



**FCC CFR47 PART 18 SUBPART C**

**CERTIFICATION TEST REPORT**

**FOR**

**MICROWAVE OVEN**

**MODEL NUMBER: KB6525PS**

**FCC ID: APYDMR0173**

**REPORT NUMBER: 08U12317-1A**

**ISSUE DATE: JANUARY 13, 2009**

*Prepared for*

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

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES  
47173 BENICIA STREET  
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**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	12/22/08	Initial Issue	T. Chan
A	01/13/09	Per client's request revised model number	A. Zaffar



# 1. ATTESTATION OF TEST RESULTS

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

**EUT DESCRIPTION:** MICROWAVE OVEN

**MODEL:** KB6525PS

**SERIAL NUMBER:** 142374

**DATE TESTED:** DECEMBER 16 - 19, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 18 SUBPART C	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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

TOM CHEN  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC Part 18 Subpart C and FCC / OST MP-5, "FCC Method 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 47173 Benicia Street, Fremont, California, USA.

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
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Microwave Oven sold for consumer use with Maximum power 1200W.

#### GENERAL INFORMATION

<b>CHASSIS MATERIAL</b>	METAL
<b>POWER REQUIREMENTS</b>	120VAC / 60 Hz
<b>MAGNETRON MODEL</b>	TOSHIBA, 2M240J (L)

### 5.2. MODE(S) OF OPERATION

Mode	Description
Normal	Boiling water with maximum power

### 5.3. MODIFICATIONS

No modifications were made during testing.

## 5.4. DETAILS OF TESTED SYSTEM

### SUPPORT EQUIPMENT

The EUT is stand-alone unit.

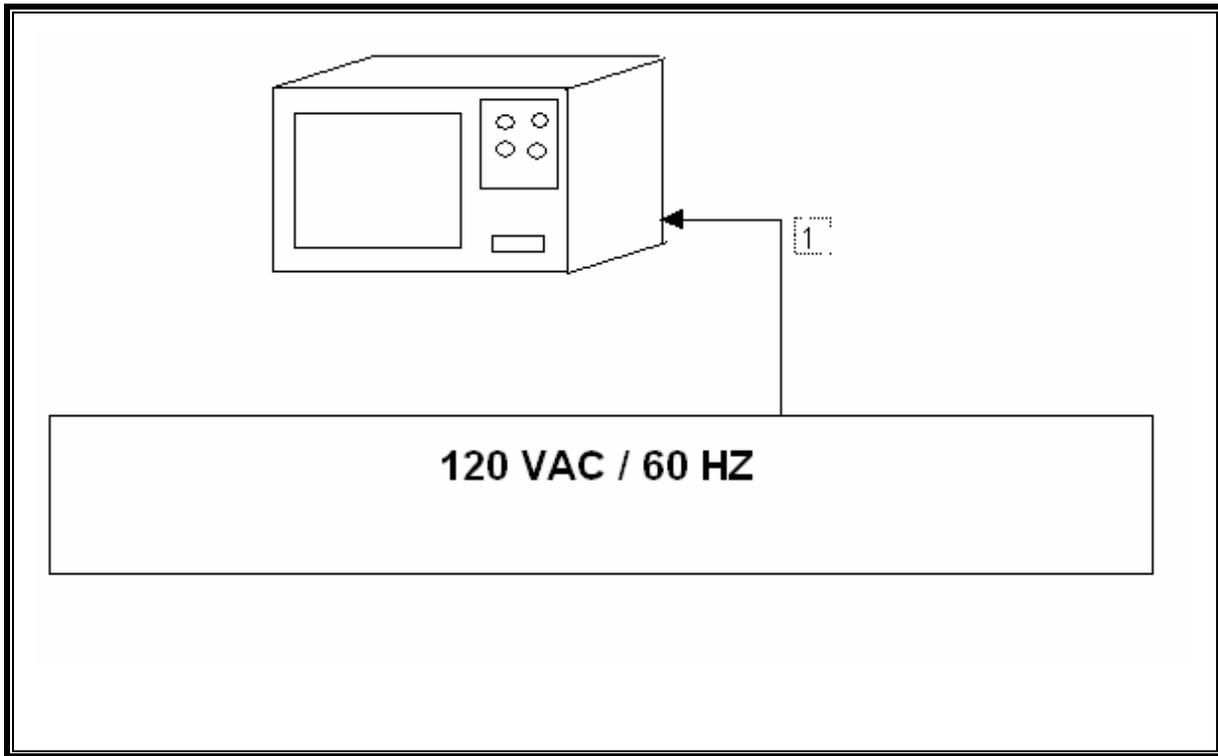
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	UNSHIELDED	.8m	

### TEST SETUP

The EUT is stand-alone unit.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	09/19/09
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	09/20/09
30MHz_2.9GHz Bilog Antenna	Sunol Sciences	JB1	C01011	03/02/09
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	03/31/09
Antenna, Horn, 18 GHz	EMCO	3115	C00945	04/22/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/03/09
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	03/03/09
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/09
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	10/25/09
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	06/23/09
Digital Power Analyzer	Valhalla	2111A	NA	01/19/10
Microwave Leakage Tester	Simpson	380-2	N02614	CNR
Ajustable Power Supply	The Superior Electric Co.	Powerstat	NA	CNR

