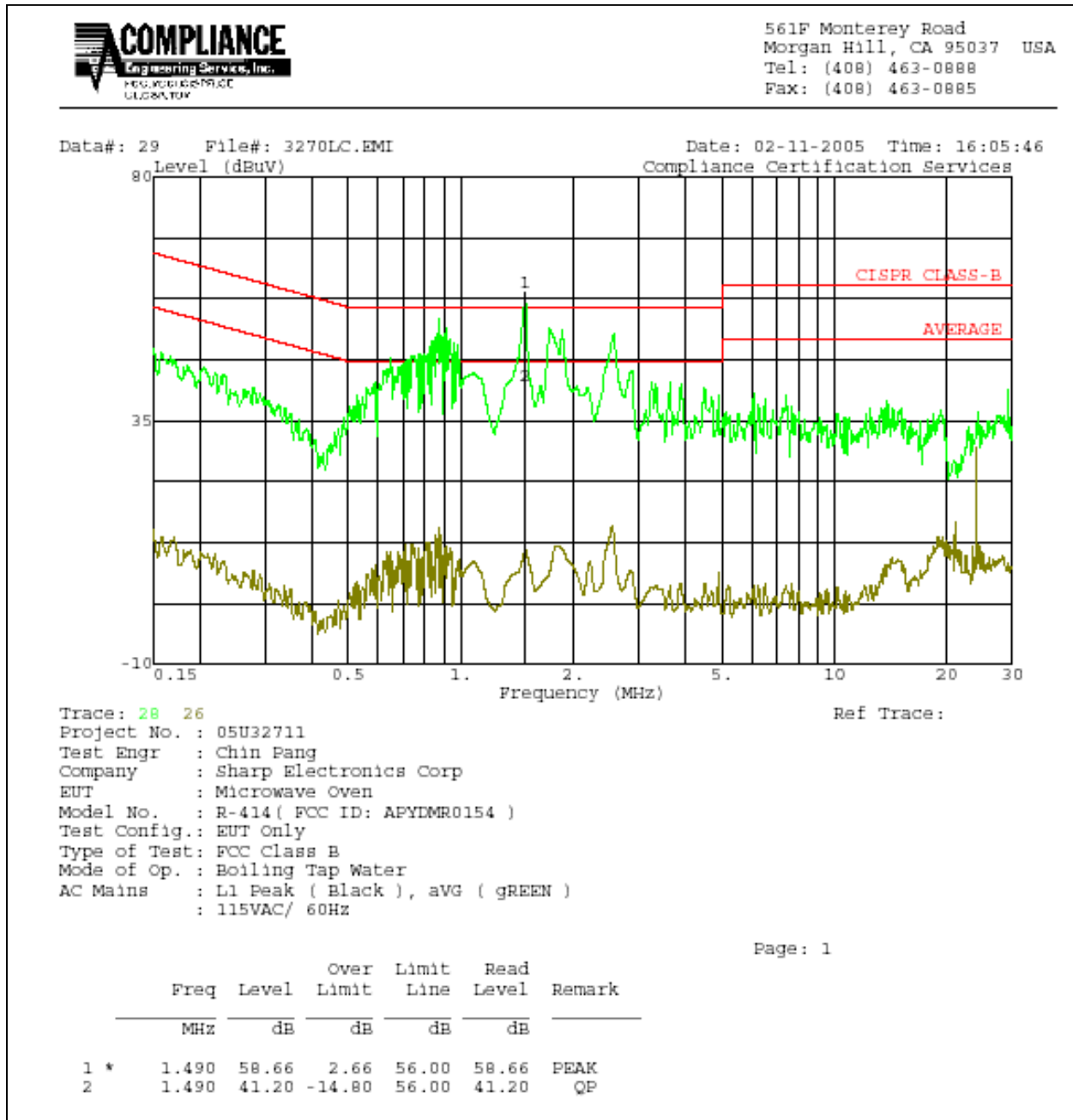
A=Average Reading

Comments: N/A

