

FCC CFR47 PART 18 SUBPART C

ISM EQUIPMENT

TEST REPORT

FOR

MICROWAVE OVEN

Model: P90F23(X)-(Y) (Testing case: P90F23AP-X3)

Magnetron Model: Galanz, M24FB-610A

Brand Name: Galanz

Test Report No.: 11CA05201-02

FCC ID: UHW9023007

Prepared for

GUANGDONG GALANZ ENTERPRISE (GROUP)CO.,LTD.

25 RONGGUI NAN ROAD, RONGGUI SHUNDE, GUANGDONG

P.R.C.528305

ACCORDING TO

FCC PART 18 INDUSTRIAL, SCIENTIFIC AND MEDICAL EQUIPMENT

&

FCC/0ST MP-5(1986) FCC METHODS OF MEASUREMENTS OF RADIO

NOISE EMISSION FROM INDUSTRIAL, SCIENTIFIC AND MEDICAL

EQUIPMENT

Prepared By: Bossco He

Reviewed By: Yanhan Lu

QC Manager: Valley.Wang

Test Report Released By _____

Name



05/13/2011 _____

Date

List Attached Files

Exhibit Type	File Description	File Name
Test report	Test report	UHW9023007 -Test report .pdf
Operation Description	Operational Description	UHW9023007 -Operational description .pdf
External Photos	External Photos	UHW9023007 -External photos .pdf
Internal Photos	Internal Photos	UHW9023007 -Internal photos .pdf
Block Diagram	Block Diagram	UHW9023007 -Block diagram .pdf
Schematics Diagram	Schematics Diagram	UHW9023007 -Schematics .pdf
ID Label/ Location	ID Label/ Location	UHW9023007 -label & location .pdf
User Manual	User Manual	UHW9023007 -User manual .pdf
Test setup Photos	Test setup Photos	UHW9023007 -Test setup photos .pdf
Part List	Part List	UHW9023007 - Part list .pdf

Test Location

Tests performed at Galanz in a certified Ansi Semi-Anechoic Chamber and Shielded Room.

Test Site Location

EMC Laboratory

Guangdong Galanz Enterprises Co., Ltd

25 South Ronggui Rd., Shunde, Foshan, Guangdong, China.

Tel: 86-757-23612785

Fax: 86-757-23612537

In compliance with the site registration requirements of section 2.948 of the FCC rules to perform EMI measurements for the general public.

FCC Registration Number: 580210

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Opinions and Interpretations

This test report relates to the above mentioned equipment under test (EUT). Without permission of EMC Laboratory of Guangdong Galanz Enterprises Co., Ltd, this report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products. The manufacturer has sole responsibility of continued compliance of the device.

Statement of Measurement Uncertainty

The data and results referenced in the document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.

Administrative Data

Test Sample **Microwave oven**
Model Numbers **P90F23(X)-(Y)**
Model Tested **P90F23AP-X3**
Brand Name **Galanz**
Date Tested **May 10, 2011—May 11, 2011**
Applicant **Guangdong Galanz Enterprises Co., Ltd.**
 25 ronggui nan Rd., Shunde, Foshan, Guangdong , China
Telephone **86-757-23612785**
Fax **86-757-23612537**
Manufacturer **Guangdong Galanz Enterprises Co., Ltd.**
 25 ronggui nan Rd., Shunde, Foshan, Guangdong , China

EUT DESCRIPTION

Guangdong Galanz Enterprises Co., Ltd. Model tested P90F23AP-X3
(Refer to the EUT in this report) is a Microwave Oven.

Specifications:

Power consumption	120Vac 60Hz, 1350W(Microwave)
Output	900W
Operation frequency	2450Hz
Magnetron brand	Galanz
Magnetron number	M24FB-610A
Outside dimensions(HxWxD)	11 5/16×19 5/16×14 in.
Cavity dimensions(HxWxD)	7 3/4×13 3/8×13 5/16 in.
Capacity	0.8cu.ft
Cooking uniformity	Turntable System
Net weight	Approx. 30.0lb.

Type of Deriver

P90F23(X)-(Y)model designations:

P: With Microwave functions only.

90: denote the output power is 900W

F23: denote different capacity in 23 liters.

Variable (X) may be L,P,SL,SP ,AL,AP,ASL,ASP ,EL,EP, ESL,ESP , ALH,APH

“L” is pull-out type door, “P” is push-button type door. When there is no letter before “L” and “P”, denotes mechanical control model; When there are “A” or “E” denote the electrical control model. “S” denotes stainless steel cavity; When there is without “S” before “L” or “P”, denotes the epoxy painted cavity, “H” means with the humidity sensor

Variable (Y) may compose by one to five characters from A to Z and/or numbers from 0 to 9. It represents the differences of the appearance.

Test Summary

The Electromagnetic Compatibility Requirements on model tested P90F23AP-X3 for this test is stated below. All results listed in this report relate exclusively to this above mentioned model as the Equipment under Test. This report confers no approval or endorsement upon any other component, host or sub-system used in the test set-up

Emission Tests				
Specifications	Description	Test results	Test point	Remark
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	Radiation Hazard Measurement	Passed	Enclosure	Attachment 1
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	Input Power Measurement	Passed	AC Input Port	Attachment 2
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	RF Output Power Measurement	Passed	EUT	Attachment 3
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	Operating Frequency Measurement	Passed	EUT	Attachment 4
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	Conducted Emission	Passed	AC Input Port	Attachment 5
FCC Part 18:2004 FCC/OST MP-5:1986 ANSI C63.4:2003	Radiated Emission	Passed	Enclosure	Attachment 6

Load for Microwave Ovens

For all measurements the energy developed by the oven was absorbed by a dummy load consisting of a quantity of tap water in a beaker. If the oven was provided with a shelf or other utensil support, this support was in its initial normal position. For ovens rated at 1000 watts or less power output, the beaker contained quantities of water as listed in the following subparagraphs, for ovens rated at more than 1000 watts output, each quantity was increased by 50% for each 500 watts or fraction thereof in excess of 1000 watts, additional beakers were used if necessary

- Load for power output measurement: 1000 milliliters of water in the beaker located in the center of the oven.
- Load for frequency measurement: 1000 milliliters of water in the beaker located in the center of the oven.
- load for measurement of radiation on second and third harmonic : Two loads, one of 700 and the other of 300 milliliters, of water are used , Each load is tested both with the beaker located in the center of the oven and with it in the right front corner.
- Load for all other measurements: 700 milliliters of water, with the beaker located in the center of the ovens

Equipment Modification

Any modifications installed previous to testing by Guangdong Galanz Enterprises Co., Ltd will be incorporated in each production model sold or leased in United States

