APPLICATION FOR CERTIFICATION On Behalf of Tsann Kuen Enterprise Co., Ltd.

Microwave Oven

Model: TSK-8402AMM (WST3500)

FCC ID: RBJ-TSK840XA

Prepared for : Tsann Kuen Enterprise Co., Ltd.
3, Kai Fa 2nd Road, Pao An Industrial District,

Ren Teh Hsiang, Tainan, Taiwan

Prepared By: Audix Corporation

Technical Division EMC Department No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.

Tel: (02) 2609-9301, 2609-2133

Fax: (02) 2609-9303

File Number EM-G921077 Report Number **TTEMC-F92208** Date of Test Oct. 17 ~ 18, 2003 Date of Report : Oct. 23, 2003

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TEST REPORT CERTIFICATION

Applicant : Tsann Kuen Enterprise Co., Ltd.

Manufacturer : Tsann Kuen (Zhangzhou) Enterprise Co., Ltd.

EUT Description : Microwave Oven FCC ID : RBJ-TSK840XA

(A) MODEL NO. : TSK-8402AMM (WST3500)

(B) SERIAL NO. : N/A

(C) POWER SUPPLY: AC 120V, 60Hz

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 18 SUBPART C, OCT 1999 AND FCC/OST MP-5 FEBRUARY 1986

The device described above was tested by Audix Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 18 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and Audix Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Corporation.

Date of Test: Oct. 17 ~ 18, 2003

Prepared by: Mynica Chang Oct. >7 >003

(Monica Chang/Assistant)

Test Engineer: fln (lend Od), so

(Ben Cheng/Assistant Manager)

Approve & Authorized Signer:

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description : Microwave Oven

Model Number : TSK-8402AMM (WST3500)

FCC ID : RBJ-TSK840XA

Applicant : Tsann Kuen Enterprise Co., Ltd.

3, Kai Fa 2nd Road, Pao An Industrial District,

Ren Teh Hsiang, Tainan, Taiwan

Manufacturer : Tsann Kuen (Zhangzhou) Enterprise Co., Ltd.

Pancuo Village, Jiaomei Town, Longhai City,

Zhangzhou, Fujian, China

Frequency : 2450MHz

Rated Current : 8.5A

Microwave Output : 700W

Rated Power Consumption : 1150W

Power Cord : Non-Shielded, Undetachable, 1.0m

Date of Receipt of Sample : Oct. 14, 2003

Date of Test : Oct. $17 \sim 18,2003$

1.2. Description of Test Facility

Name of Firm : Audix Corporation

Technical Division EMC Department No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.

Test Site : Semi-Anechoic Chamber

Federal Communication Commission

Registration Number: 90993 Filing on May 16, 2003

No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab. Code : 200077-0

(NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.3. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test	30MHz~300MHz	+4.26dB / -4.22dB
(Distance: 3m)	300MHz~1000MHz	+5.28dB / -4.0dB

Remark: Uncertainty = $ku_c(y)$

2. INPUT POWER MEASUREMENT

2.1. Test Equipment

The following test equipment was used during the input power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Universal Power	Voltech	PM3000A	6686-002	Jan. 21, 03'	Jan. 20, 04'
	Analyzer					

2.2. Test Setup

2.2.1. Block Diagram of connection between EUT and simulators

MICROWAVE OVEN (EUT)

2.2.2. Block Diagram of connection between EUT and test equipment

EUT	UNIVERSAL POWER ANALYZER
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2.3. Operating Condition of EUT and Measurement Procedure

The input power was measured using a universal power analyzer. 700 milliliters of water in the beaker was placed in the center of the Microwave Oven (EUT). The Microwave Oven (EUT) was operated at the rated input and full output power for 6 minutes.

2.4. Measurement Results

EUT: Microwave Oven M/N: TSK-8402AMM (WST3500)

Test Date: Oct. 17, 2003 Temperature: 18 Humidity: 47%

Load: 700ml

	Measured	Manufac	cturer's Input	
Voltage (Vac)	Current (A)	Current (A)	Input Power (W)	
118.86	9.69	1071	8.5A	1150W

3. OUTPUT POWER MEASUREMENT

3.1. Test Equipment

None.

3.2. Test Setup

MICROWAVE OVEN (EUT)

3.3. Operating Condition of EUT and Measurement Procedure

The Calorimetric Method was used to determine maximum output power. 1000 milliliters of water in the beaker was placed in the center of the Microwave Oven (EUT). A mercury thermometer was used to measure temperature rise.