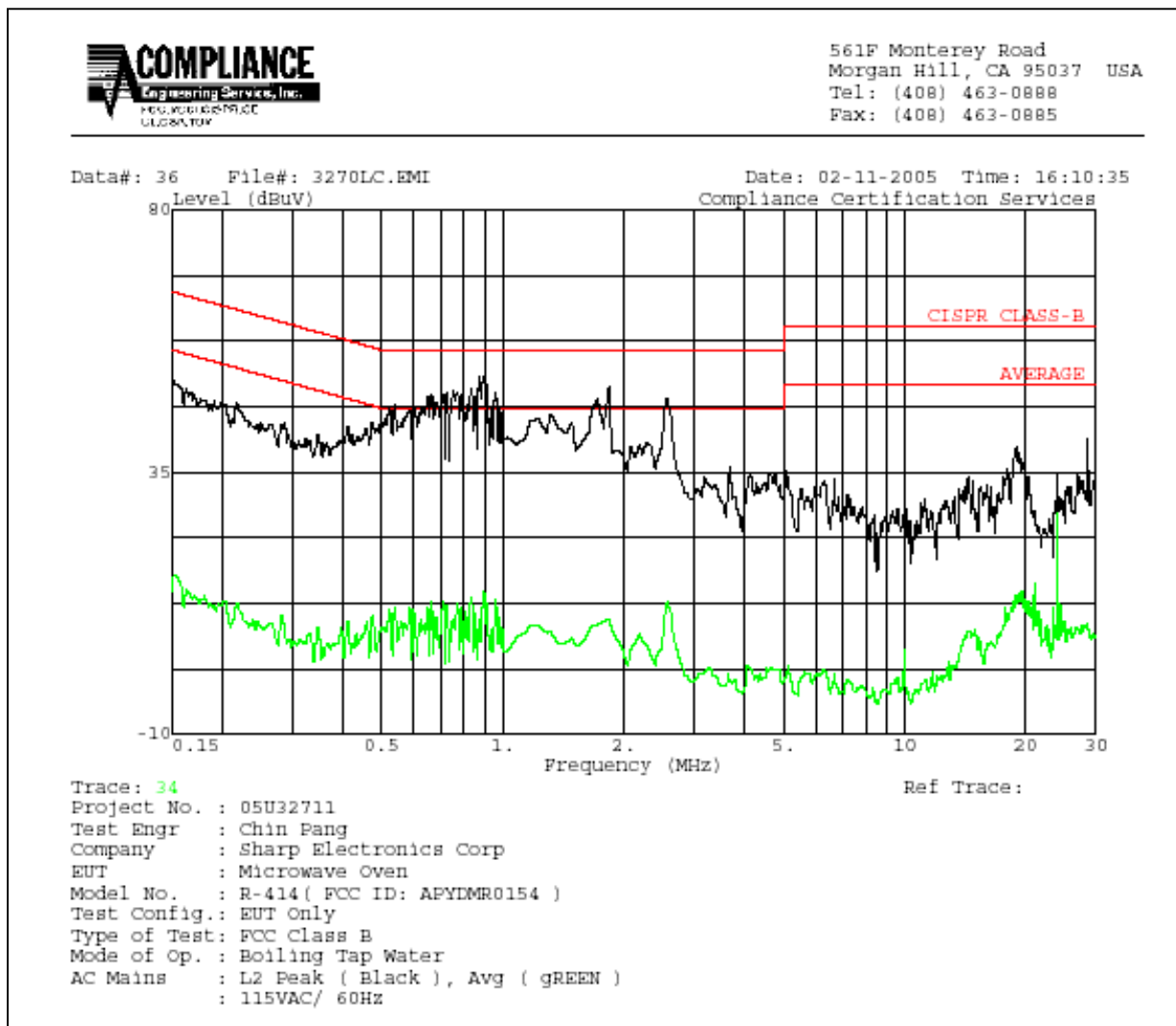
Conducted Emission Plot

MAGNETRON-2M246

