FCC CFR47 PART 18 SUBPART C
ISM EQUIPMENT

TEST REPORT

FOR

MICROWAVE OVEN

MODEL NUMBER: E30S075DSS

MAGNETRON MODEL: 2M253H(L)

FCC ID: APYDMR0166

REPORT NUMBER: 05U3560

ISSUE DATE: SEPTEMBER 06, 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
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LAB CODE:200065-0

Revision History

Rev.	Date	Revisions	Revised By
A	8/29/05	Initial Issue	Thu
B	9/6/05	Revised the percentage of voltage measurement on page 14 according to Client's specified manual and correct the typo of 1000W on page 6.	Thu

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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: E30S075DSS

SERIAL NUMBER: 7G53006092

MAGNETRON MODEL: 2M253H (L)

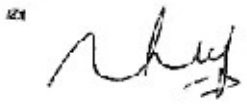
DATE TESTED: AUGUST 11-25, 2005

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:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC Part 18 Subpart C, ANSI C63.4-2003, and FCC / OST MP-5, "FCC Metherod of Measurements of Radio Noise Emission From Industrial, Scientific, and Medical Equipment".

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. PRODUCT DESCRIPTION

The equipment under test is a microwave oven sold for consumer use. Model: E30S075DSS is a 1000 W microwave oven with digital controls panel.

Magnetron Model: 2M253H(L)

6. MEASUREMENT EQUIPMENT LIST

TEST EQUIPMENT LIST				
Name of Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Due Date**
EMI Receiver, 9 kHz ~ 2.9 GHz	**HP**	**8542E**	**3942A00286**	**3/29/2006**
RF Filter Section	**HP**	**85420E**	**3705A00256**	**3/29/2006**
Antenna, Bilog 30MHz ~ 2Ghz	**Sunol Sciences**	**JB1**	**A121003**	**3/3/2006**
Spectrum Analyzer 3 Hz ~ 44 GHz	**Agilent**	**E4446A**	**US42070220**	**1/1/2006**
Antenna, Horn 1 ~ 18 GHz	**EMCO**	**3115**	**2238**	**4/22/2006**
Spectrum Analyzer	**HP**	**E4446A**	**US42510266**	**8/25/2005**
EMI Test Receiver	**R & S**	**ESHS 20**	**827129/006**	**10/22/2005**
Site A Line Stabilizer / Conditioner	**Tripplite**	**LC-1800a**	**A0051681**	**CNR**
LISN, 10 kHz ~ 30 MHz	**FCC**	**LISN-50/250-25-2**	**2023**	**8/30/2005**
Digital Power Analyzer	**Valhalla**	**2111A**	**NA**	**4/20/2006**
Ajustable Power Supply	**The Superior Electric Co.**	**Powerstat**	**NA**	**CNR**
Microwave Leakage Tester	**Simpson**	**380-2**	**6-115310**	**9/28/2005**

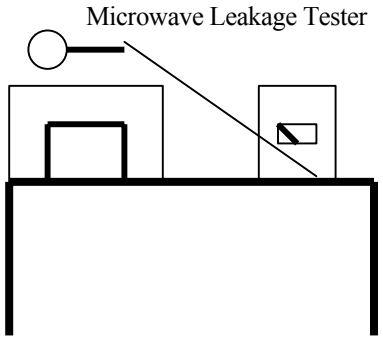
7. LIMITS AND RESULTS

7.1. RADIATION HAZARD MEASUREMENT

Limits:

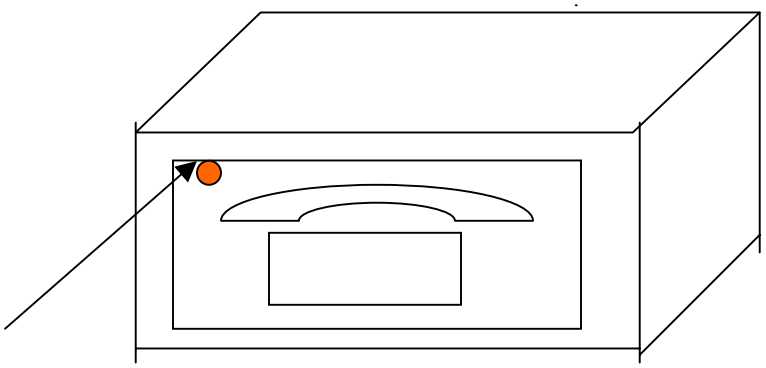
FCC METHEROD OF MEASUREMENTS OF RADIO NOISE EMISSION FROM INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT, FCC / OST MP-5. SECTION 3.1

Test Procedure:



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.

Test Result:



0.15 mW/cm2

	Maximum Leakage (mW/cm2)	Limit (mW/cm2)
Figure shown above for the location of maximum leakage	**0.15**	**1.00**
All Others	**0.1**	**1.00**

7.2. INPUT POWER

Limit

FCC METHEROD OF MEASUREMENTS OF RADIO NOISE EMISSION FROM INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT, FCC / OST MP-5. SECTION 4.3

Test Procedure

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.

Test Result:

Input Voltage (Vac)	Input Current (Amps)	Measured Input Power (Watts)
240	**7.84**	**1881.6**

7.3. RF OUTPUT POWER MEASUREMENT

Limit

FCC METHEROD OF MEASUREMENTS OF RADIO NOISE EMISSION FROM INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT, FCC / OST MP-5. SECTION 4.3

Test Procedure

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.