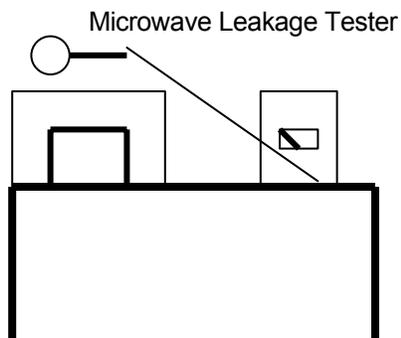
## 7. APPLICABLE LIMITS AND TEST RESULTS

### 7.1. RADIO NOISE EMISSION MEASUREMENTS

#### 7.1.1. RADIATION HAZARD MEASUREMENT

##### 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.



##### LIMIT

FCC / OST MP-5: SECTION 3.1 ( $< 1.0\text{mW/cm}^2$ )

**RESULTS**



Maximum leakage 0.15

	Maximum Leakage (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Figure shown above for the location of maximum leakage	0.09	1.00
All Others	0.03	1.00

## 7.1.2. INPUT POWER

### 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 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.

### LIMIT

FCC / OST MP-5: SECTION 4.3

Reporting: Input Power = Input Voltage \* input current

### RESULTS

#### Input Power

Input Voltage (Vac)	Input Current (Amps)	Input Power (Watts)
115	15.4	1771.00

### 7.1.3. OUTPUT POWER

#### TEST PROCEDURE

The Caloric Method was used to determine maximum output power. The initial temperature of a 1000-ml water load was measured for ovens rated at 1000 watts or less power output. For ovens more than 1000 watts output, additional beakers by fraction thereof are used if necessary.

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.

#### LIMIT

FCC / OST MP-5: SECTION 4.3

Reporting: Output power should be applied to the out-of-band emissions limit with the formula of  $25\sqrt{\text{Power}/500}$  @ 300m.

#### RESULTS

##### Output Power

Start Temperature (°C)	Final Temperature (°C)	Elapsed Time (120 Sec)	Water Volume (ml)	RF Power (Watts)
19.2	41.3	120.00	1000.00	773.50
18.9	42.8	120.00	1000.00	836.50
18.8	44.1	120.00	1000.00	885.50

**Average of 3 Trials: 831.83 Watts**

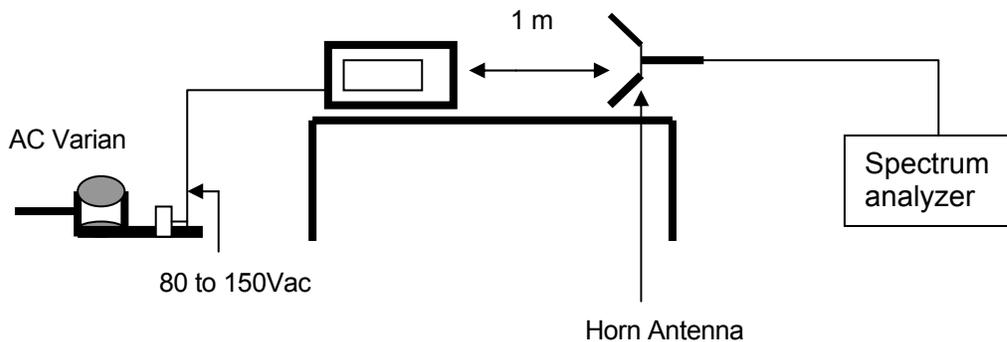
Output Power =  $((4.2 \text{ Joules/Cal}) \times (\text{Volume in ml}) \times (\text{Temp. Rise})) / \text{Time in Seconds}$

### 7.1.4. OPERATING FREQUENCY WITH TIME

#### TEST PROCEDURE

The Caloric Method was used to determine maximum output power. The initial temperature of a 1000-ml water load was measured for ovens rated at 1000 watts or less power output. For ovens more than 1000 watts output, additional beakers by fraction thereof are used if necessary.