LINE 1

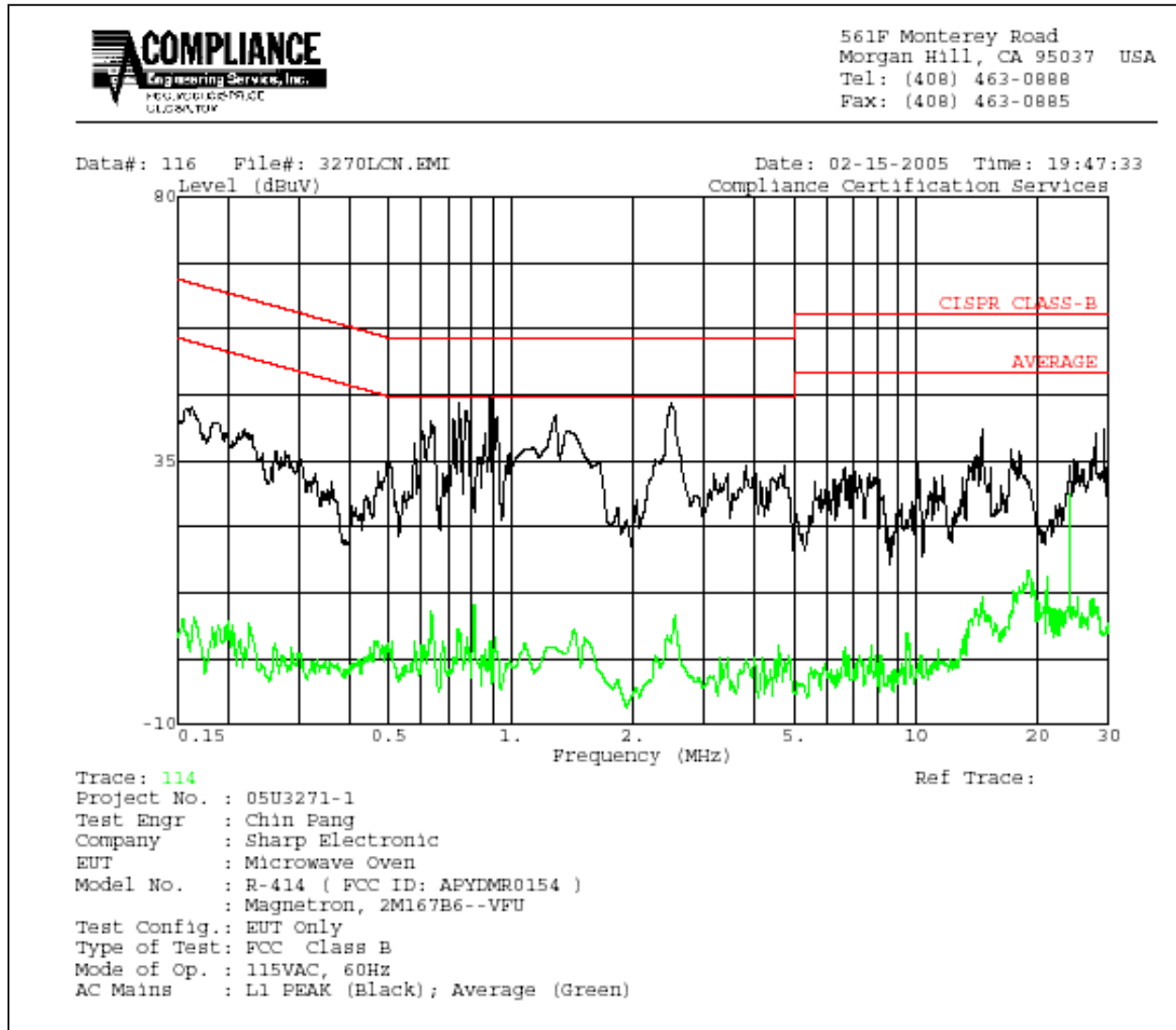