Test Result:

Start Temp (°C)	Final Temp (°C)	Elapsed Time (120 sec)	RF Power (Watts)
28.20	**52.30**	**120**	**857.5**
28.50	**52.80**	**120**	**850.50**
29.80	**56.60**	**120**	**1072**

Average of 3 Trials : 926.33 W

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

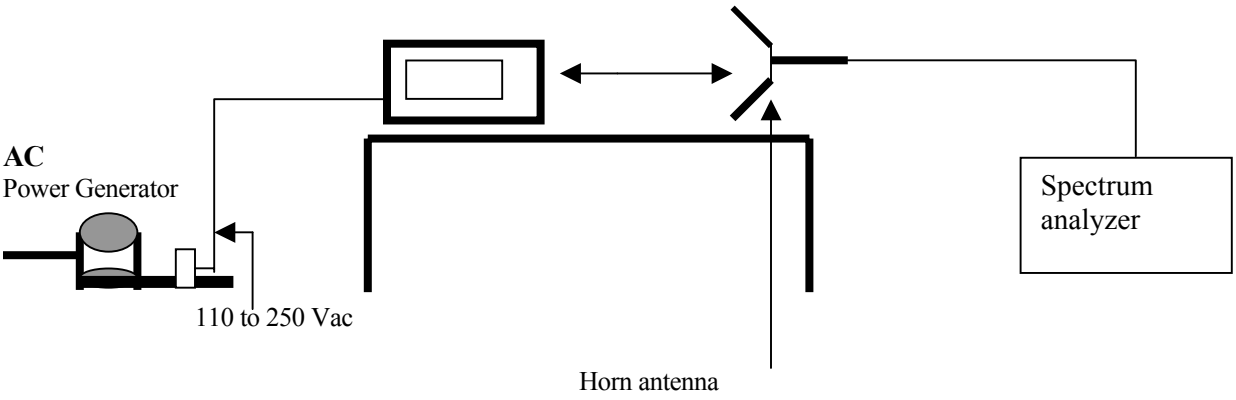
The measured output was found to be OVER 500Watts. Therefore, in accordance with section 18.305 of Subpart B, the measured out-of-band emissions were compared to the 25 √Power/500 @ 300m limit.

7.4. OPERATING FREQUENCY MEASUREMENTS

Limit

FCC PART 18 SUBPART C, § 18.301

Test Procedure



Operating Frequency Measurement Set-up

Test Result:

7.4.1. VARIATION IN OPERATING FREQUENCY WITH TIME

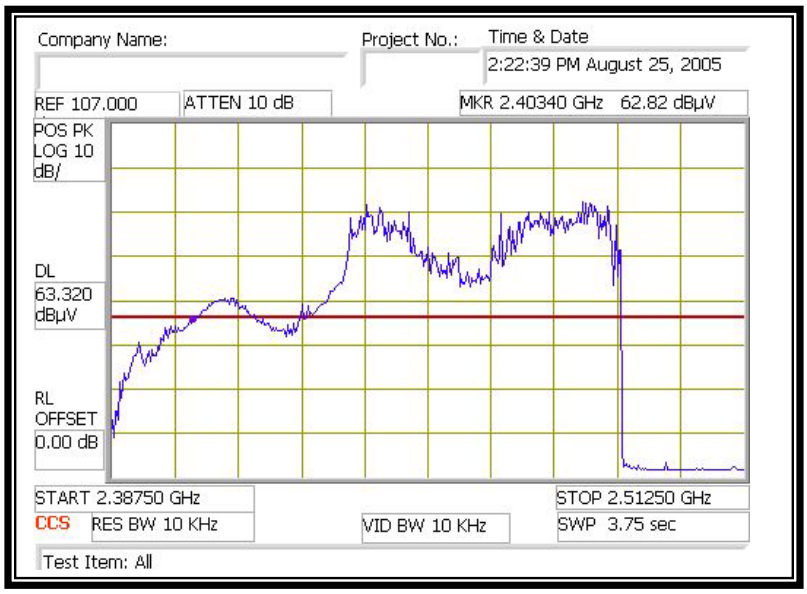
The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000-ml water load was placed in the center of the oven and the oven was operated at maximum output power.

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

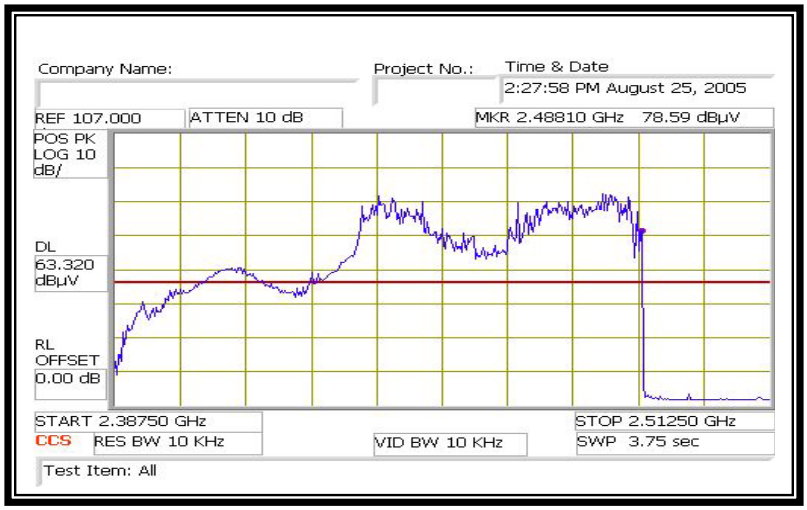
The results of this test are as follows.