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



#### LIMIT

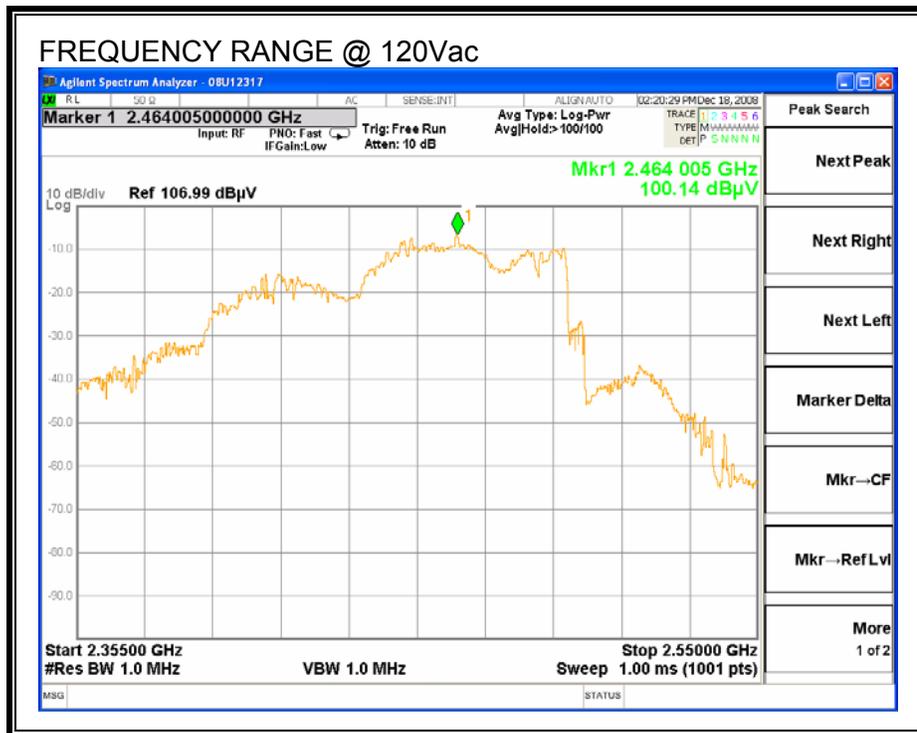
FCC / OST MP-5: SECTION 4.3

The frequency range shall lie within the band 2.4 GHz to 2.5 GHz from the peak ( $f_L > 2.4$  GHz and  $f_H < 2.5$  GHz) over Normal condition.

#### RESULTS

Condition	Frequency (MHz)
Normal	2464.0

**VARIATION IN OPERATING FREQUENCY WITH TIME**

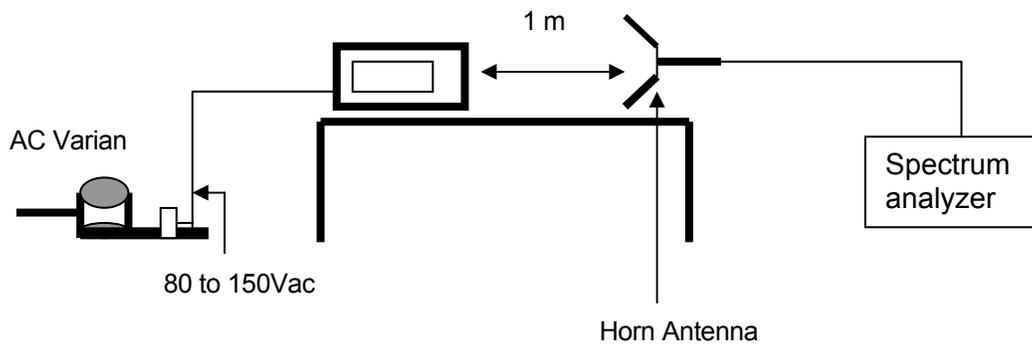


### 7.1.5. OPERATING FREQUENCY WITH VOLTAGE

#### TEST PROCEDURE

The Caloric Method was used to determine maximum output power. The initial temperature of a 1000-ml water load was measured for ovens rated at 1000 watts or less power output. For ovens more than 1000 watts output, additional beakers by fraction thereof are used if necessary.

The fundamental operating frequency was monitor until the water load was reduced to 20% of the original load, and the operating frequency was monitored as the input voltage was varied between 80 to 125 percent of the nominal rating.