3.4. Measurement Results

EUT: Microwave Oven M/N: TSK-8402AMM (WST3500)

Test Date: Oct. 17, 2003 Temperature: 18 Humidity: 47%

Load: 1000ml Manufacture's Output: 700W

Load	Initial Water Temperature	Final Water Temperature	Heating Duration (Sec.)
1000ml	8	26	120

Power [W] =
$$\frac{4.2 \times 1000 \times 18}{120} = 630W$$

4. OUTPUT FREQUENCY MEASUREMENT

4.1. Test Equipment

The following test equipment was used during the input power measurement:

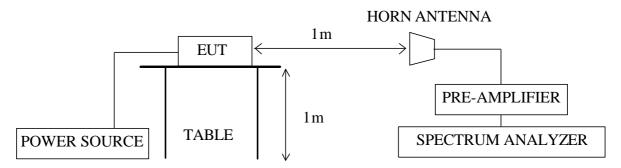
		1 1				
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 24, 03'	Sep. 23, 04'
2.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03'	Apr. 20, 04'
3.	Pre-Amplifier	HP	8449B	3008A00529	Jan. 07, 03'	Jan. 06, 04'

4.2. Test Setup

4.2.1. Block Diagram of connection between EUT and simulators

MICROWAVE OVEN (EUT)

4.2.2. Block Diagram of connection between EUT and test equipment



4.3. Operating Condition of EUT and Measurement Procedure

The fundamental frequency was measured using a spectrum analyzer. The Microwave Oven (EUT) was operated in "Power-High" mode and without load.

4.4. Measurement Results

EUT: Microwave Oven M/N: TSK-8402AMM (WST3500)

Test Date: Oct. 17, 2003 Temperature: 18 Humidity: 47%

Load: No Load

Measured Frequency (MHz)	Manufacture's Rated Frequency
2463.5	2450

5. FREQUENCY MEASUREMENT

5.1. Test Equipment

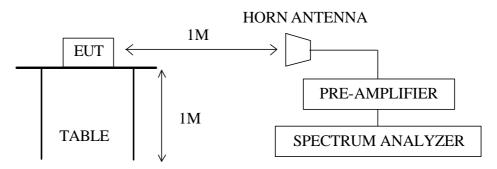
The following test equipment was used during the input power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 24, 03'	Sep. 23, 04'
2.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 13, 03'	Mar. 12, 04'
3.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03'	Apr. 20, 04'

5.2. Test Setup

5.2.1. Block Diagram of connection between EUT and simulators

5.2.2. Block Diagram of connection between EUT and test equipment



5.3. Operating Condition of EUT and Measurement Procedure

5.3.1. The Variation of frequency with time

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, 1000 milliliters of water in the beaker was placed in the center of the Microwave Oven (EUT) and the EUT was operated at maximum output power.

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

5.3.2. The Variation of frequency for line 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 1000ml for the duration of the test.

5.4. Measurement Results

PASSED. All the test results are listed in the following and next two pages.

EUT: Microwave Oven M/N: TSK-8402AMM (WST3500)

Test Date: Oct. 17, 2003 Temperature: 18 Humidity: 47%

5.4.1. The Variation of frequency with time

Frequency was measured at the rated input voltage (AC 120V).

Initial Load: 1000ml Final Load: 200ml

Fundamental Frequency: 2450MHz

Limit: 2.4GHz < f < 2.5GHz

Maximum Frequency Observed: 2453MHz Minimum Frequency Observed: 2445MHz

Results: PASSED.

5.4.2. The Variation of frequency for line voltage

Variation of line voltage from 80% (96V) to 125% (150V)