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

	Freq. (MHz)
Minimum Frequency (2400 MHz)	**2403.40**
Maximum Frequency (2500 MHz)	**2488.10**



Minimum Frequency @ 240Vac



Maximum Frequency @ 240Vac

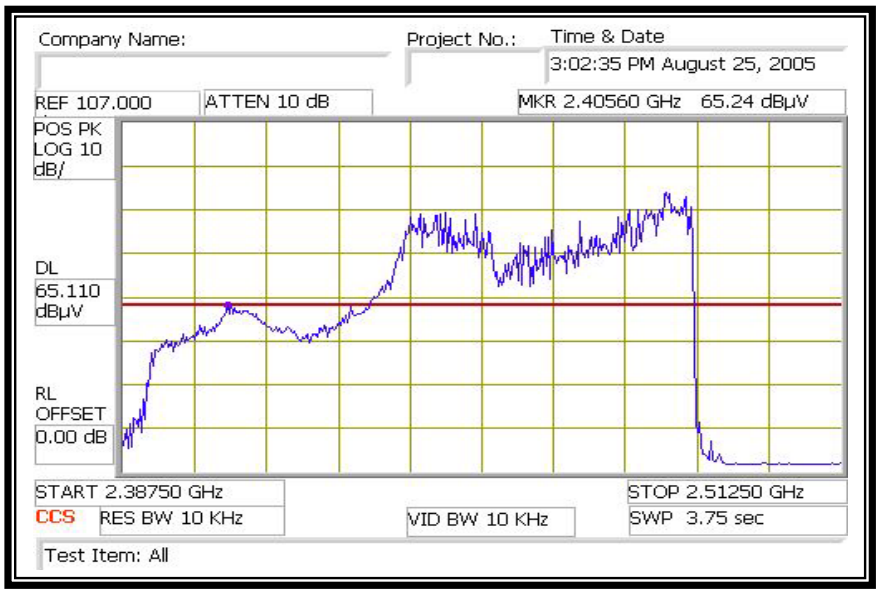
7.4.2. VARIATION IN OPERATING FREQUENCY WITH VOLTAGE

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 -6.25% and +6.7% of the nominal rating.(The Unit Under Test power specification).

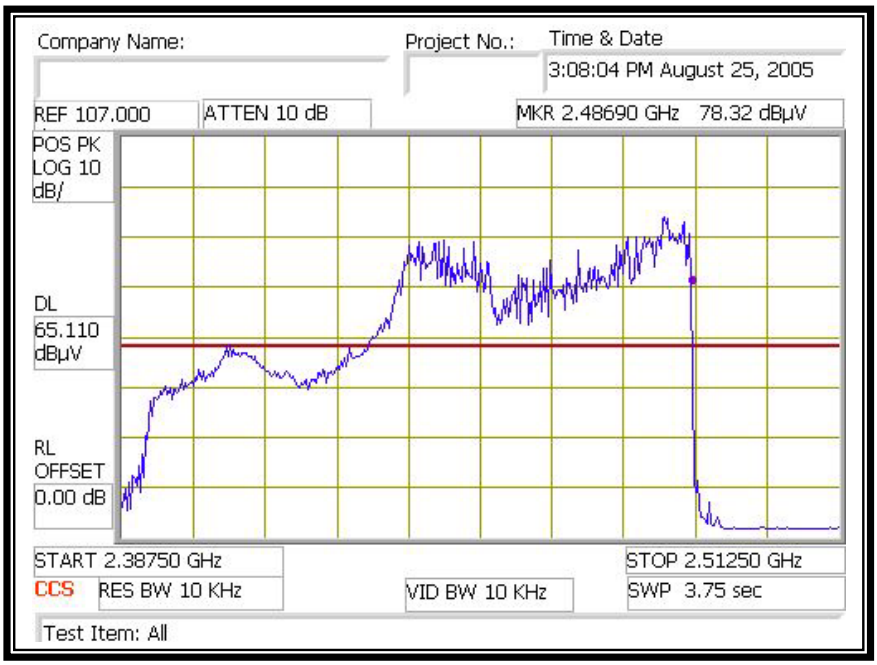
The water load was 1000 ml at the start of the test.

The results of this test are as follows:

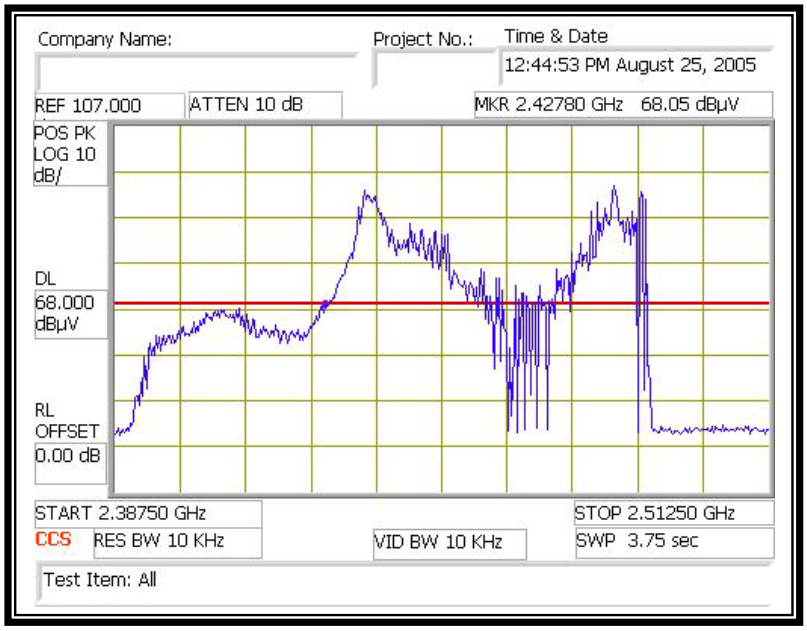
	225Vac (MHz)	**240Vac (MHz)**	**256Vac (MHz)**
Minimum Frequency (2400 MHz)	**2405.60**	**2403.40**	**2427.80**
Maximum Frequency (2500 MHz)	**2486.90**	**2488.10**	**2489.70**