#### LIMIT

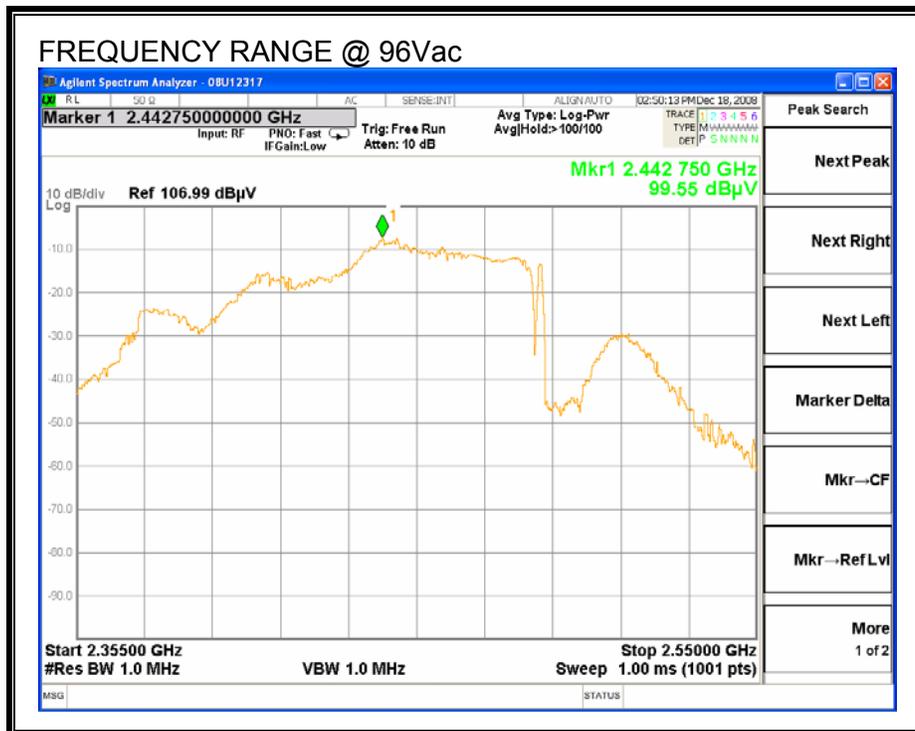
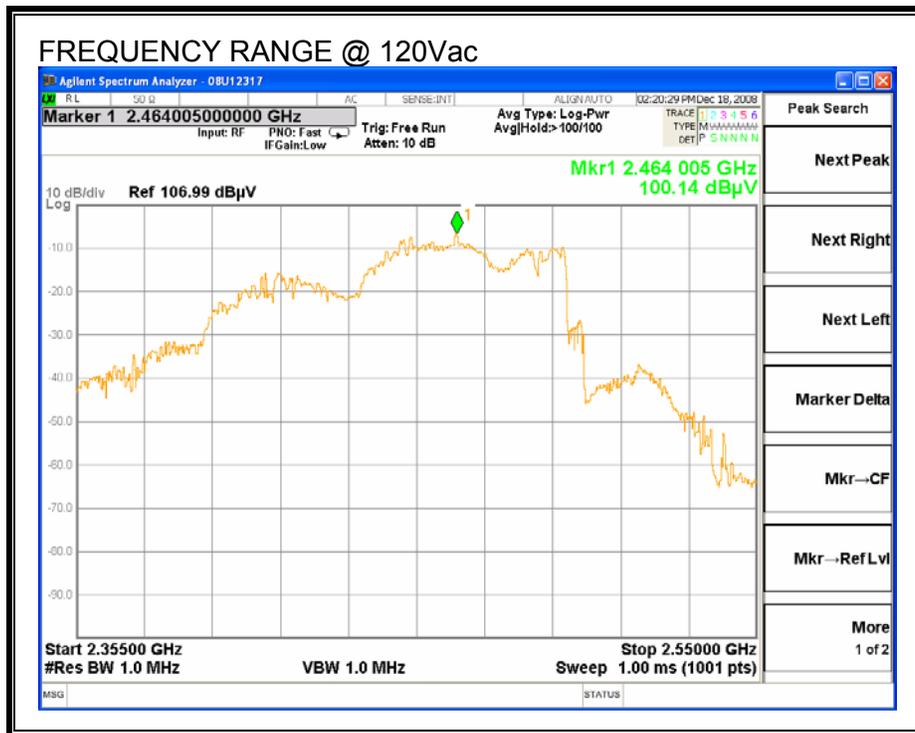
FCC / OST MP-5: SECTION 4.3

The frequency range shall lie within the band 2.4 GHz to 2.5 GHz of -20dBc from the peak ( $f_L > 2.4 \text{ GHz}$  and  $f_H < 2.5 \text{ GHz}$ ) over Normal and Extreme voltages condition.

#### RESULTS

Condition	Frequency (MHz)
Normal	2464.0
Extreme V low (96Vac)	2442.8
Extreme V high (150Vac)	2460.5

**VARIATION IN OPERATING FREQUENCY WITH VOLTAGE**





### 7.1.6. RADIATED EMISSIONS

#### TEST PROCEDURE

FCC / OST MP-5

The fundamental clock frequency generated or used in the EUT is 2,450 MHz; therefore the frequency range was investigated from 30 MHz to 10<sup>th</sup> harmonic.

Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and other of 300 milliliters of water are used.

#### LIMIT

§18.305 (b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency Distance	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency ....	Below 500	25	300
	Any non-ISM frequency ....	500 or more	$25 \times \text{SQRT}(\text{power}/500)$	300

#### RESULTS

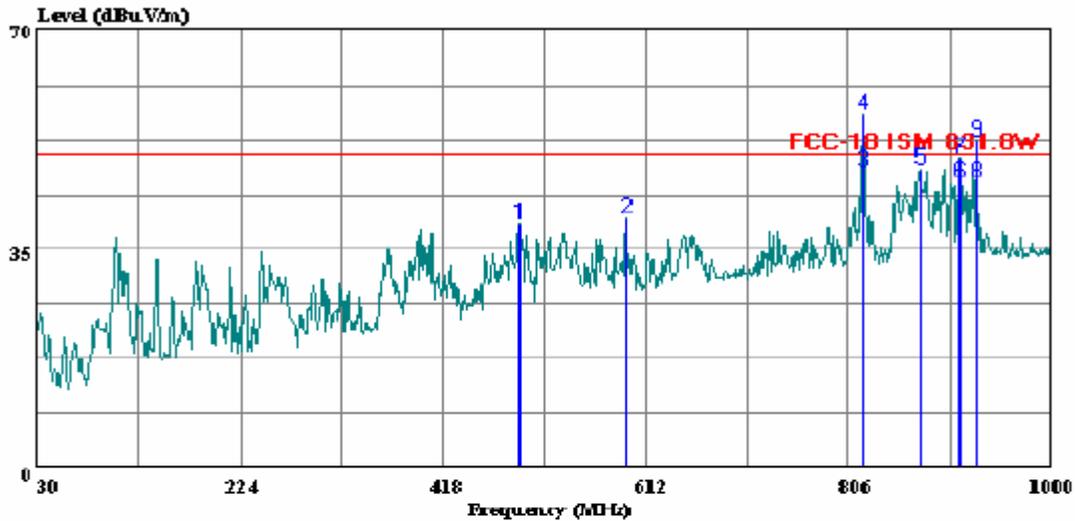
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