EUT Sample Photos for model _____



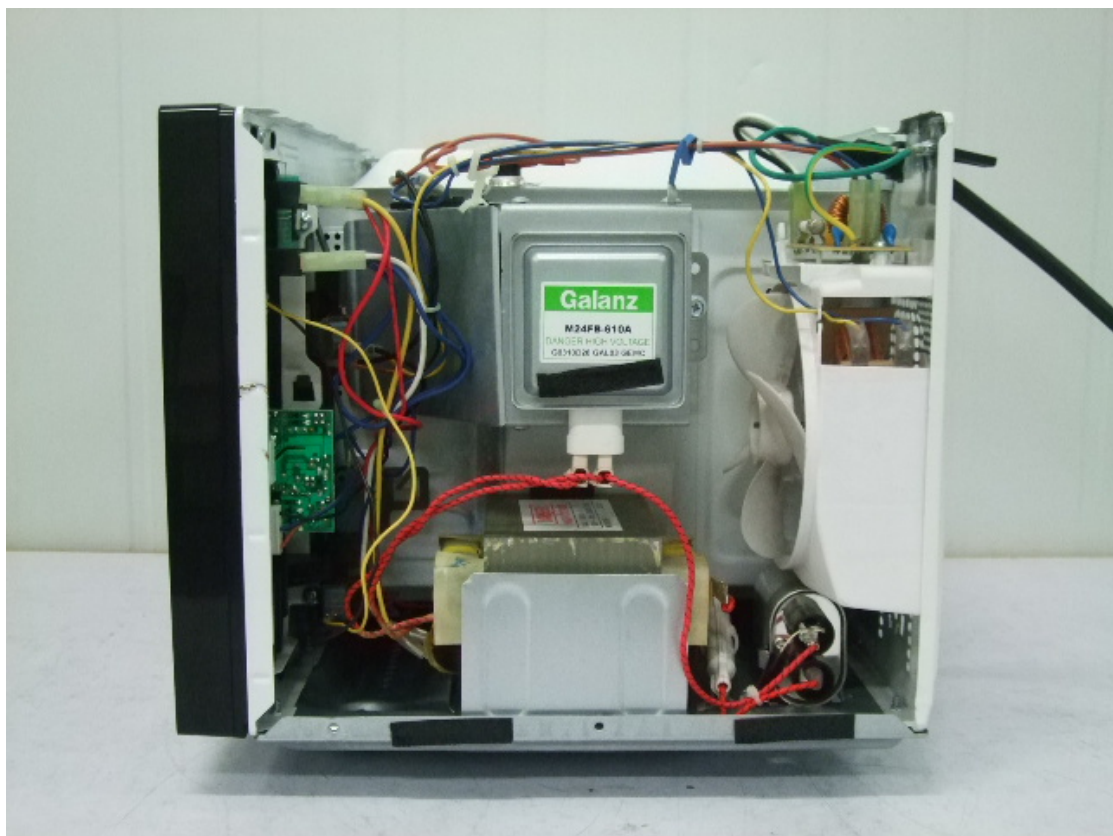
Front and top view



Door open view



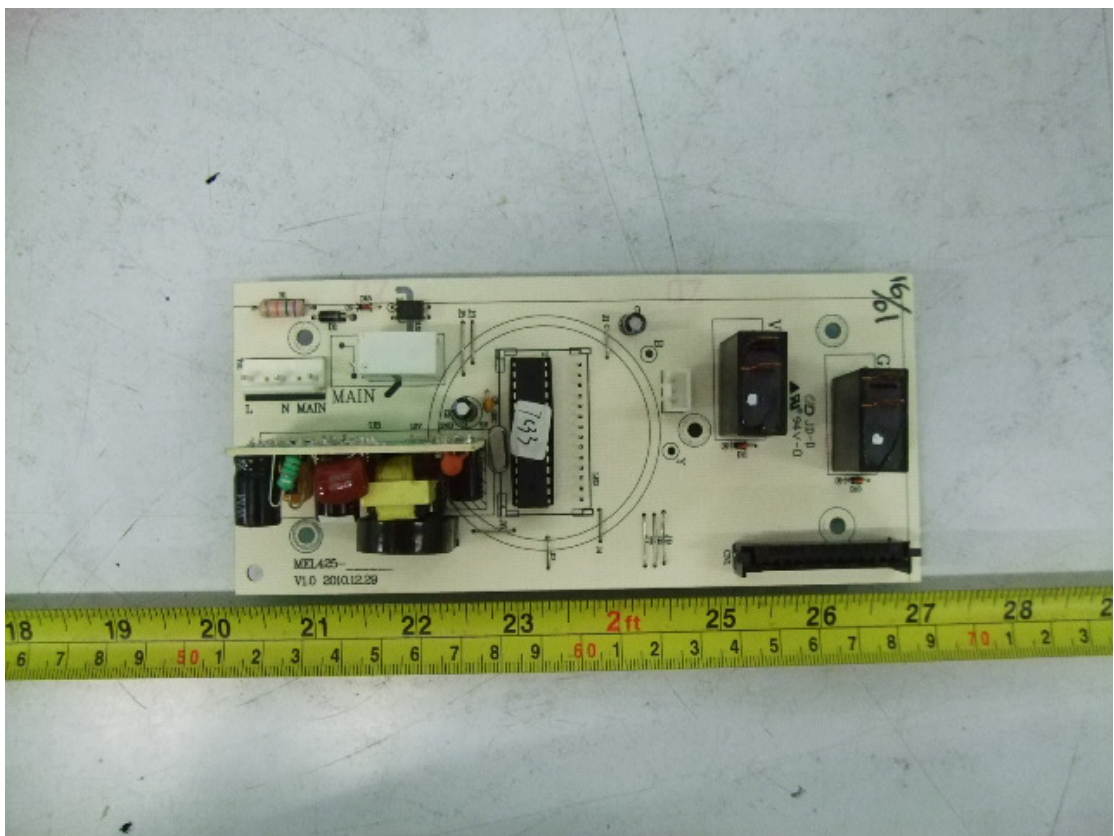
Rear View of EUT



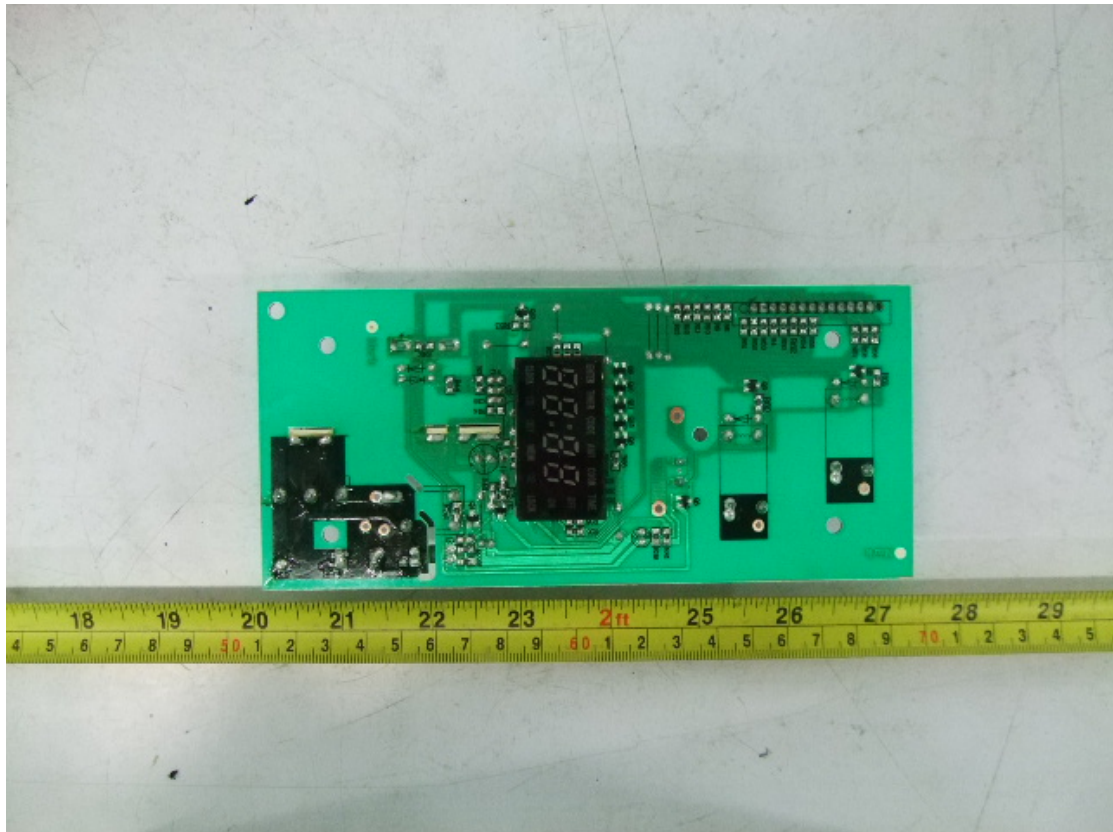
Uncovered View from right side



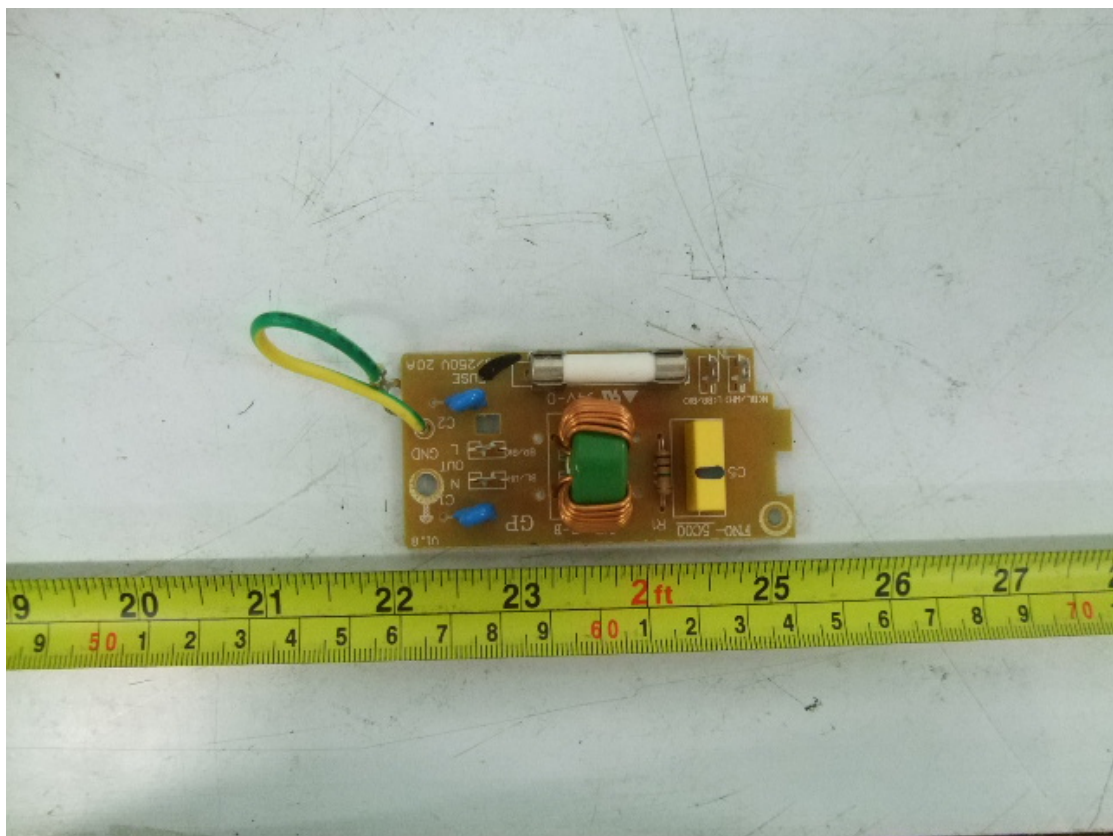
Uncovered View from top side



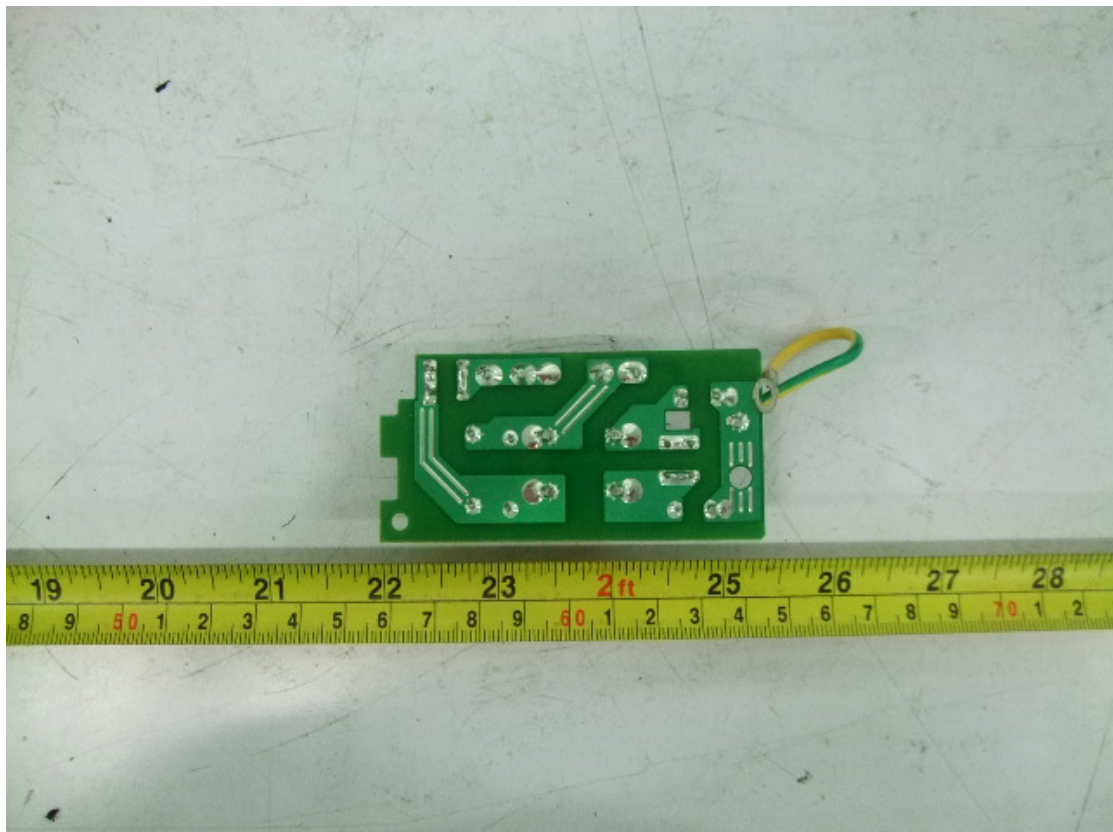
Front view of Main board



Back view of Main board



Front View of AC power filter board



Back of View AC power filter board

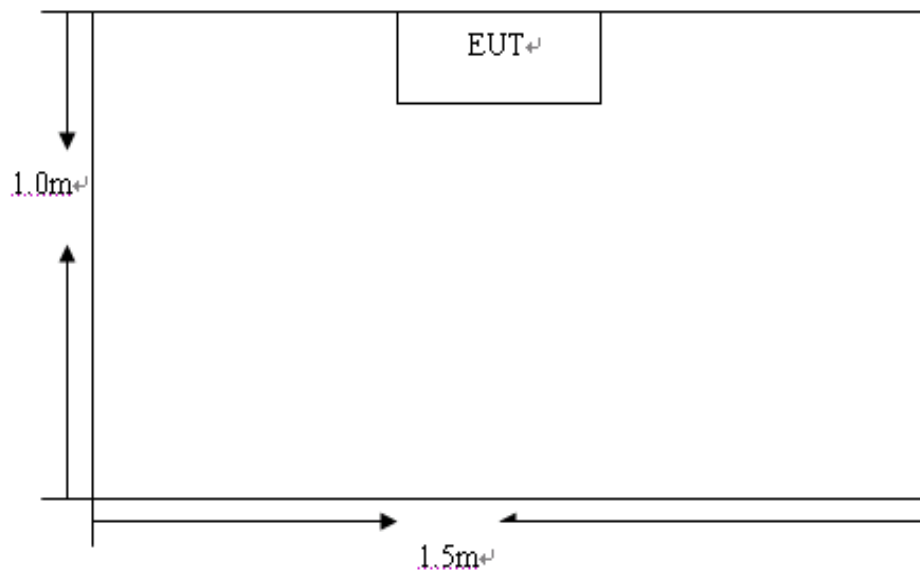


View of Magnetron

Test System Details

EUT					
Model Numbers	P90F23(X)-(Y)				
Model tested	P90F23AP-X3				
Description	Microwave Oven				
Manufacturer	Guangdong Galanz Enterprises Co., Ltd				
Support Equipment					
N/A					
Cable Description					
Description	From	To	Length Meters	Shielded Y/N	Ferrite Y/N
Power cord	EUT	Plug	1.05	N	N