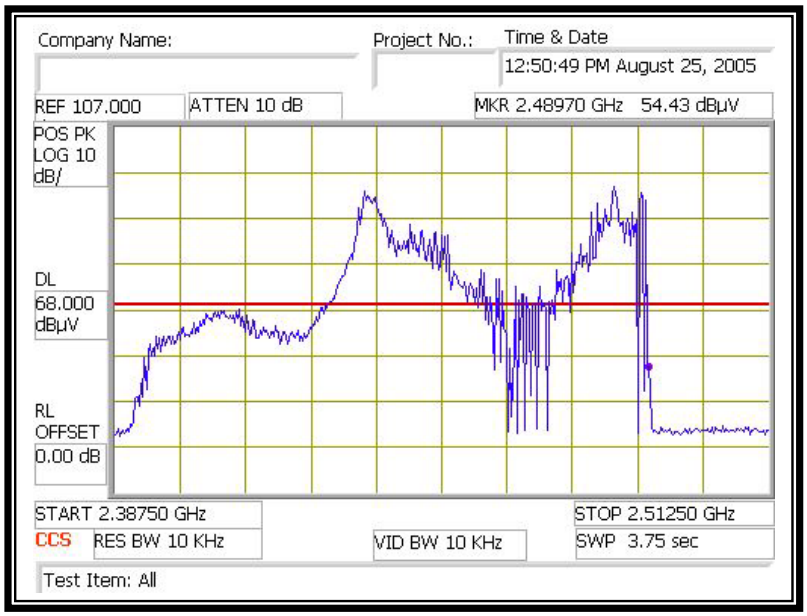
Minimum Frequency @ 225Vac



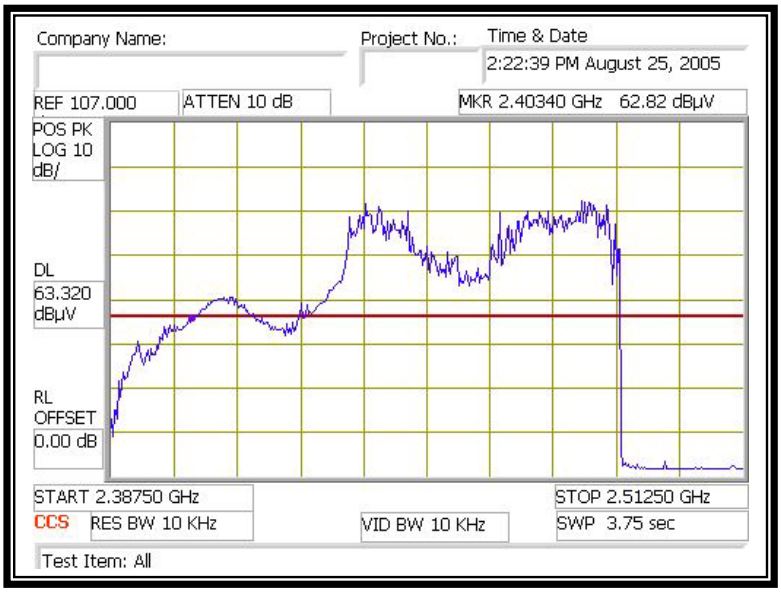
Maximum Frequency @ 225Vac



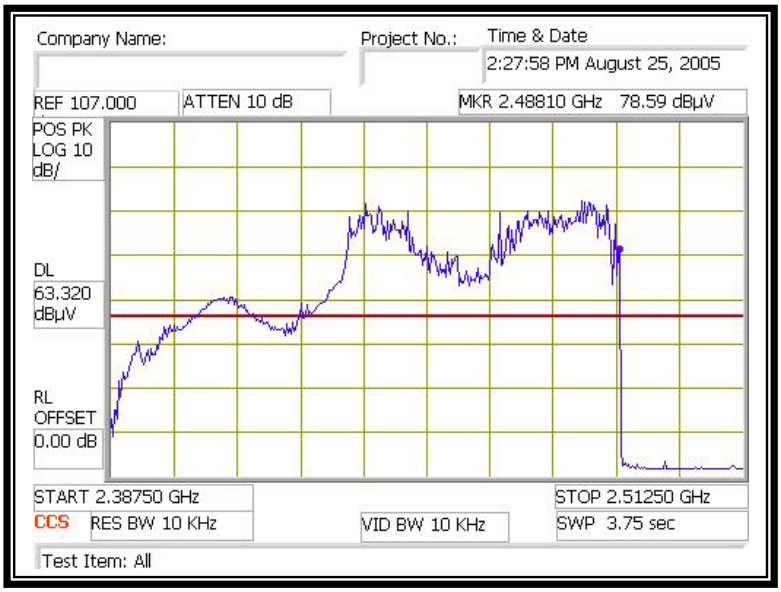
Minimum Frequency @ 256Vac



Maximum Frequency @ 256Vac



Minimum Frequency @ 240Vac



Maximum Frequency @ 240Vac

7.5. RADIATED EMISSIONS

Limit

FCC PART 18 SUBPART C, § 18.305

Test Procedure

Radiated emissions were measured over an inclusive frequency range to 100MHz through the tenth harmonic of the operating frequency. For this test, an 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.