Compliance Certification Services  
 47173 Benicia Street  
 Fremont, CA 94538  
 Tel: (510) 771-1000  
 Fax: (510) 661-0888

Data#: 12 File#: 08u12317.emi Date: 12-23-2008 Time: 15:42:04



Trace: 1

Ref Trace:

Condition: HORIZONTAL  
 Test Operator:: Tom Chen  
 Project #: : 08U12317  
 Company: : Sharp Manufacturing Company of America  
 Configuration:: EUT and small bucket of water  
 Mode : : Boiling 1000 mL of water  
 Target: : FCC Part 18

Page: 1

	Freq	Read	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	490.750	44.00	-5.05	38.95	50.20	-11.25	Peak
2	592.600	43.00	-3.00	40.00	50.20	-10.20	Peak
3	820.550	46.61	1.11	47.72	50.20	-2.48	QP
4 *	820.550	55.67	1.11	56.77	50.20	6.57	Peak
5	873.900	45.67	2.34	48.01	50.20	-2.19	Peak
6	912.700	42.83	3.01	45.84	50.20	-4.36	QP
7	912.700	46.67	3.01	49.68	50.20	-0.52	Peak
8	928.220	42.73	3.17	45.90	50.20	-4.30	QP
9 *	928.220	49.17	3.17	52.33	50.20	2.13	Peak

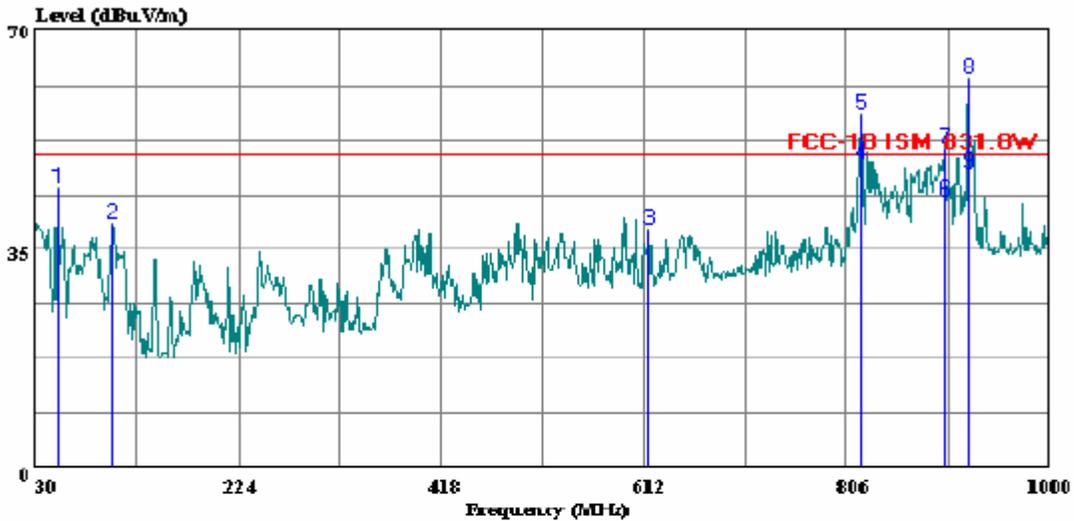
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

VERTICAL PLOT



Compliance Certification Services  
 47173 Benicia Street  
 Fremont, CA 94538  
 Tel: (510) 771-1000  
 Fax: (510) 661-0888

Data#: 10 File#: 08u12317.emi Date: 12-23-2008 Time: 15:26:10



Trace: 3

Ref Trace:

Condition: VERTICAL  
 Test Operator:: Tom Chen  
 Project #: 08U12317  
 Company: Sharp Manufacturing Company of America  
 Configuration:: EUT and small basket of water  
 Mode : Boiling 1000 mL of water  
 Target: FCC Part 18

Page: 1

	Freq	Read	Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	50.370	64.17	-19.36	44.81	50.20	-5.39	Peak
2	103.720	54.83	-15.66	39.18	50.20	-11.02	Peak
3	616.850	40.50	-2.43	38.07	50.20	-12.13	Peak
4	820.550	47.83	1.11	48.94	50.20	-1.26	QP
5 *	820.550	55.67	1.11	56.77	50.20	6.57	Peak
6	899.120	39.84	2.95	42.78	50.20	-7.42	QP
7 *	899.120	48.36	2.95	51.31	50.20	1.11	Peak
8 *	922.400	59.33	3.13	62.46	50.20	12.26	Peak
9	922.440	44.00	3.13	47.13	50.20	-3.07	QP

**SPURIOUS EMISSIONS ABOVE 1GHz (WORST-CASE CONFIGURATION)**

### HIGH FREQUENCY ABOVE 1GHz

High Frequency Measurement  
 Compliance Certification Services, Fremont 5m Chamber

Company: Sharp  
 Project #: 08U12317-1  
 Date: 12/19/2008  
 Test Engineer: Tom Chen  
 Configuration: EUT Only  
 Mode: Boiling water with Max Power

**Test Equipment:**

Horn 1-18GHz	Pre-amplifer 1-2	Pre-amplifer 26-	Horn > 18GHz	Limit
T73; S/N: 6717 @	T145 Agilent 300			FCC 18