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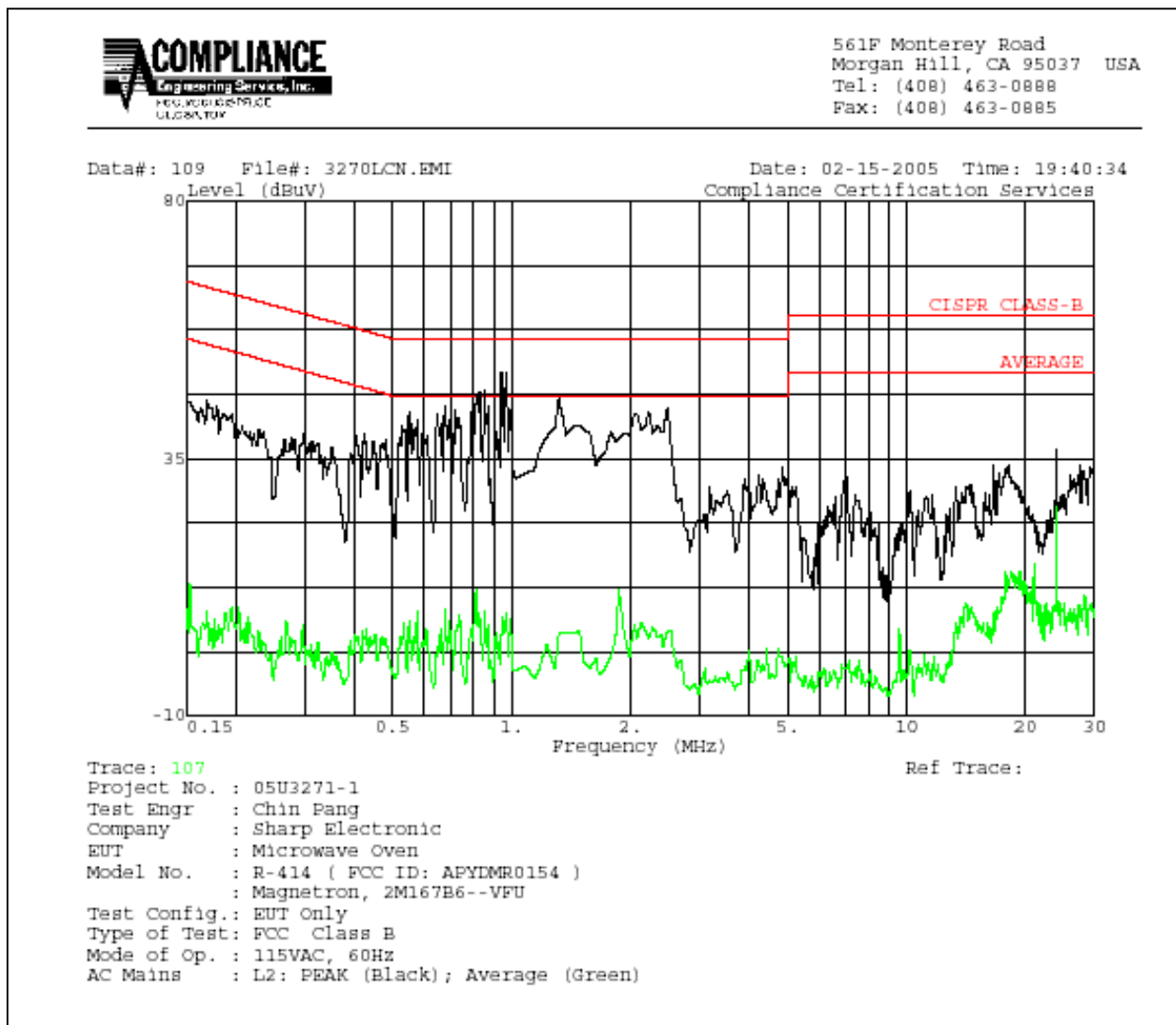