Load: 1000ml

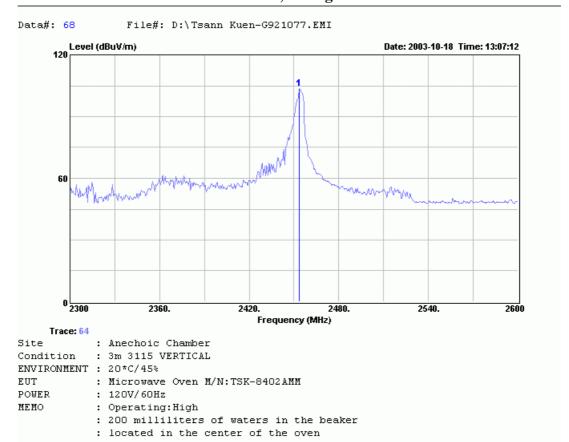
Fundamental Frequency: 2450MHz

Limit: 2.4GHz < f < 2.5GHz

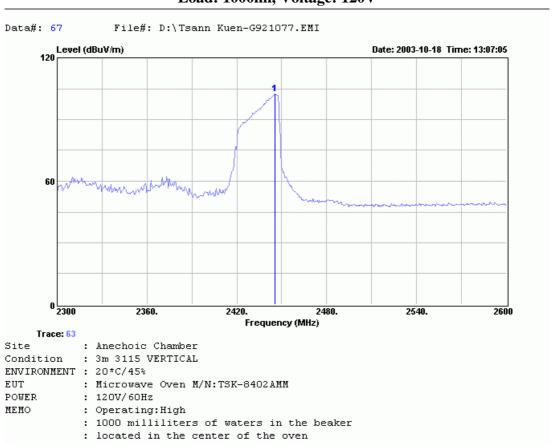
Maximum Frequency Observed: 2459MHz Minimum Frequency Observed: 2447MHz

Results: PASSED.

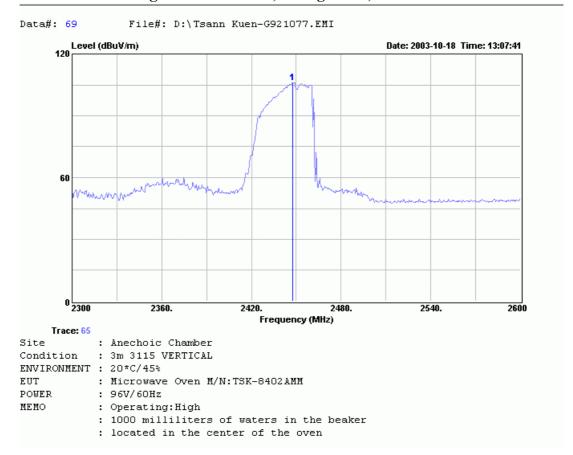
Load: 200ml, Voltage: 120V



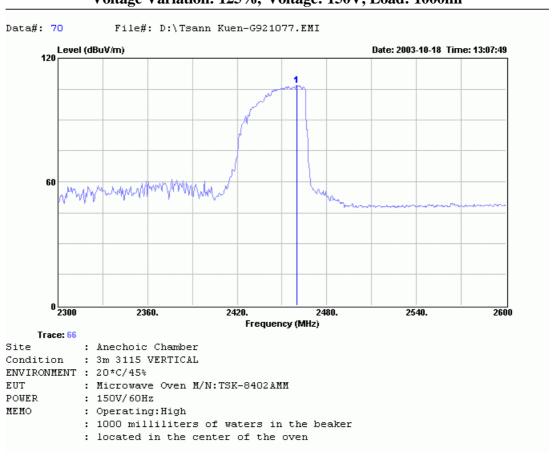
Load: 1000ml, Voltage: 120V



Voltage Variation: 80%, Voltage: 96V, Load: 1000ml



Voltage Variation: 125%, Voltage: 150V, Load: 1000ml



6. RADIATED EMISSION TEST

6.1. Test Equipment

The following test equipment was used during the radiated emission tests:

6.1.1. Below 1GHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 24, 03'	Sep. 23, 04'
2.	Test Receiver	R&S	ESVP	893202/001	Jul. 09, 03'	Jul. 08, 04'
3.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 13, 03'	Mar. 12, 04'
4.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Feb. 23, 03°	Feb. 22, 04°
5.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0138	Feb. 23, 03°	Feb. 22, 04°

6.1.2. Above 1GHz (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 24, 03'	Sep. 23, 04'
2.	Pre-Amplifier	HP	8449B	3008A00529	Jan. 07, 03'	Jan. 06, 04'
3.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03'	Apr. 20, 04'
4.	For Above 3.5GHz	HP	84300-80038	005	Dec. 04, 02'	Dec. 03, 03'
	- High Pass Filter					

6.2. Test Setup

6.2.1. Block Diagram of connection between EUT and simulators

MICROWAVE OVEN (EUT)