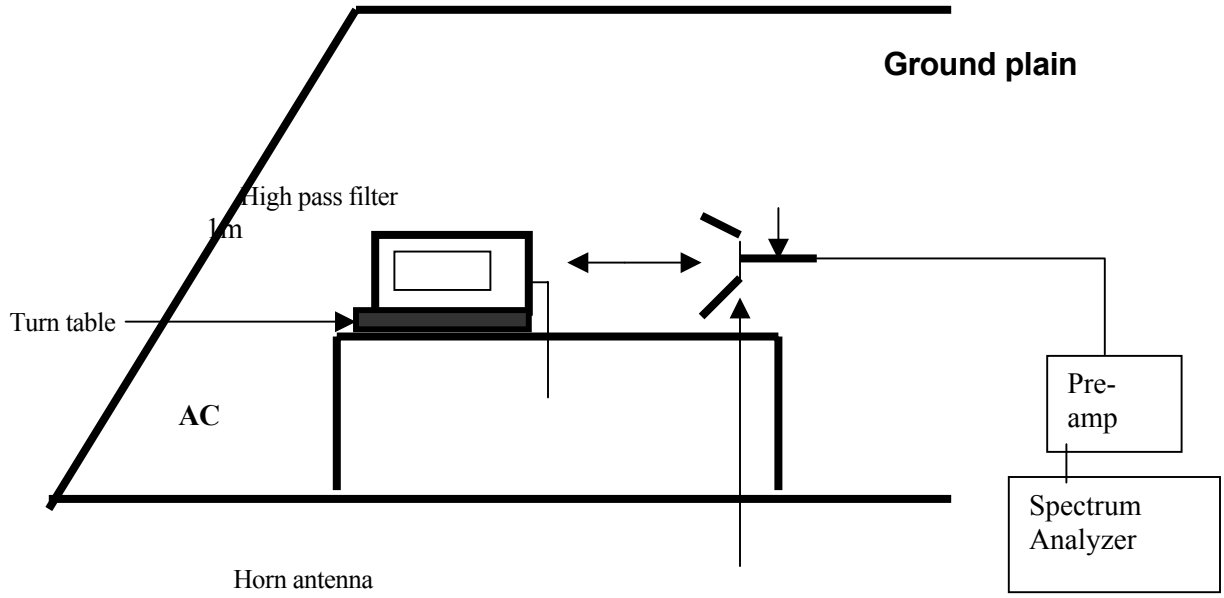
During the preliminary tests, the load consisted of 700-ml tap water placed in the center of the oven. The emissions were observed while the device under test was operated at maximum output power.

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

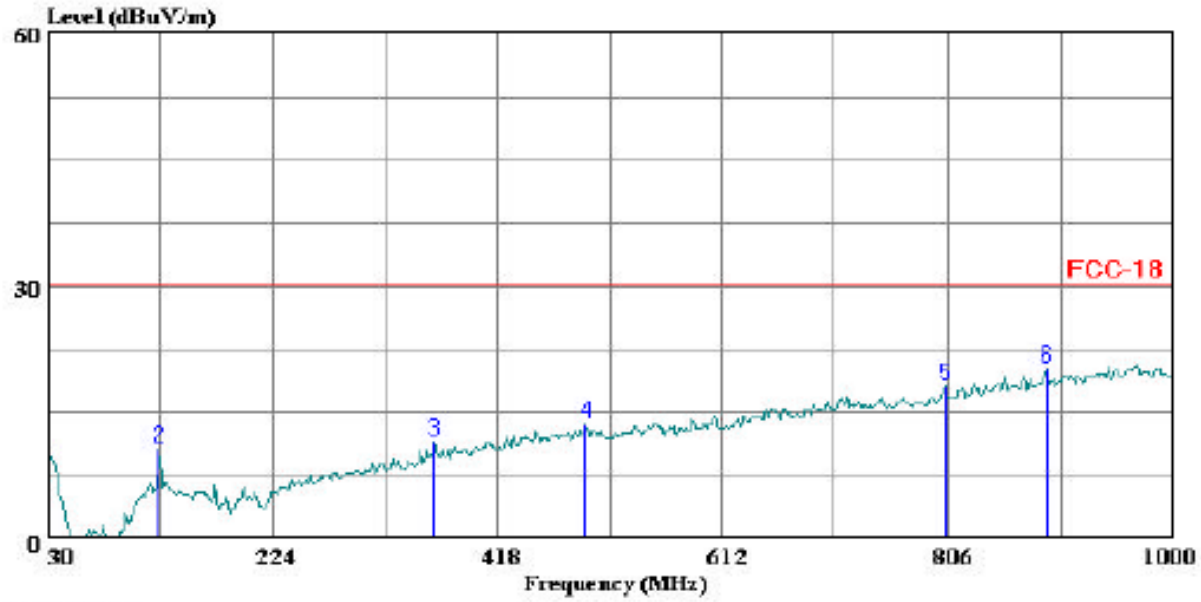
7.5.1. RADIATED EMISSIONS – BELOW 1GHz

An offset of 40.00 dB has been given for distance correction.