MAGNETRON-2M167B

LINE 1

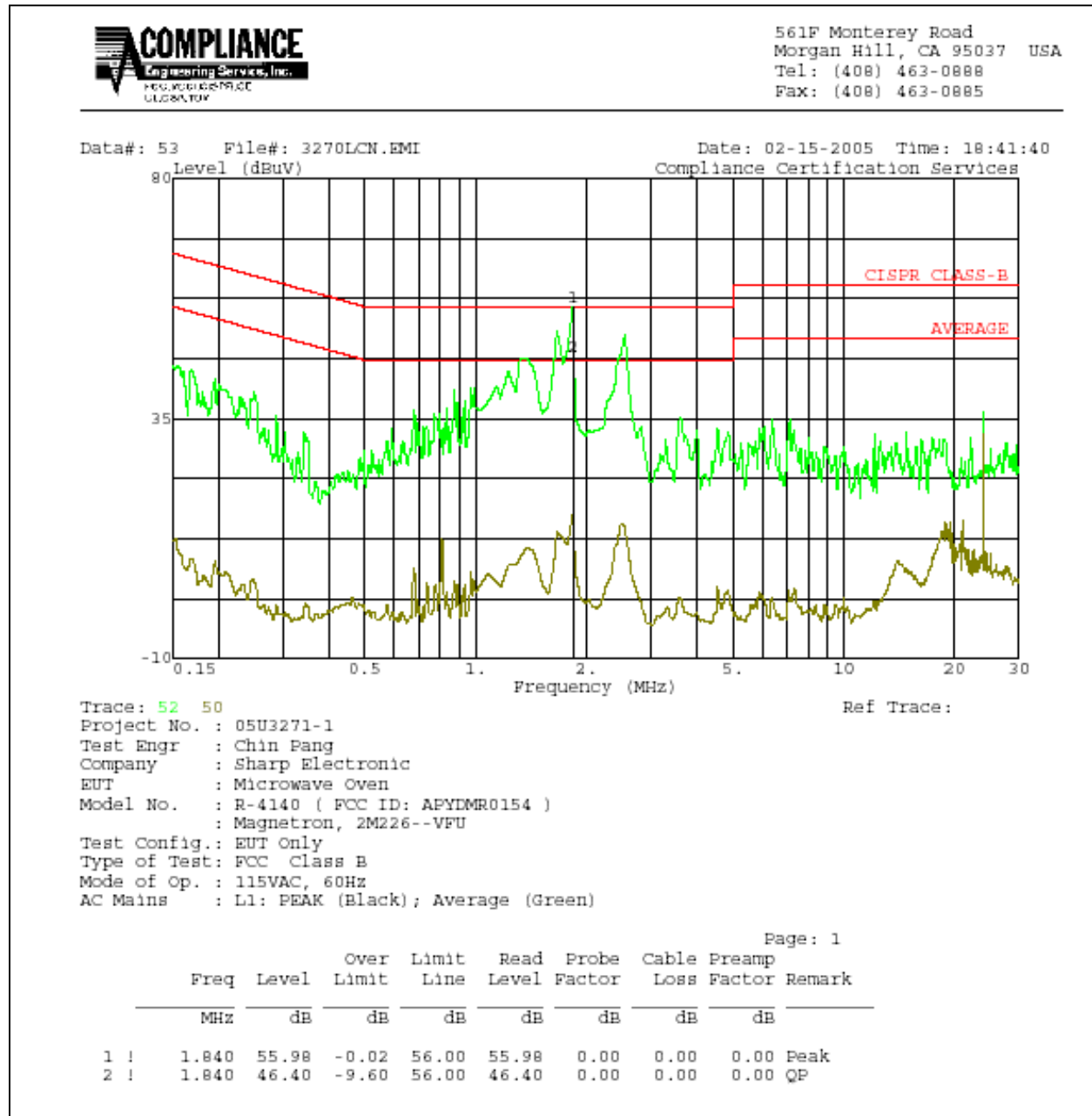