Configuration of Tested System



ATTACHMENT 1-RADIATION HAZARD TEST

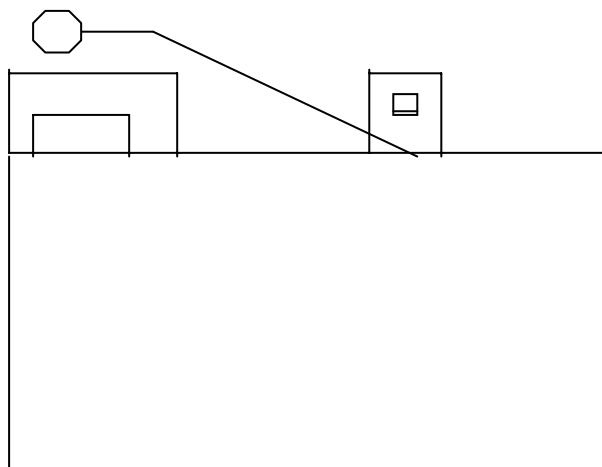
Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven
Model Tested: P90F23AP-X3		EUT Designation: Home or Office
Temperature: 23°C		Humidity: 52%RH
ATM Pressure: 101kPa		Grounding: Through AC power cord
Tested By: Bossco He		Date of Test: May 10,2011
Test Reference	ANSI C63.4: 2003, FCC/OST MP-5:1986	
Test Procedure	<p>The EUT was set up according to the FCC MP-5 and FCC Part 18 for Radiation Hazard Measurement. The measurement was using a microwave leakage meter to measure the Radiation leakage in the as-received condition with the oven door closed. A 1000ml water load in a beaker was located in the center of the oven and the Microwave oven was set to maximum power. While the oven operating, the microwave meter will check the leakage and then record the maximum leakage</p>	
Tested Range	N/A	
Test Voltage	120VAC/60Hz	
Results	<p>There was no microwave leakage exceeding a power level of 0.02mW/cm² observed at any point 5cm or more from the external surface of the oven.</p> <p>A maximum of 1.0 mW/cm² is allowed in accordance with the applicable FCC standards. Hence, microwave leakage in the as-received condition with the oven door closed was below the maximum allowed.</p> <p>The test results relate only to the equipment under test provided by client.</p>	
Changes or Modifications	There were no modifications installed by Galanz test personnel	
M. Uncertainty	0.01 mW/cm ²	

Test Equipment List

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Field Monitor	ETS	AR FM5004	A0304252	2011-01-21	2013-01-20
Electric Field probe	ETS	AR FP6001	A0304302	2011-01-21	2013-01-20
Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.					