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Fil	Output Power (W)
		B-5m Chamber		R_001	831.8

f GHz	Dist (m)	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Avg dBuV/m	Avg Lim dBuV/m	Avg Mar dB	Notes (V/H)
<b>Without Preamp. Without Filter</b>											
2.400	3.0	27.8	29.3	5.1	0.0	-40.0	0.0	22.2	30.2	-8.0	V
2.500	3.0	25.6	29.5	5.1	0.0	-40.0	0.0	20.3	30.2	-9.9	V
2.400	3.0	24.8	29.3	5.1	0.0	-40.0	0.0	19.2	30.2	-11.0	H
2.500	3.0	24.6	29.5	5.1	0.0	-40.0	0.0	19.3	30.2	-10.9	H
<b>With Preamp. With Filter</b>											
4.925	3.0	37.3	33.9	7.2	-34.9	-40.0	0.2	3.7	30.2	-26.4	V
7.375	3.0	39.1	36.3	8.7	-34.6	-40.0	0.2	9.5	30.2	-20.6	V
9.819	3.0	33.6	38.0	10.1	-35.0	-40.0	0.2	6.8	30.2	-23.3	V
14.788	3.0	32.2	40.9	12.7	-32.4	-40.0	0.2	13.6	30.2	-16.6	V
4.910	3.0	38.2	33.8	7.2	-34.9	-40.0	0.2	4.6	30.2	-25.6	H
7.372	3.0	37.4	36.3	8.7	-34.6	-40.0	0.2	7.9	30.2	-22.2	H
9.833	3.0	34.1	38.0	10.1	-35.1	-40.0	0.2	7.3	30.2	-22.8	H
14.750	3.0	33.4	40.9	12.7	-32.4	-40.0	0.2	14.7	30.2	-15.5	H

Rev. 4.12.7

## 7.2. AC MAINS LINE CONDUCTED EMISSIONS

### TEST PROCEDURE

FCC / OST MP-5

### LIMIT

§ FCC 18.307 (a) Except for Class A digital devices, for equipment that is 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 within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). 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. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

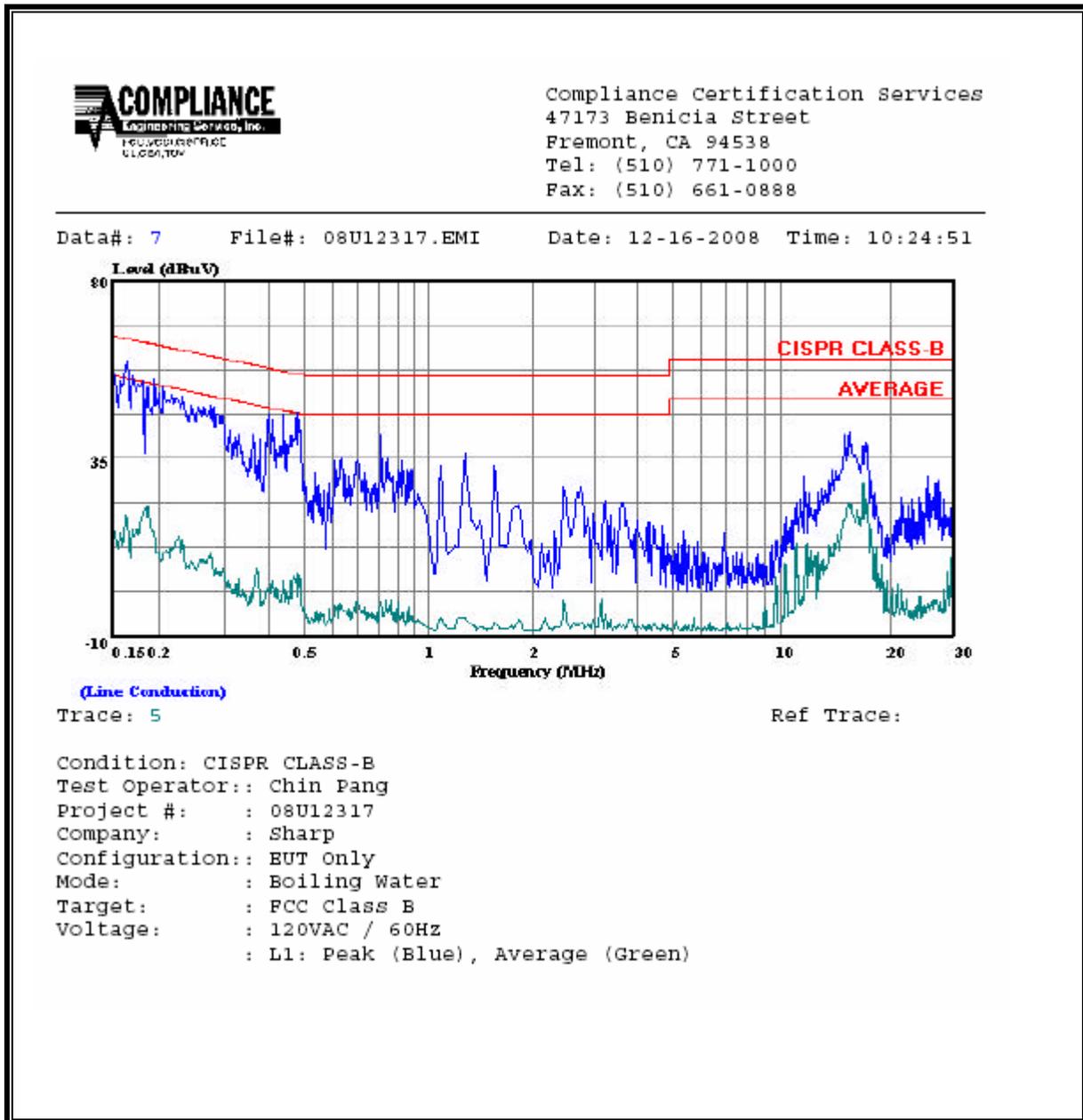
Notes:  
1. The lower limit shall apply at the transition frequencies  
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### RESULTS