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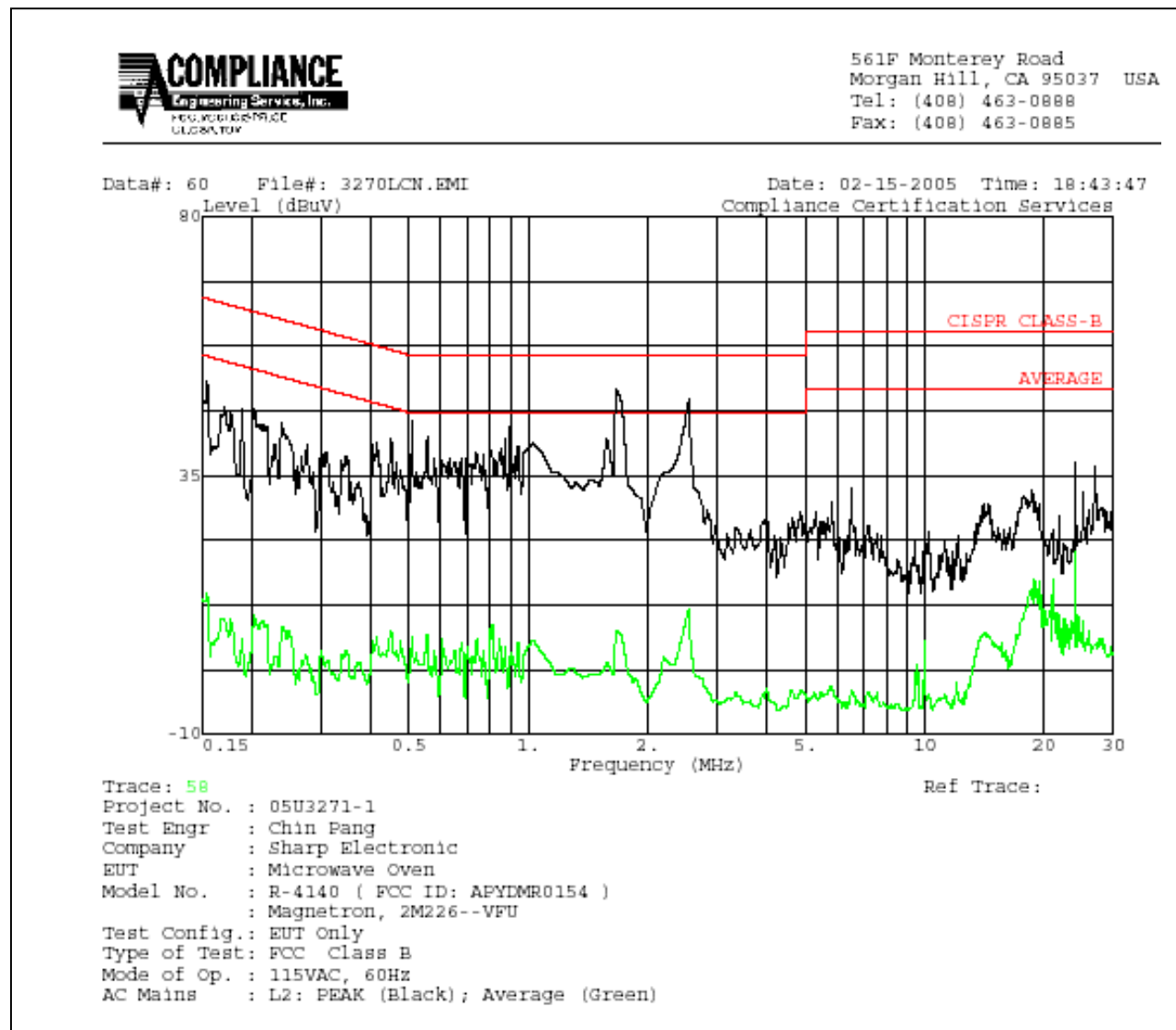