Radiation Hazard Test Set-up

Microwave Leakage Tester





Radiation Hazard Test Setup

ATTACHMENT 2-INPUT POWER MEASUREMENT

Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18	
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven	
Model Tested: P90F23AP-X3		EUT Designation: Home or Office	
Temperature: 24℃		Humidity:52%RH	
ATM Pressure: 101kPa		Grounding: Through AC power cord	
Tested By: Bossco He		Date of Test: May 10,2011	
Test Reference	ANSI C63.4: 2003 , FCC/OST MP-5:1986		
Test Procedure	The EUT was set up according to the FCC MP-5 and 18 for input power measurement, The input power and current was measured using a power analyzer. A 1000ml water load in a beaker was located in the center of the oven and the Microwave oven was set to maximum power, while the oven is operating, use a voltmeter and an ampere-meter to test the AC input voltage and current.		
Tested Range	N/A		
Test Voltage	120VAC/60Hz		
Results	Based on the measured input power , the EUT was found to be operating within the intended specifications The test results relate only to the equipment under test provided by client		
Changes or Modifications	There were no modifications installed by Galanz test personnel		
M. Uncertainty	±5W		

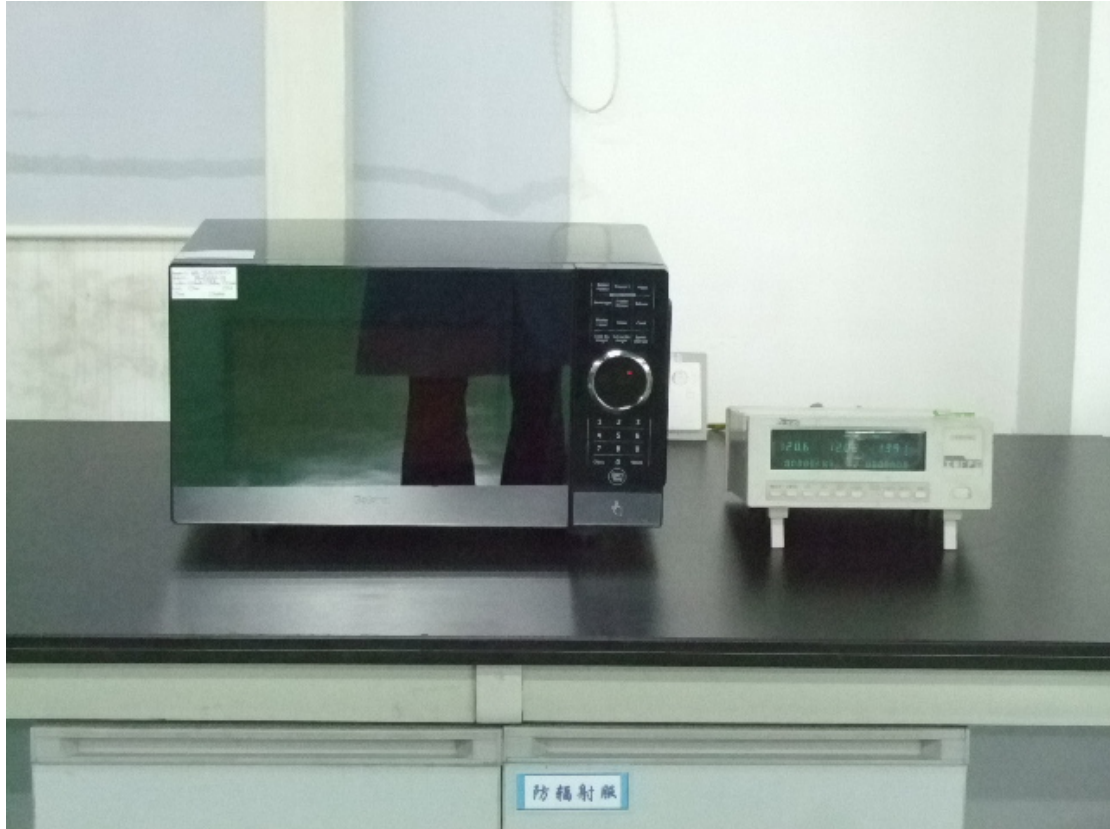
Test Data

Input Voltage Vac/Hz	Input Current amps	Measured Input power(watt)	Rated input power(watt)
120V/60Hz	111.53	1391	1350

Test Equipment List

Test equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Power frequency test system	Ainuo	AN8716PX	058704273	2010-07-06	2011-07-06

Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.



Input Power Test Setup

ATTACHMENT 3-RF OUTPUT POWER MEASUREMENT

Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven
Model Tested: P90F23AP-X3		EUT Designation: Home or Office
Temperature: 24°C		Humidity: 52%RH
ATM Pressure: 101kPa		Grounding: Through AC power cord
Tested By: Bossco He		Date of Test: May 10,2011
Test Reference	ANSI C63.4: 2003 , FCC/OST MP-5:1986	
Test Procedure	<p>The EUT was set up according to the FCC MP-5 and 18 for RF power measurement, The Caloric method was used to determine maximum RF output power.</p> <ol style="list-style-type: none"> 1) A 1000ml water load in a beaker is located in the center of the oven. 2) Measure and record the initial temperature of the 1000ml water load. 3) Start and keep the oven operating at maximum output power for 120 seconds. 4) At the end of the 120 seconds, measure and record the final temperature of the 1000ml water load. 5) Calculate the RF output power $\text{RF Output Power (W)} = 4.2 \times 1000 \times (\text{Final Temp} - \text{Initial Temp}) / 120$	
Tested Range	N/A	
Test Voltage	120VAC/60Hz	
Results	<p>RF output power =791W</p> <p>The test results relate only to the equipment under test provided by client</p>	
Changes or Modifications	There were no modifications installed by Galanz test personnel.	
M. Uncertainty	±0.3°C	

Test Data

Quality of water(ml)	Starting temperature(°C)	Final temperature(°C)	Elapsed time (seconds)	RF output power(watt)
1000	18.0	40.6	120	791

Test Equipment List

Test equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Data Acquisition	TES	TES-1310	021108782	2011-04-04	2012-04-04

Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.



RF Output Power Test Set-up

ATTACHMENT 4-OPERATING FREQUENCY MEASUREMENT

Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18	
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven	
Model Tested: P90F23AP-X3		EUT Designation: Home or Office	
Temperature: 25°C		Humidity: 53%RH	
ATM Pressure: 100.2kPa		Grounding: Through AC power cord	
Tested By: Bossco He		Date of Test: May 11,2011	
Test Reference	ANSI C63.4: 2003 , FCC/OST MP-5:1986		
Test Procedure	<p>The EUT was set up according to the FCC MP-5 and 18 for Operating Frequency measurement</p> <p>1) The Variation of frequency with time</p> <p>The operating frequency was measured using a spectrum analyzer, starting with EUT at room temperature, a 1000ml water load in a breaker was located in the center of the oven, set a spectrum analyzer with antenna at 3 meters distance from the oven and oven was operated at maximum output power, The fundamental operating frequency was monitored until the water load was reduced to 20 percent of the original load.</p> <p>2) The variation of frequency with Line Voltage.</p> <p>The operating frequency was measured using a spectrum analyzer. The EUT was operated/ warmed by at least 10 minutes of use with a 1000ml water load at room temperature at the beginning of the test. Then the operating frequency was monitored as the input voltage was varied between 80 and 125 percent of the nominal rating</p>		
Tested Range	2450±50MHz		
Test Voltage	120VAC/60Hz		
Results	Refer to following pages for details of the variation in operating frequency with time & line voltage measurement		
Changes or Modifications	There were no modifications installed by Galanz test personnel.		
M. Uncertainty	Freq.±10kHz		