6.2.2. Semi-Anechoic Chamber (3m) Setup Diagram

ANTENNA TOWER ANTENNA ELEVATION VARIES FROM 1m TO 4m 3 METERS EUT O.8M TURN TABLE GROUND PLANE

6.3. Radiation Limits

The radiated limits of the Microwave Oven (EUT) are complied with FCC CFR Title 47 Part 18 Subpart C & MP-5. The limits are calculated as below: Calculated formula:

$$\begin{split} & \text{Limit } (E_{300\text{m}}) = 25 \, * \, (Power \, / \, 500)^{\, 1/2} \, (\mu\text{V/m}) \\ & E_{3\text{m}} = E_{300\text{m}} \, / \, K \\ Power \, Output = 630 \, W \\ & \text{Limit } (E_{300\text{m}}) = 25 \, * \, (630 \, / \, 500)^{\, 1/2} \, (\mu\text{V/m}) = 28.06 (\mu\text{V/m}) \\ & E_{3\text{m}} = 28.06 \, / \, 6.9 \, * \, 10^{-3} = 4066.66 (\mu\text{V/m}) \\ 20log(4066.66) = 72 (dB \mu\text{V/m}) \end{split}$$

6.4. Operating Condition of EUT

- 6.4.1. Setup the EUT and simulator as shown on 6.2.
- 6.4.2. Turned on the power of all equipment.
- 6.4.3. The beaker with two loads (700ml &300ml) and two locations (center & right front corner) was placed into the Microwave Oven (EUT).
- 6.4.4. The Microwave Oven (EUT) was set in "Power-High" mode.

6.5. Test Procedure

The EUT was placed on a turn table which was 0.8 meter or 1 meter (0.8 meter for measurement below 1GHz and 1 meter for measurement above 1GHz) above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters above reference plane to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna was used as a receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC/OST MP-5 (1986) regulation.

The bandwidth of test receiver using Q.P detector was set at 120kHz for measurement below 1GHz and resolution bandwidth of spectrum analyzer using Average detector was set at 1MHz for measurement above 1GHz.

Load for measurement on second and third harmonics: Two loads one of 700 and the other of 300 ml, of water are used. Each load is tested both with the beaker located in the center of the microwave oven and with it in the right front corner.

Load for all other measurement: 700ml of water, with the beaker located in the center of the microwave oven.

All the test results are listed in section 6.6.

6.6. Measurement Results

PASSED. All the emissions not reported below are too low against the prescribed limits.

6.6.1. Measurement on Frequency range below 1GHz.

Date of Test:		Oct. 17, 2003				18	
EUT:		Microwave Oven Humidity:					
Test Mode:		Load: 700ml, Beaker Location: Center					
Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBµV	Emission L Horizonta dBµV/n	al Limits	Margin dB	
31.940 109.540 214.300 330.700 427.700 539.250 722.580 877.780 988.360	22.19 18.02 22.63 14.80 17.10 18.77 21.40 22.80 23.02	1.10 2.20 3.11 4.20 5.15 7.10 6.50 7.30 7.80	-1.58 5.92 -2.49 13.71 -1.58 -2.02 -1.15 -1.83 -1.50	21.71 26.14 23.25 32.71 20.67 23.85 26.75 28.27 29.32	72.00 72.00 72.00 72.00 72.00 72.00 72.00 72.00 72.00 72.00	50.29 45.86 48.75 39.29 51.33 48.15 45.25 43.73 42.68	
Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBµV	Emission L Vertical dBµV/n	Limits	Margin dB	
48.430 159.980 276.380 334.580 489.780 586.780 708.030 838.980 967.020	16.46 21.20 25.36 14.40 17.64 19.90 21.30 22.50 23.89	1.40 2.70 3.70 4.20 6.30 6.30 6.60 7.10 7.70	14.96 1.63 -0.72 10.46 -1.19 -0.60 -1.10 -1.61 -1.00	32.82 25.53 28.34 29.06 22.75 25.60 26.80 27.99 30.59	72.00 72.00 72.00 72.00 72.00 72.00 72.00 72.00 72.00	39.18 46.47 43.66 42.94 49.25 46.40 45.20 44.01 41.41	

Remarks: 1. All readings are Quasi-Peak values.

^{2.} Emission Level = Meter Reading + Antenna Factor + Cable Loss.