MAGNETRON-2M226

LINE 1

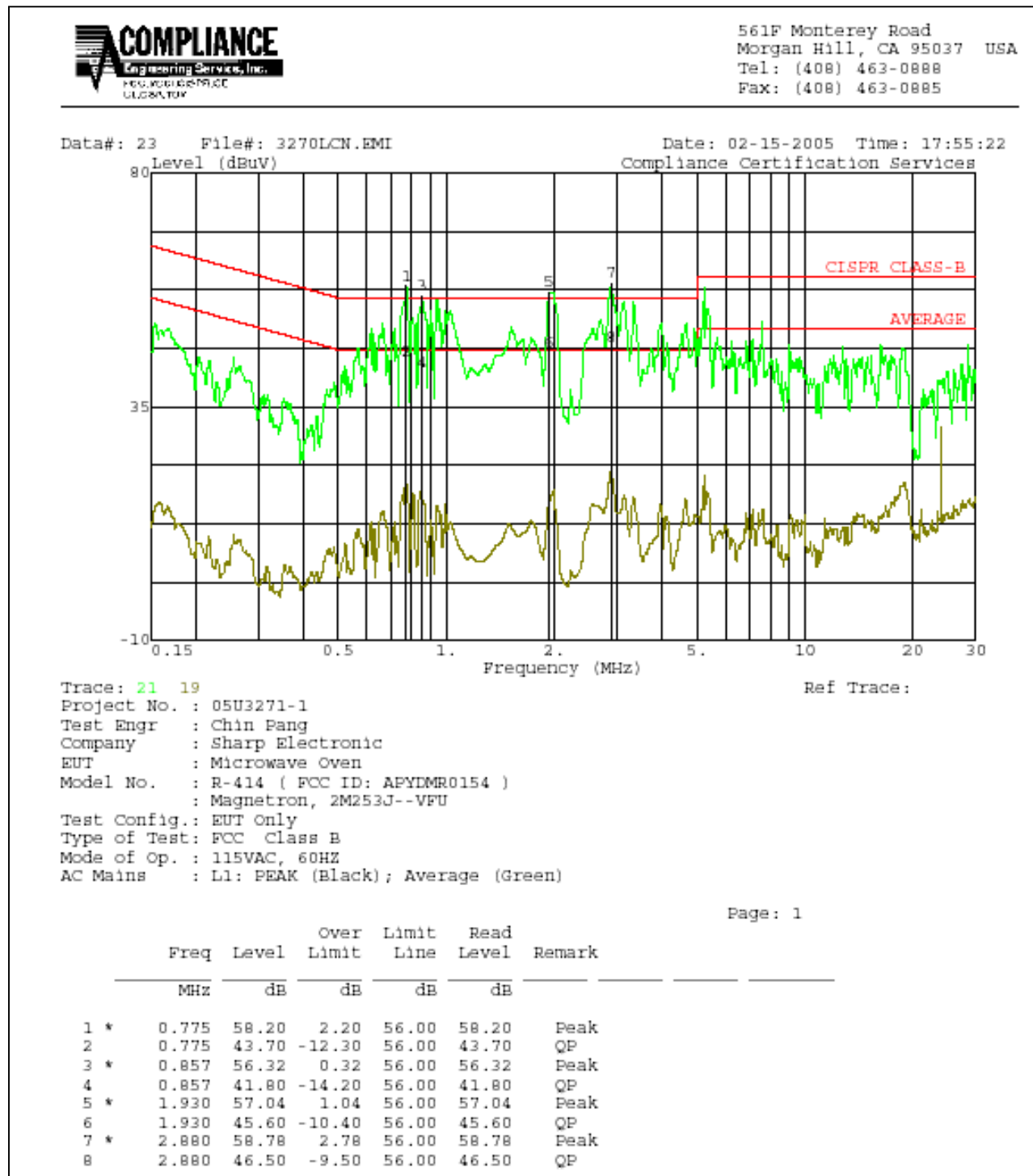


LINE 2

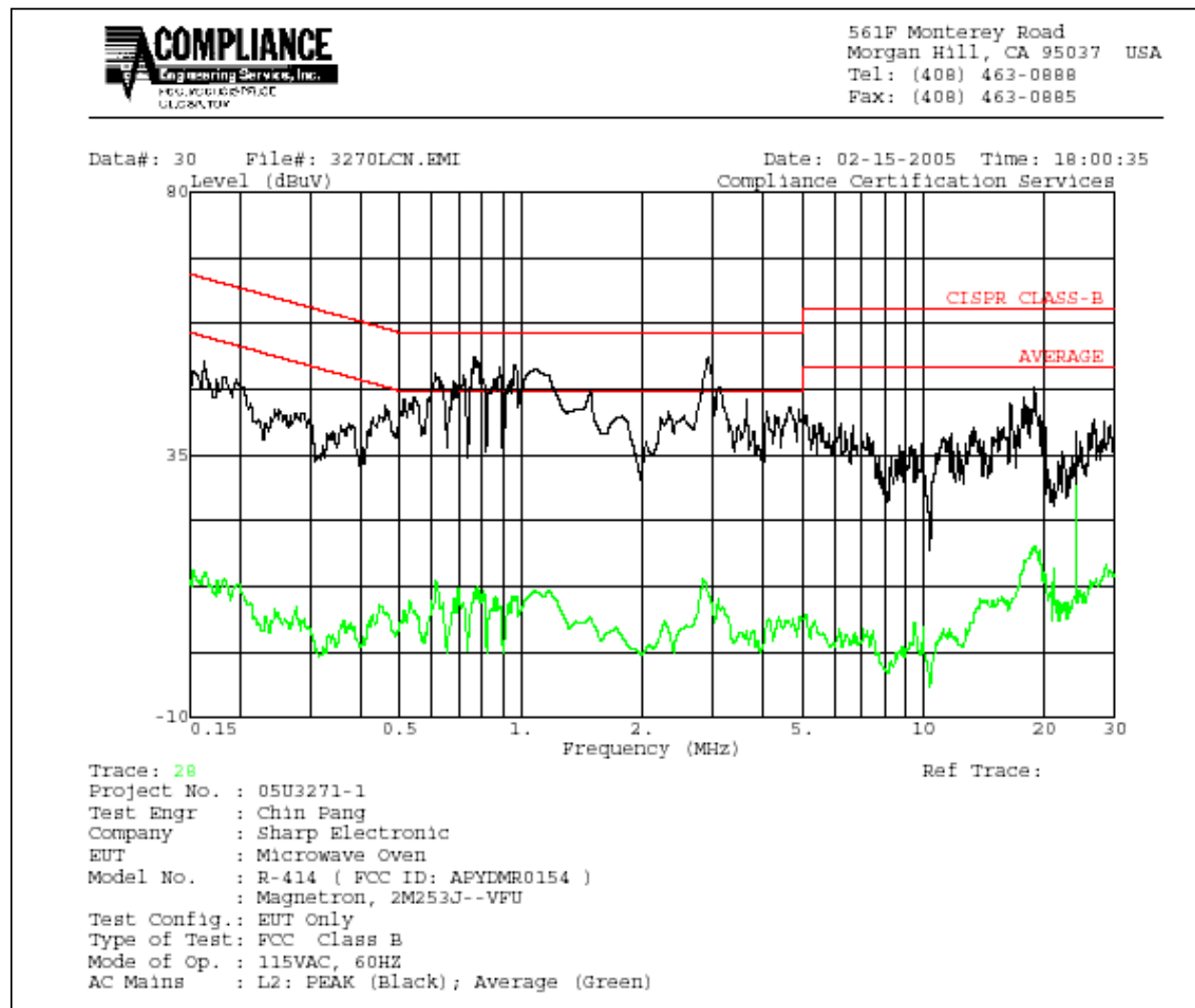