Test data

Variation in Operating Frequency with Time

Minimum Frequency(MHz)	Maximum Frequency(MHz)
2406.4	2496.4

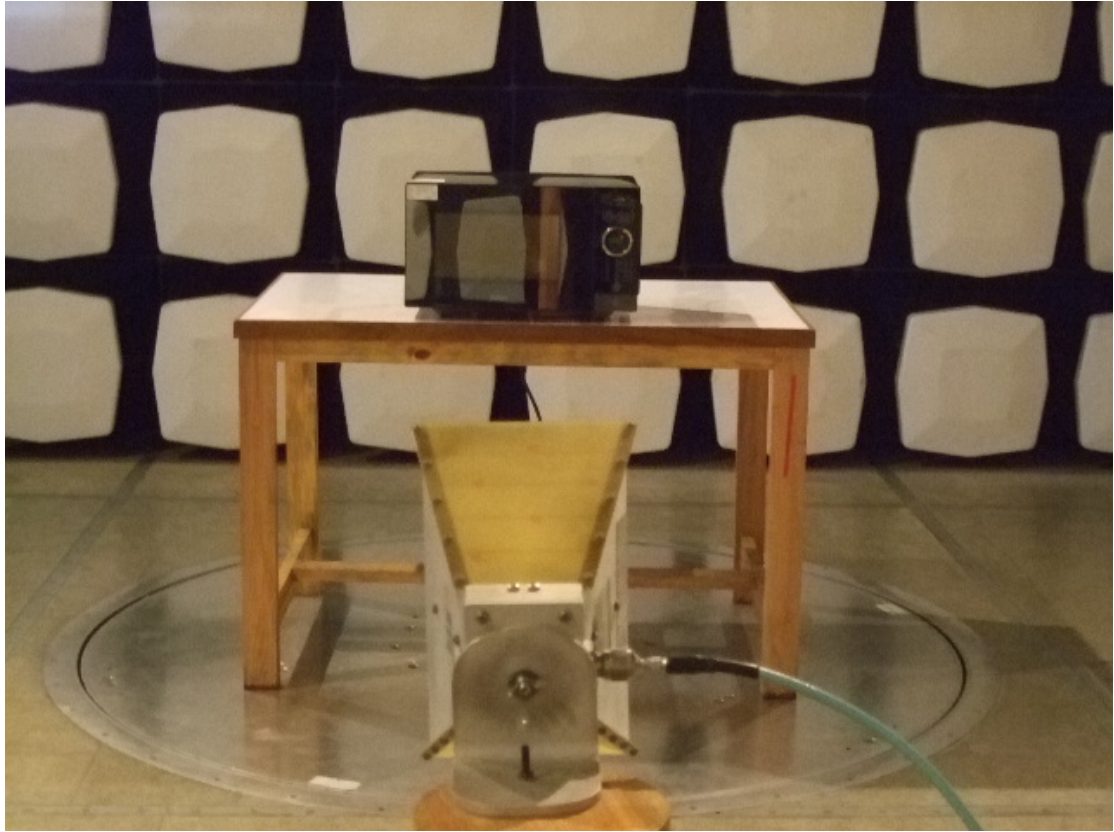
Variation in Operating Frequency with Line Voltage

Minimum Frequency(MHz)	Maximum Frequency(MHz)
2408.8	2496.4
Note: Line voltage varied from 96Vac to 150Vac	

Test Equipment List

Test equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Horn Antenna	ETS	3115	6587	2010-08-02	2012-08-02
Spectrum Analyzer	R&S	FSP30	100755	2010-11-09	2011-11-09
3m Anechoic chamber	ETS	N/A	N/A	2009-05-23	2011-05-23

Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.



Operating Frequency Test Set-up

ATTACHMENT 5-CONDUCTED EMISSION TEST RESULTS

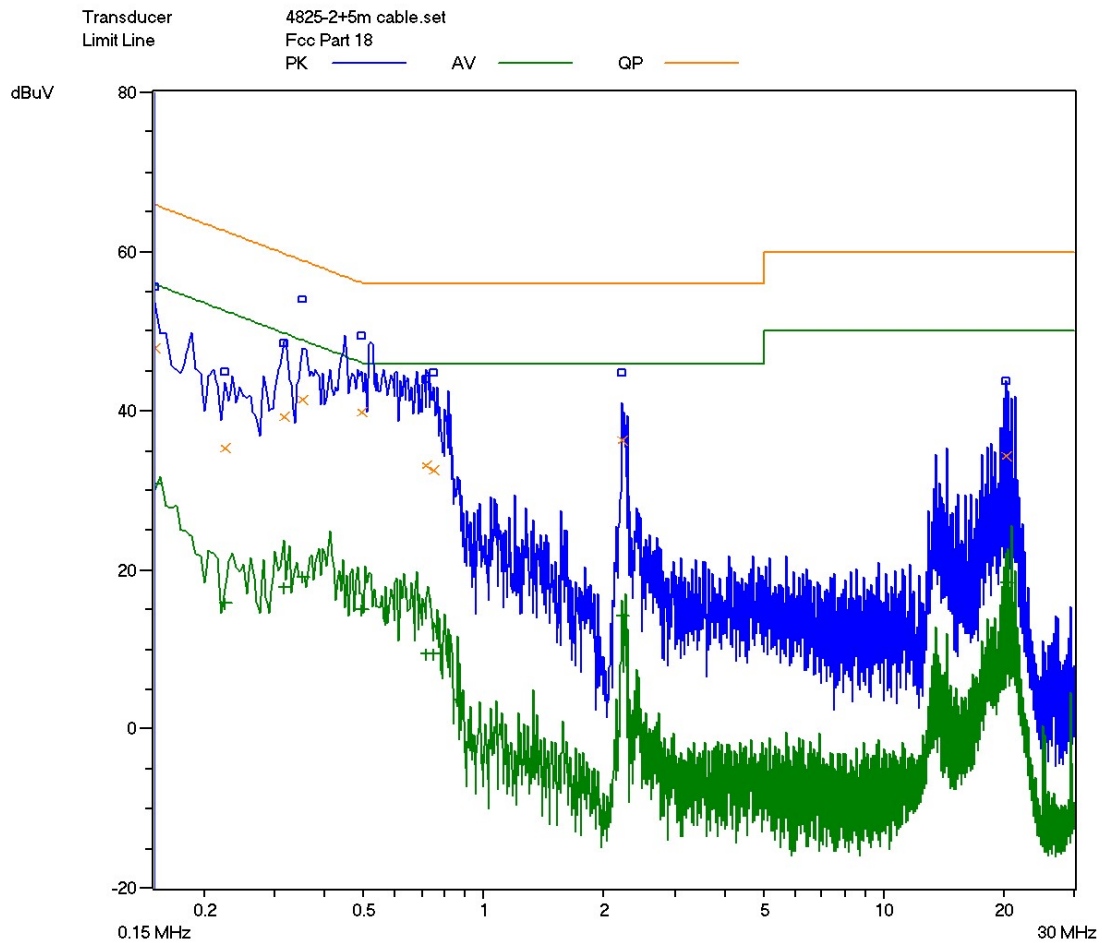
Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven
Model Tested: P90F23AP-X3		EUT Designation: Home or Office
Temperature: 25°C		Humidity: 52%RH
ATM Pressure: 100.9kPa		Grounding: Through AC power cord
Tested By: Bossco He		Date of Test: May 11, 2011
Test Reference	ANSI C63.4: 2003 , FCC/OST MP-5:1986	
Test Procedure	The EUT was set up according to the guideline of ANSI C63.4:2003 & FCC MP-5 for conducted emission, The measurement was using a AMN on each line and an EMI receiver peak scan was made at the frequency measurement range , the six highest significant peak were then marked , and these signals were then quasi peaked and averaged. The frequency range investigated was from 150kHz to 30MHz	
Tested Range	150kHz to 30MHz	
Test Voltage	120VAC/60Hz	
Results	The EUT meets the requirements of test reference for conducted Emission on line L by 12.4dBμV of Quasi-peak detector and by 22.4 dBμV of Average detector.	
Changes or Modifications	There were no modifications installed by Galanz test personnel.	
M. Uncertainty	±2.5dB	