6.6.2. Frequency range above 1GHz.

Date of Test:		O	et. 18, 2003	Ter	nperature:	20
EUT:		Mic	crowave Oven		Humidity:	45%
Test Mode:		L	oad: 700ml, Bea	ker Location: C	Center	
Emission	Antenna	Cable	Meter Reading			
Frequency MHz	Factor dB/m	Loss dB	Horizontal dBµV	Horizontal dBµV/m	Limits dBµV/m	Margin dB
1782.000	26.84	7.07	19.94	53.85	72.00	18.15
2666.000	29.50	6.73	19.43	55.66	72.00	16.34
4043.000	32.89	8.53	14.91	56.33	72.00	15.67
4927.000	33.92	9.13	18.30	61.35	72.00	10.65
6797.000	35.72	10.74	13.07	59.53	72.00	12.47
7392.000	37.15	11.54	16.37	65.06	72.00	6.94
8378.000	38.54	12.21	12.54	63.29	72.00	8.71
9823.000	38.48	12.91	7.29	58.68	72.00	13.32
11523.00	39.07	15.19	2.71	56.97	72.00	15.03
Emission	 Antenna	Cable	Meter Reading	Emission Leve	 el	
Frequency	Factor	Loss	Vertical	Vertical	Limits	Margin
MHz	dB/m	dB	dBμV	$dB\mu V/m$	$dB\mu V/m$	dB
1187.000	25.28	4.56	33.66	63.50	72.00	8.50
1731.000	26.60	7.04	26.06	59.70	72.00	12.30
4043.000	32.89	8.53	12.33	53.75	72.00	18.25
4927.000	33.92	9.13	17.86	60.91	72.00	11.09
7392.000	37.15	11.54	17.48	66.17	72.00	5.83
8395.000	38.57	12.23	7.91	58.71	72.00	13.29
9840.000	38.50	12.91	2.08	53.49	72.00	18.51
11523.00	39.07	15.19	1.71	55.97	72.00	16.03

Remarks: 1. All readings are Average values.

^{2.} Emission Level = Meter Reading + Antenna Factor + Cable Loss.

Horizontal

 $dB\mu V/m$

61.35

65.06

Vertical

 $dB\mu V/m$

60.91

66.17

Temperature:

Limits

 $dB\mu V/m$

72.00

72.00

Limits

 $dB\mu V/m$

72.00

72.00

20

Margin

dB

10.65

Margin

dB

11.09

5.83

6.94

6.6.3. Frequency range above 1GHz. (On second and third harmonics)

Oct. 18, 2003

		,	r	
EUT:		Microwave Oven	Humidity:	45%
Load:		700ml		
Beaker Location	on: Center			
Emission	Antenna	Cable Meter Reading Emission	Level	

Horizontal

dBμV

18.30

16.37

Vertical

 $dB\mu V$

17.86

17.48

Cable Meter Reading Emission Level

Beaker Location:	Right Front Corner

Factor

dB/m

33.92

37.15

Antenna

Factor

dB/m

33.92

37.15

Loss

dB

9.13

11.54

Loss

dB

9.13

11.54

Date of Test:

Frequency

4927.000

7392.000

Emission

Frequency

4927.000

7392.000

MHz

MHz

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBµV	Emission Level Horizontal dBµV/m	$\begin{array}{c} Limits \\ dB\mu V/m \end{array}$	Margin dB
4929.783 7388.085	33.94 37.16	9.11 11.54	17.77 12.36	60.82 61.06	72.00 72.00	11.18 10.94
Emission Frequency	Antenna			Emission Level		
MHz	Factor dB/m	Loss dB	Vertical dBµV	Vertical dBµV/m	Limits dBµV/m	Margin dB

Remarks: 1. All readings are Average values.

^{2.} Emission Level = Meter Reading + Antenna Factor + Cable Loss.

Temperature: 20

EUT:		Mic	crowave Oven		Humidity:	45%
Load:			30)0ml		
Beaker Location Emission Frequency MHz	n: Center Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBµV	Emission Le Horizontal dBµV/m		Margin dB
4913.820 7366.801	33.88 37.11	9.15 11.51	14.20 14.88	57.23 63.50	72.00 72.00	14.77 8.50

Oct. 18, 2003

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBµV	Emission Level Vertical dBµV/m	Limits dBµV/m	Margin dB
4913.820	33.88	9.15	18.00	61.03	72.00	10.97
7361.480	37.10	11.50	11.52	60.12	72.00	11.88

Beaker Location: Right Front Corner

Date of Test:

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBµV	Emission Level Horizontal dBµV/m	$\begin{array}{c} Limits \\ dB\mu V/m \end{array}$	Margin dB
 4924.462 7388.085	33.92 37.16	9.12 11.54	13.64 5.95	56.68 54.65	72.00 72.00	15.32 17.35
Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBµV	$\begin{array}{c} Emission \ Level \\ Vertical \\ dB\mu V/m \end{array}$	$\begin{array}{c} Limits \\ dB\mu V/m \end{array}$	Margin dB

Remarks: 1. All readings are Average values.

^{2.} Emission Level = Meter Reading + Antenna Factor + Cable Loss.

7. DEVIATION TO TEST SPECIFICATIONS

[NONE]