HORIZONTAL PLOT

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

Data#: 6 File#: below1Ghz.EMI Date: 08-12-2005 Time: 13:07:01



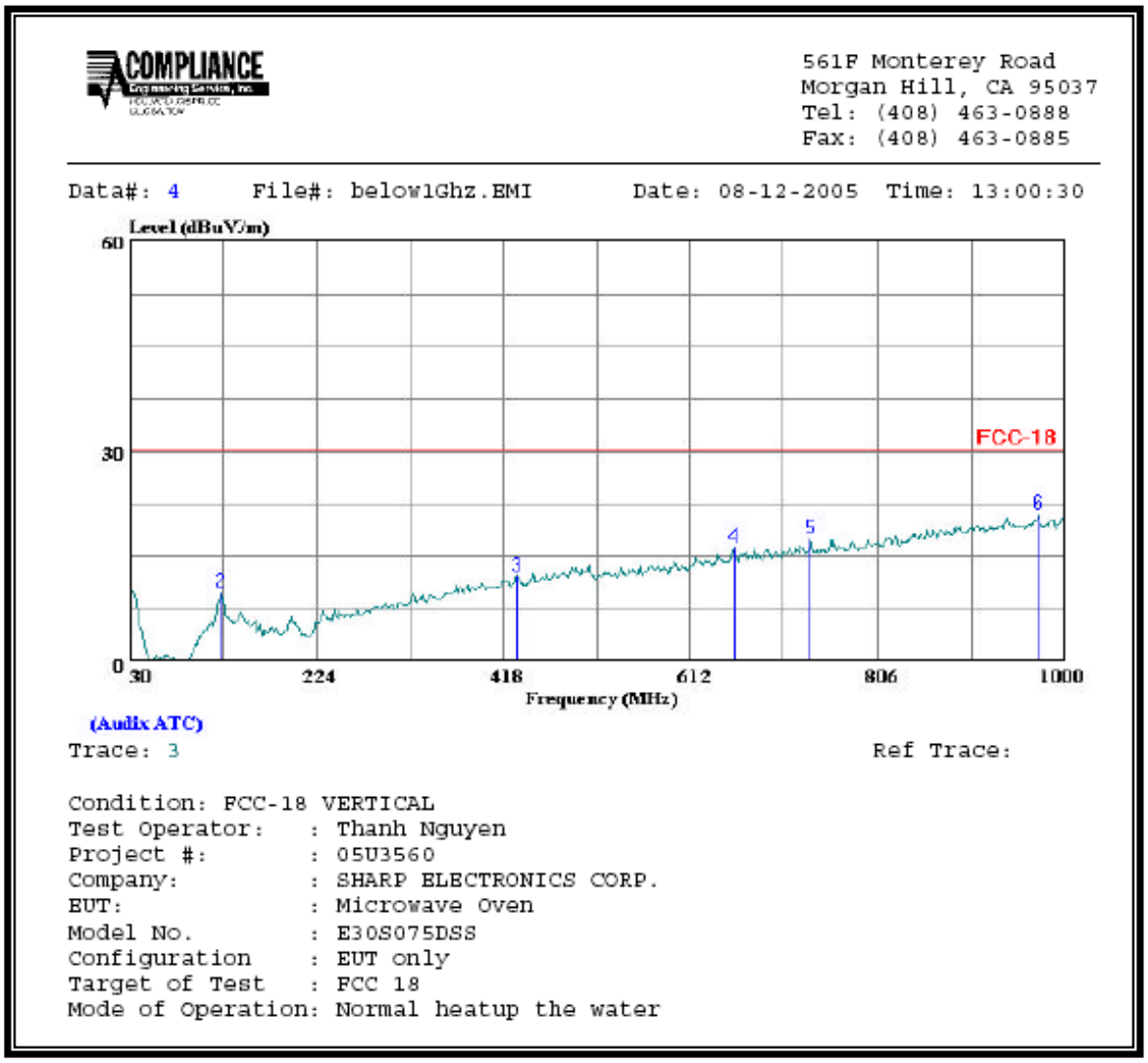
(Audix ATC)
Trace: 5 Ref Trace:

Condition: FCC-18 HORIZONTAL
Test Operator: : Thanh Nguyen
Project #: : 05U3560
Company: : SHARP ELECTRONICS CORP.
EUT: : Microwave Oven
Model No. : E30S075DSS
Configuration : EUT only
Target of Test : FCC 18
Mode of Operation: Normal heatup the water

HORIZONTAL DATA,

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	30.000	-9.61	20.45	10.84	30.30	-19.46	Peak	0.45	20.00
2	126.030	-4.56	15.25	10.69	30.30	-19.61	Peak	0.93	14.32
3	363.680	-5.82	17.23	11.41	30.30	-18.89	Peak	1.65	15.58
4	494.630	-6.62	20.14	13.52	30.30	-16.78	Peak	1.99	18.15
5	803.090	-6.54	24.59	18.05	30.30	-12.25	Peak	2.65	21.94
6	890.390	-5.70	25.81	20.11	30.30	-10.19	Peak	2.94	22.87

VERTICAL PLOT



VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Cable Loss	Probe Factor
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		dB	dB
1	30.000	-10.10	20.45	10.35	30.30	-19.95	Peak	0.45	20.00
2	125.060	-5.54	15.26	9.72	30.30	-20.58	Peak	0.92	14.34
3	432.550	-6.72	18.78	12.05	30.30	-18.25	Peak	1.81	16.97
4	657.590	-6.34	22.46	16.12	30.30	-14.18	Peak	2.33	20.13
5	737.130	-6.29	23.67	17.38	30.30	-12.92	Peak	2.50	21.17
6	972.840	-5.70	26.69	20.99	30.30	-9.31	Peak	3.15	23.54

7.5.2. RADIATED EMISSIONS – ABOVE 1GHz

Note: No other emissions were found up to 10th harmonic.