CE-L.res
CE L

5/11/11 3:12:39 PM

Title CE L
Type Microwave Oven
EUT / Ser.No. P90F23AP-X3
Manufacturer Galanz
Condition Full Power Of Microwave Mode

Frequency Range(s)	Range 1
Start Frequency	150 kHz
Stop Frequency	30 MHz
Step Frequency	5 kHz
Attenuator	Auto
Detector (Pre)	AV CISPR
IF Bandwidth (Pre)	9 kHz
Measure Time (Pre)	10 ms
Detector (Final)	QP
IF Bandwidth (Final)	9 kHz
Measure Time (Final)	1 s
Sub Ranges (Final)	20



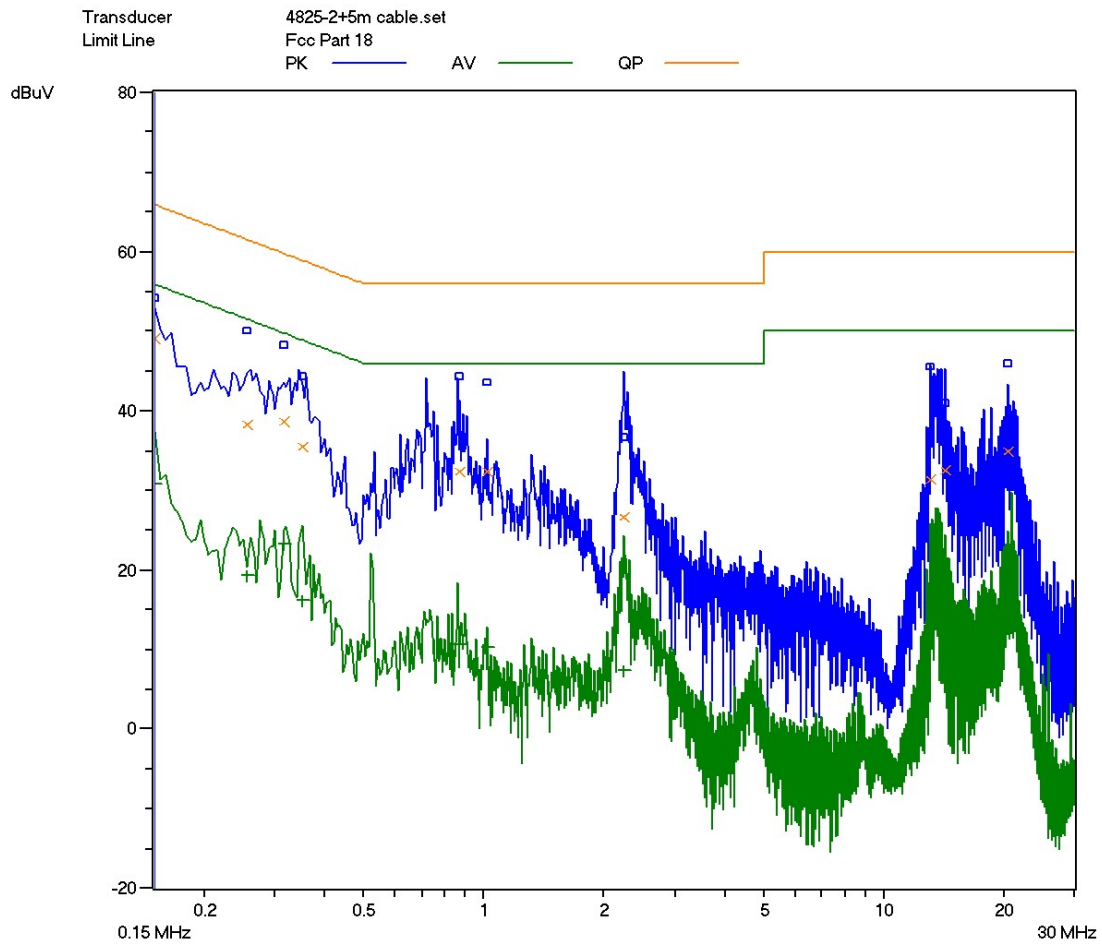
Line L Conducted Emission Graph

CE-N.res
CE N

5/11/11 3:06:57 PM

Title CE N
Type Microwave Oven
EUT / Ser.No. P90F23AP-X3
Manufacturer Galanz
Condition Full Power Of Microwave Mode

Frequency Range(s)	Range 1
Start Frequency	150 kHz
Stop Frequency	30 MHz
Step Frequency	5 kHz
Attenuator	Auto
Detector (Pre)	AV CISPR
IF Bandwidth (Pre)	9 kHz
Measure Time (Pre)	10 ms
Detector (Final)	QP
IF Bandwidth (Final)	9 kHz
Measure Time (Final)	1 s
Sub Ranges (Final)	20



Line N Conducted Emission Graph

Test Data

Line	Frequency (MHz)	Corrected Reading(QP)	Corrected Reading(AV)	QP limit dB uV	AV limit dB uV
L	0.1508	49.8	33.5	65.9	55.9
L	0.3508	42.9	20.2	58.9	48.9
L	0.4484	44.5	19.4	56.9	46.9
N	0.1516	48.4	29.1	65.8	55.8
N	0.8654	34.5	10.4	56.0	46.0
N	13.6688	35.9	15.8	60.0	50.0

Test Equipment List

Test equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Receiver	SCHAFFNER	SMR4503	44	2010-07-08	2011-07-08
LISN	ETS	4825/2	1161	2010-07-08	2011-07-08
Shielding Room	ETS	N/A	N/A	2011-05-18	2012-05-18
Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.					