**6 WORST EMISSIONS**

CONDUCTED EMISSIONS DATA (120VAC 60Hz)									
Freq.	Reading			Class	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.17	59.64	--	22.54	0.00	65.21	55.21	-5.57	-32.67	L1
0.48	46.61	--	6.02	0.00	56.41	46.41	-9.80	-40.39	L1
15.55	41.80	--	20.54	0.00	60.00	50.00	-18.20	-29.46	L1
0.24	38.27	--	22.98	0.00	62.17	52.17	-23.90	-29.19	L2
0.93	37.85	--	-2.70	0.00	56.00	46.00	-18.15	-48.70	L2
17.29	46.46	--	31.14	0.00	60.00	50.00	-13.54	-18.86	L2
6 Worst Data									

**LINE 1 RESULTS**

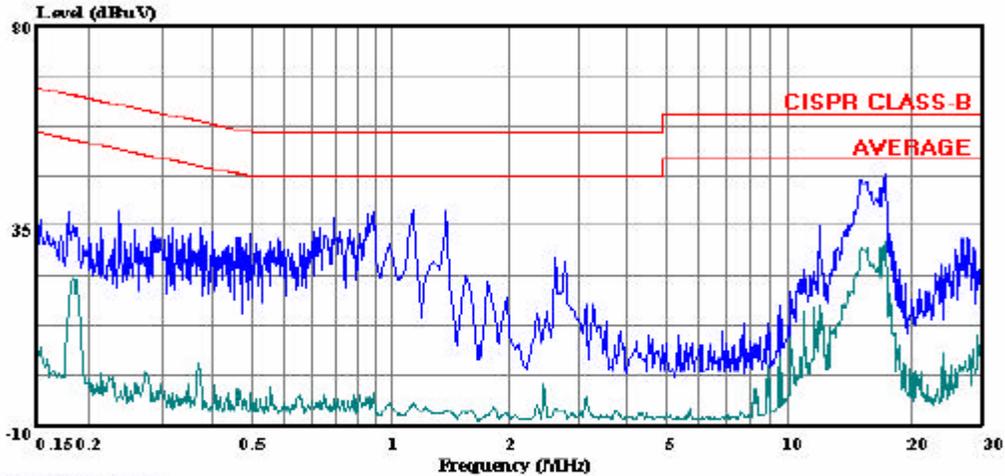


**LINE 2 RESULTS**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 14 File#: 08U12317.EMI Date: 12-16-2008 Time: 10:31:06



(Line Conduction)

Trace: 12

Ref Trace:

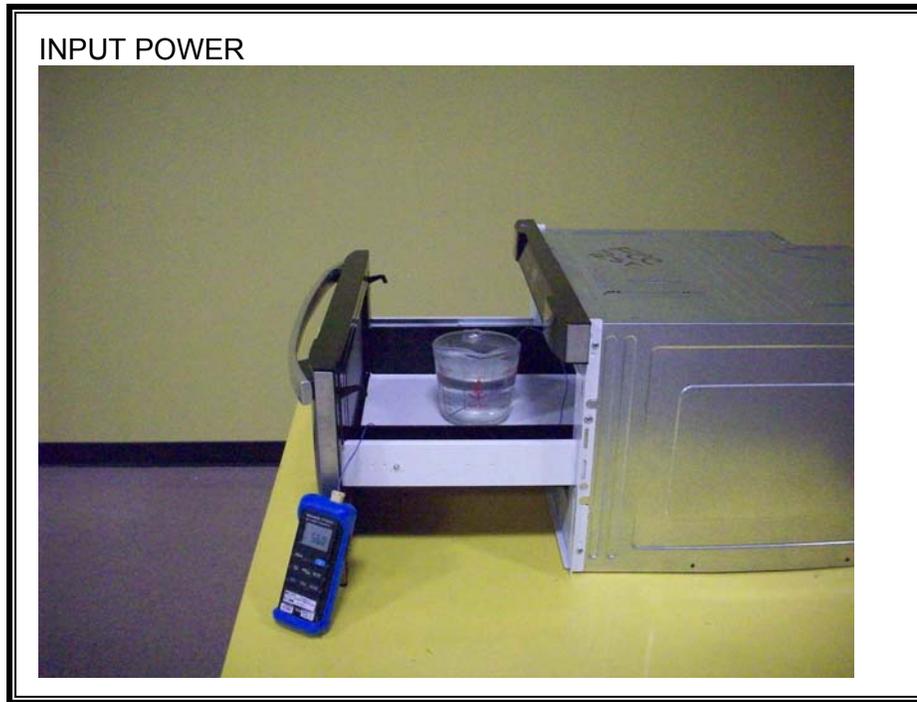
Condition: CISPR CLASS-B  
Test Operator:: Chin Pang  
Project #: : 08U12317  
Company: : Sharp  
Configuration:: BUT Only  
Mode: : Boiling Water  
Target: : FCC Class B  
Voltage: : 120VAC / 60HZ  
: L2: Peak (Blue), Average (Green)