8/12/2005 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thanh Nguyen
Project #: 05U3560
Company: Sharp Electronics Corp.
EUT Descrip.: Microwave Oven
EUT M/N: E308075D8S, w/ Magnetron -2M253H(L), FCC ID APYDMR0166
Test Target: FCC Part 18
Mode Oper: Boiling Tap Water

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T60; S/N: 2238 @3m	T86 Miteq 924341			

Hi Frequency Cables

2 foot cable	3 foot cable	4 foot cable	12 foot cable	HPF	Reject Filter
	3_Chin		12_Thanh	HPF_2.7GHz	

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)
4.900	3.0	81.8	50.2	33.7	3.3	-44.1	-40.0	0.5	35.2	3.6	50.2	30.2	-15.0	-26.6	V
7.350	3.0	66.6	40.2	36.2	4.3	-44.4	-40.0	0.5	23.2	-3.2	50.2	30.2	-27.0	-33.4	V
9.800	3.0	75.4	46.5	38.2	5.3	-42.0	-40.0	0.7	37.6	8.7	50.2	30.2	-12.6	-21.5	V
12.250	3.0	58.3	37.8	38.4	6.1	-42.6	-40.0	0.8	21.0	0.5	50.2	30.2	-29.2	-29.7	V
14.700	3.0	48.5	34.4	39.3	6.5	-44.3	-40.0	1.0	11.0	-3.1	50.2	30.2	-39.2	-33.3	V
17.150	3.0	57.6	33.5	43.3	7.1	-44.4	-40.0	1.4	24.9	0.8	50.2	30.2	-25.3	-29.4	V
4.900	3.0	83.2	50.7	33.7	3.3	-44.1	-40.0	0.5	36.6	4.1	50.2	30.2	-13.6	-26.1	H
7.350	3.0	62.9	38.9	36.2	4.3	-44.4	-40.0	0.5	19.5	-4.5	50.2	30.2	-30.7	-34.7	H
9.800	3.0	76.7	47.4	38.2	5.3	-42.0	-40.0	0.7	38.9	9.6	50.2	30.2	-11.3	-20.6	H
12.250	3.0	57.6	37.6	38.4	6.1	-42.6	-40.0	0.8	20.3	0.3	50.2	30.2	-29.9	-29.9	H
14.700	3.0	53.5	36.1	39.3	6.5	-44.3	-40.0	1.0	16.0	-1.4	50.2	30.2	-34.2	-31.6	H
17.150	3.0	62.3	38.1	43.3	7.1	-44.4	-40.0	1.4	29.6	5.4	50.2	30.2	-20.6	-24.8	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		

7.6. CONDUCTED EMISSIONS

LIMIT

§18.307 For the following equipment, when designed to be connected to the public utility (AC) power line the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies shall not exceed the limits in the following tables. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal using a 50 µH/50 ohms line impedance stabilization network (LISN).

(b) All other part 18 consumer devices:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

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	4/18/05	05U3347-1	☒

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

RESULTS

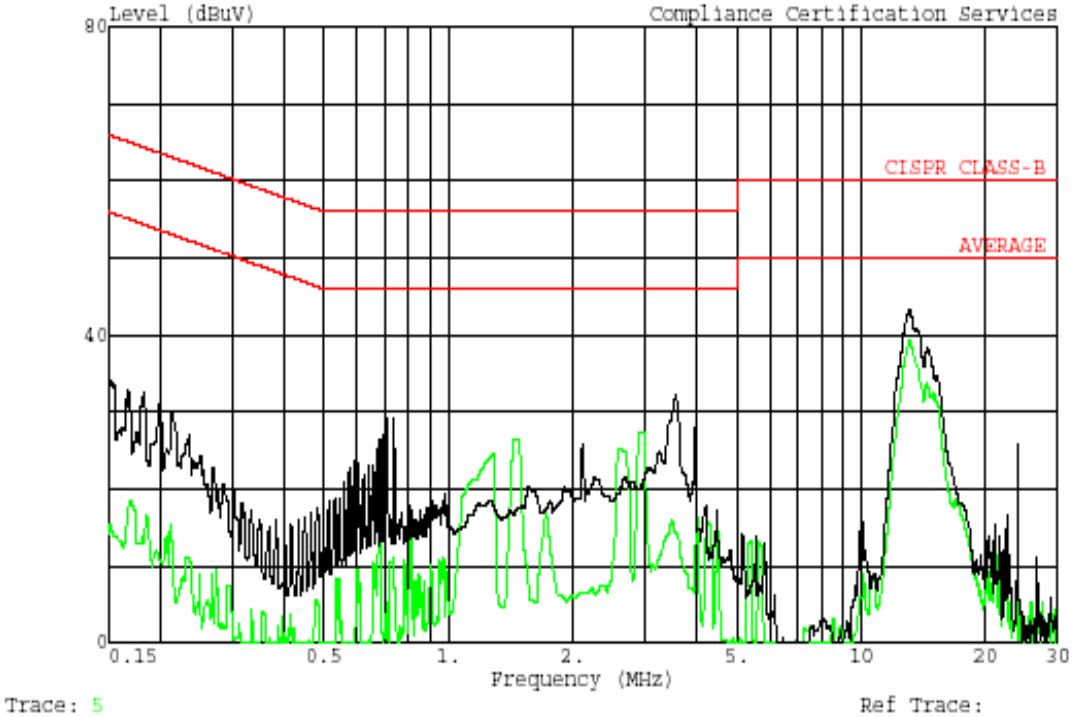
No non-compliance noted:

6 WORST EMISSIONS:

CONDUCTED EMISSIONS DATA (240VAC 60Hz)									
Freq.	Reading			Closs	Limit	FCC_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.89	56.84	29.10	24.55	0.00	56.00	46.00	-26.90	-21.45	L1
3.57	51.86	32.34	25.01	0.00	56.00	46.00	-23.66	-20.99	L1
13.55	51.56	43.30	27.48	0.00	60.00	50.00	-16.70	-22.52	L1
0.91	60.88	32.20	17.10	0.00	56.00	46.00	-23.80	-28.90	L2
3.57	52.98	41.72	28.52	0.00	56.00	46.00	-14.28	-17.48	L2
12.99	50.38	46.54	38.35	0.00	60.00	50.00	-13.46	-11.65	L2
6 Worst Data									