Conducted Emission Test Set-up

ATTACHMENT 6-RADIATED EMISSION TEST RESULTS

Client: Guangdong Galanz Enterprises Co Ltd		Test Standard: FCC Part 18	
Model Numbers: P90F23(X)-(Y)		Product: Microwave Oven	
Model Tested: P90F23AP-X3		EUT Designation: Home or Office	
Temperature: 25°C		Humidity: 52%RH	
ATM Pressure: 100.1kPa		Grounding: Through AC power cord	
Tested By: Bossco He		Date of Test: May 11,2011	
Test Reference	ANSI C63.4: 2003 , FCC/OST MP-5:1986		
Test Procedure	<p>The EUT was set up according to the guidelines of ANSI C63.4: 2003 & FCC MP- 5 for radiated emissions. Microwave oven was placed on a 1m*1.5m nonconductive table. The top of the table is 0.8 m above the ground. The table is placed on a flush mounted metal turntable.</p> <p>An EMI receiver peak scan was made at the frequency measurement range (pre- scan) in an Anechoic chamber. Signal discrimination was then performed and the significant peaks marked. All data was recorded in Quasi-peak detection mode from 30 MHz to 1GHz and average detector mode above 1GHz.</p> <p>The following data lists the significant emission frequencies, measured levels, correction factors (including cable and antenna correction factors), and the corrected readings against the limits. Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
Tested Range	30MHz to 24.5GHz		
Test Voltage	120VAC/60Hz		
Results	The EUT meets the requirements of test reference for Radiated emission on Horizontal polarization by 11.03dBuV/m of average detector at 4.95284GHz		
Changes or Modifications	There were no modifications installed by Galanz test personnel.		
M. Uncertainty	±3.2dB		

Test Data

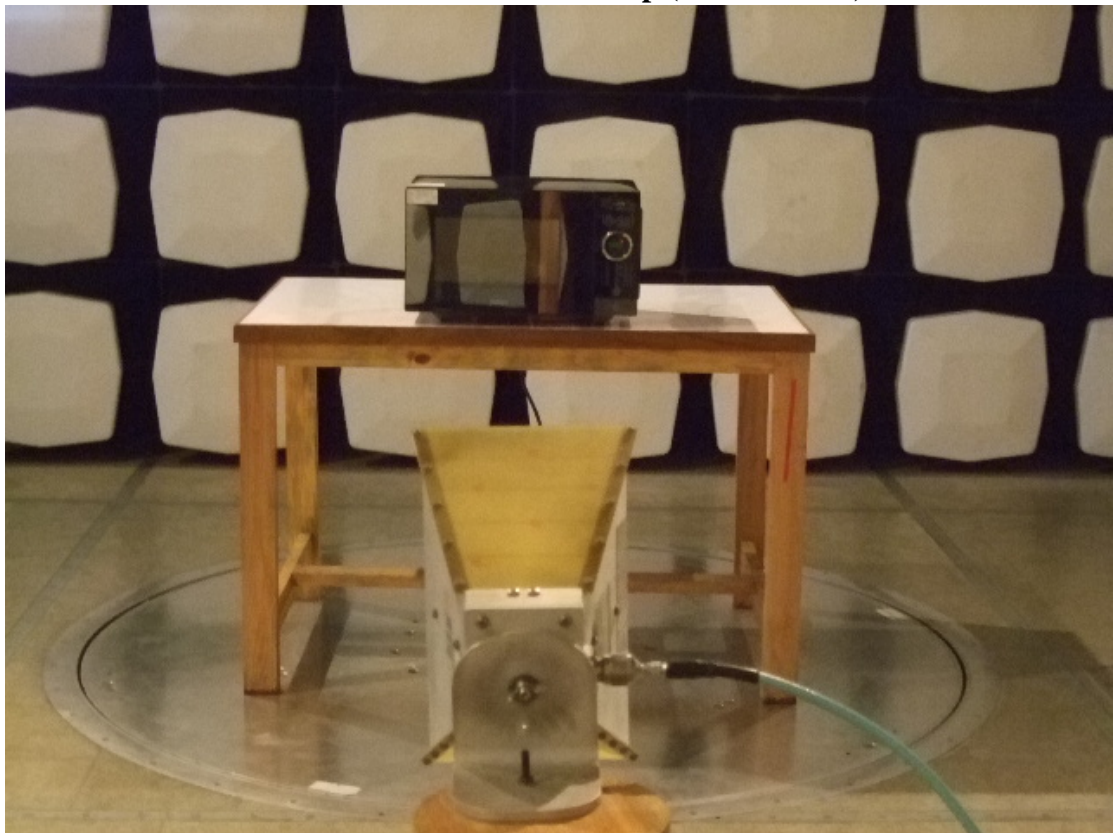
30MHz-1GHz				
Frequency (MHz)	Antenna Polarization (V/H)	3 Meters Corrected QP reading (dBμV/m)	Delta QP (dB)	3 Meters Limits (dBμV/m)
103.2060	V	39.2	30.97	69.95
125.0640	V	35.6	34.35	69.95
236.0580	V	45.3	24.65	69.95
154.690	H	23.6	46.35	69.95
176.9020	H	35.8	34.15	69.95
239.2840	H	51.4	18.55	69.95
Note: All readings are quasi-peak unless stated otherwise, using a bandwidth of 120kHz.				
1GHz-25GHz				
Frequency (GHz)	Antenna Polarization (V/H)	3 Meters Corrected AV reading (dBμV/m)	Delta AV (dB)	3 Meters Limits (dBμV/m)
2.14418	V	34.34	35.65	69.95
4.94686	V	57.07	12.88	69.95
8.66092	V	56.34	13.65	69.95
2.19474	H	32.17	37.78	69.95
4.95284	H	58.92	11.03	69.95
8.66494	H	56.15	13.80	69.95
Comment: None				
Note: All reading are average unless stated otherwise, using PK detector RBW=1MHz,VBW=10Hz				

Test Equipment List

Test equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Broadband Antenna	ETS	3142C	00042672	2010-09-26	2012-09-26
Horn Antenna	ETS	3115	6587	2010-08-02	2012-08-02
Band-pass Filter	Micro-Tronic	BRM50702	S/N-030	2010-11-09	2011-11-09
EMI Receiver	SCHAFFNER	SMR4503	44	2010-07-08	2011-07-08
Spectrum Analyzer	R&S	FSP30	100755	2010-11-09	2011-11-09
3m Anechoic chamber	ETS	N/A	N/A	2009-05-23	2011-05-23
Note: All testing were performed using internationally recognized standard. All test instruments were calibrated and traceable to the National Institute of Standards and Technology.					



Radiated Emission Test Setup (30-1000MHz)



Radiated Emission Test Setup (1-25GHz)

The End