## 8. SETUP PHOTOS

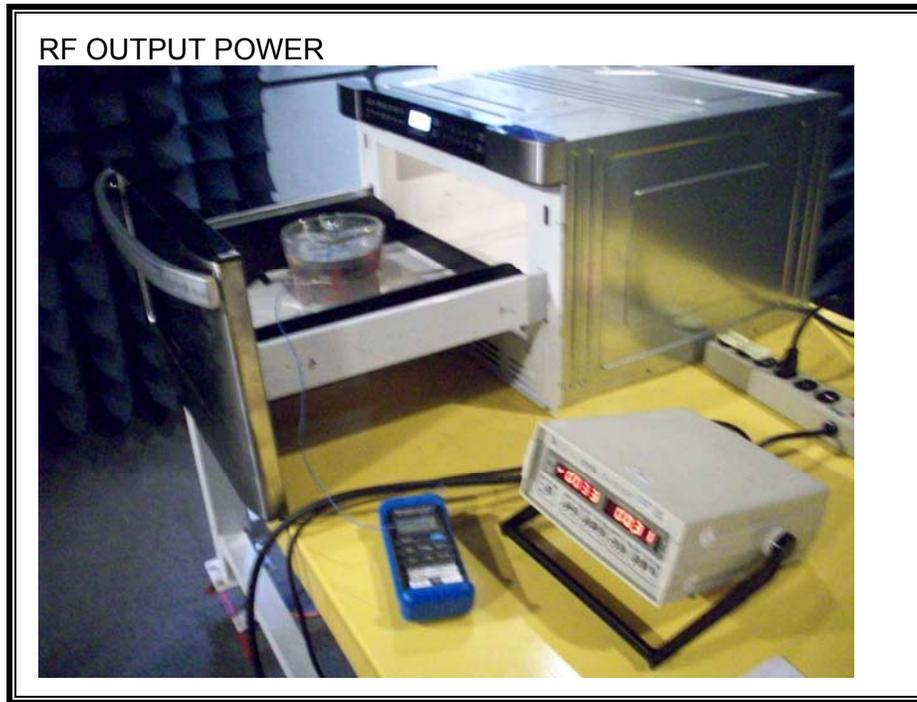
### RADIATED HAZARD EMISSIONS



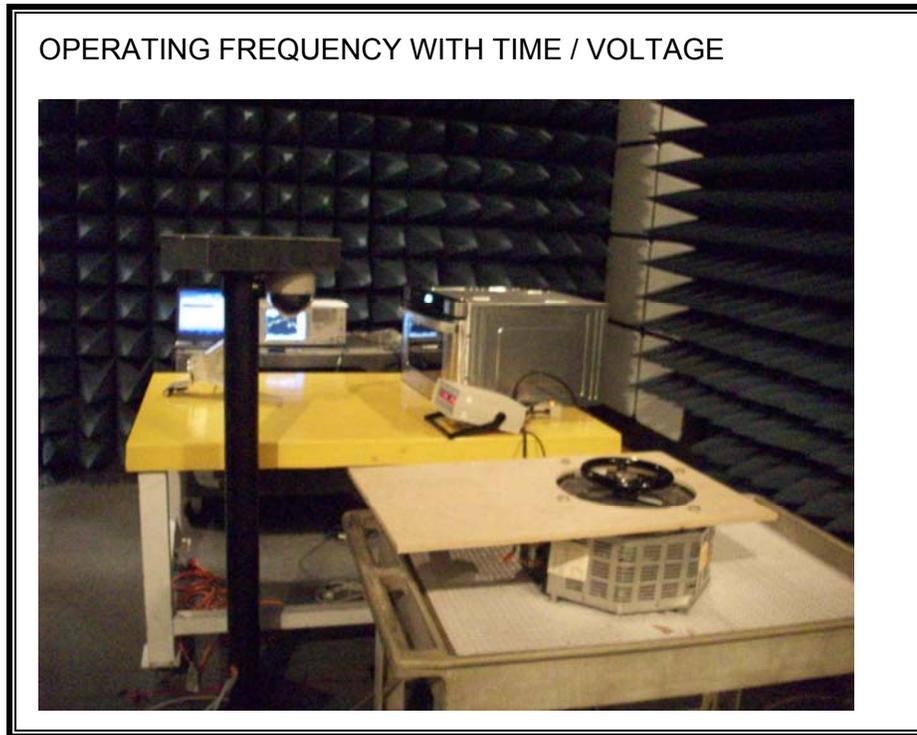
**INPUT POWER**



**RF OUTPUT POWER**



**OPERATING FREQUENCY WITH TIME / VOLTAGE**



**RADIATED EMISSION**





**AC MAINS LINE CONDUCTED EMISSION**





**END OF REPORT**