LINE 1

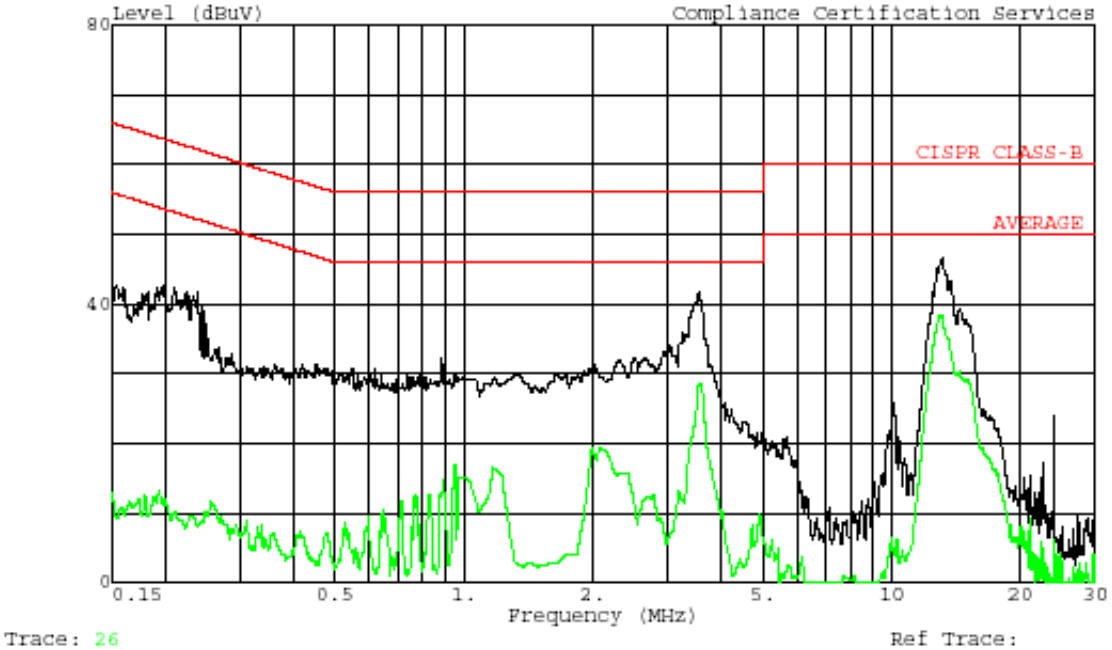
561F Monterey Road
Morgan Hill, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888



Trace: 5 Ref Trace:
Project No. : 05U3560
Test Engr : Thanh Nguyen
Company : Sharp Electronics Corp.
EUT : MicroWave Oven
Model No. : E30S075DSS, S/N 7G53006092
Test Config. : EUT Only
Mode of Op. : Normal Operation, Heat up water w/High
: Power.
Target of Test: CISPR22 Class B
Power Mains : 240 VAC / 60 Hz
: L1 : QP(Black); AVG(Green)

LINE 2

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



Trace: 26 Ref Trace:
Project No. : 05U3560
Test Engr : Thanh Nguyen
Company : Sharp Electronics Corp.
EUT : MicroWave Oven
Model No. : E30SO75DSS, S/N 7G53006092
Test Config. : EUT Only
Mode of Op. : Normal Operation, Heat up water w/High
: Power.
Target of Test: CISPR22 Class B
Power Mains : 240 VAC / 60 Hz
: L2 : QP(Black); AVG(Green)

8. SETUP PHOTO

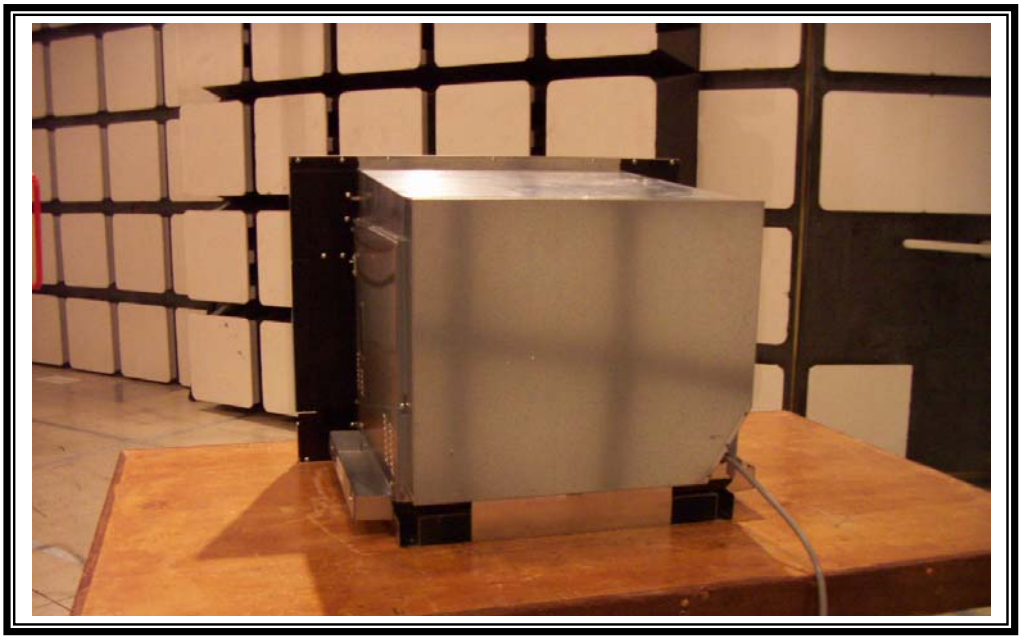
Radiation Hazard Measurement

Operating Frequency Measurements

AC Line Conduction Front

AC Line Conduction back

Radiation Measurement front



Radiation Measurements back

END OF REPORT