MAGNETRON - 2M253J(L)

LINE 1



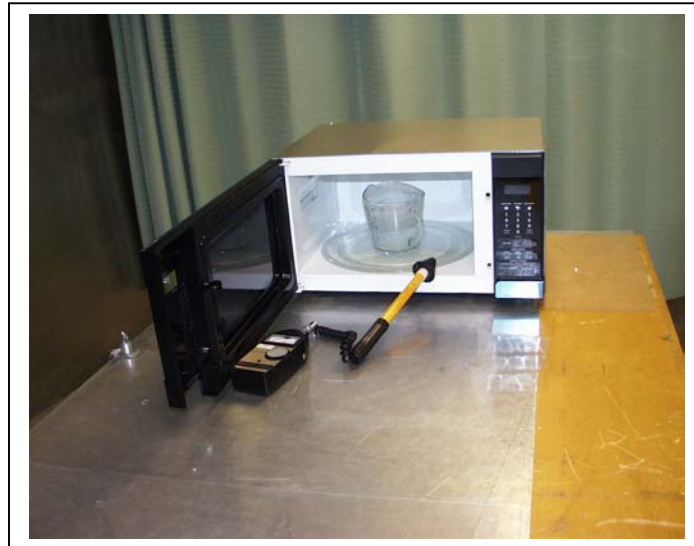
LINE 2



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