

EMI Test Report

On Model Name: Microwave oven

Model Numbers: P9023X-Z

Brand Name: Galanz

FCC ID: UHW9023003

Prepared for Guangdong Galanz Enterprises Co. Ltd

According to

FCC Part 18 Industrial, Scientific and Medical Equipment FCC/OST MP-5(1986) FCC methods of measurements of radio noise emission from industrial, scientific and medical equipment

Test Report#:	PSZ-0801-0609-FCCID
Prepared by:	Eddy Chen
Reviewed by:	Ivan Wen
QC Manager:	Paul Chen

Test Report Released by: _____ Paul J. du 2008, Jan 10 Paul Chen Date

List Attached Files

Exhibit Type	File Description	File Name
Test Report	Test Report	UHW9023003 _Test report.pdf
Operation Description	Technical Description	UHW9023003 _operation description.pdf
External Photos	External Photos	UHW9023003 _External Photos
Internal Photos	Internal Photos	UHW9023003 _Internal Photos
Block Diagram	Block Diagram	UHW9023003 _Block Diagram.pdf
Schematics	Circuit Diagram	UHW9023003 _Schematics.pdf
ID Label/Location	Label and Location	UHW9023003 _Label & Location.pdf
User Manual	User Manual	UHW9023003 _User Manual.pdf
Test setup photos	Test setup photos	UHW9023003 _Test Setup Photos

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room.

Test Site Location:		Guangdong Galanz Enterprise Co. Ltd
		25 South Ronggui Rd., Shunde, Foshan, Guangdong, China
Tel	:	86-755-23612785
Fax	:	86-755-23612537

FCC Registration Number: 580210

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Opinions and Interpretations

This test report relates to the abovementioned equipment under test (EUT). Without the permission of ECMG Worldwide Certification Solution Inc., Test Lab this test 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.

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Administrative Data

Test Sample	: Microwave oven
Model Numbers	: P9023X-Z
Model Tested	: P9023AP-BM1
Brand Name	: Galanz
Date Tested	: 2008, Jan 10
Applicant	: Guangdong Galanz Enterprises Co. Ltd
	25Ronggui Nan Road, Shunde, Foshan, Guangdong, China.
Telephone	: 86-0757-23612785
Fax	: 86-0757-23612537
Manufacturer	: Guangdong Galanz Enterprises Co. Ltd
	25Ronggui Nan Road, Shunde, Foshan, Guangdong, China.

EUT Description

Guangdong Galanz Enterprises Co. Ltd model tested EM923HYY (referred to the EUT in this report) is a Microwave Oven.

Power Supply	120V AC , 60 Hz
Rated Input Power	1350W
Rated Output Power	900W
Operation Frequency	2450MHz
Magnetron Manufacturer	Galanz
Magnetron Model Number	M24FB-210A
Outside Dimensions (HxW×D)	13 _{3/4} (W) X 13(D) X 8 _{7/16} (H) in.
Oven Capacity:	0.9 cu.ft
Net Weight	Approx. 34.4lbs.

Type of Deriver

P9023X-Z model designations:

X=*L*,*AL*,*EL*,*SL*,*TL*,*YL*,*P*,*AP*,*EP*,*SP*,*TP*,*ASL*,*ESL*,*TSL*,*YSL*,*ASP*,*ATP*,*ESP*,*ETP*;

Z may be any combination of one to three letters and/or numbers representing cosmetic differences.

P=denotes only the Microwave functions.

90: denotes the output power is 900W;

23: indicate cavity capacity is 23 liters;

L is pull-out type door, *P* is push-down type door. When there is no letter before "L" and "P", denotes mechanical control model, when there is "A", "Y" or "E" denote the electrical control model.

Test Summary

The Electromagnetic Compatibility requirements on model tested P9023AP-BM1 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 subsystem 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 tag 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 1000watts or less power output, the beaker contained quantities of water as listed in the following subparagraphs. For ovens rated at more than 1000watts output, each quantity was increased by 50% for each 500watts 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 oven.

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.

There were no modifications installed by ECMG Worldwide Certification Solution Inc., test personnel.

EUT Sample Photos for model



Front & Top View



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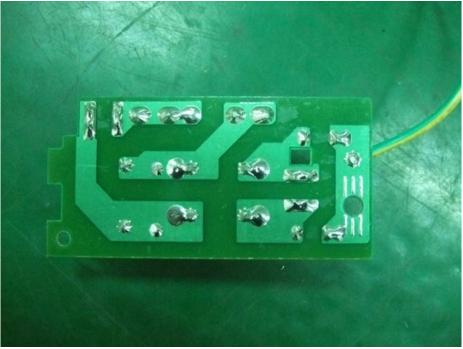
Door opened View



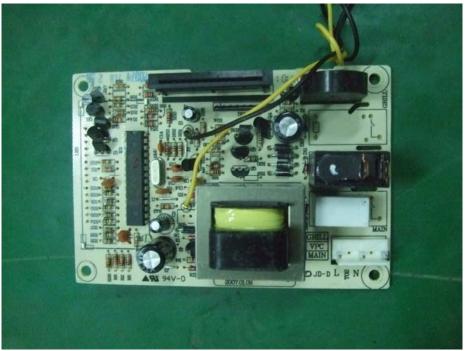
Uncovered View



AC power filter board #1



AC power filter board #2



Main board #1

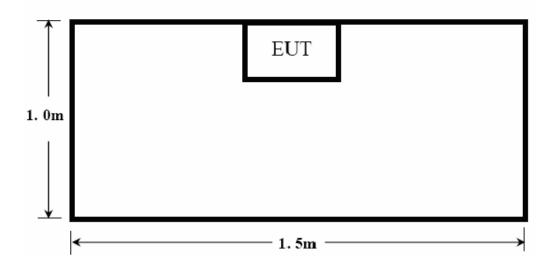


Main board #2

Test System Details

EUT						
Model Numbers:	P9023X-2	Z				
Model Tested:	P9023AP	P-BM1				
Description:	Microway	ie oven				
Manufacturer:	Guangdo	ng Galanz	Enterprises Co. L	td		
Support Equipment						
	N/A					
	Cable Description					
Description	Description From To Length (Meters) Shielded (Y/N) Ferrite (Y/N)					
Power Cable	EUT	Plug	1.20	Ν	N	

Configuration of Tested System



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ATTACHMENT 1 - RADIATION HAZARD TEST

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18	
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)	
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office	
TEMPERATURE:	22°C	HUMIDITY:	60%RH	
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord	
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10	
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 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.			
TESTED RANGE:	N/A			
TEST VOLTAGE:	120VAC / 60Hz			
RESULTS:	There was no microwave leakage exceeding a power level of 0.03 mW/cm2 observed at any point 5cm or more from the external surface of the oven. A maximum of 1.0mW/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. The test results relate only to the equipment under test provided by client.			
Changes or Modifications:	There were no modifications installed by ECMG Worldwide Certification Solution Inc., (China) test personnel.			
M. UNCERTAINTY:	0.0001 mW/cm2			

Test equipments list:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Microwave test instrument	Holaday	HI-1710A	00049254	12/26/2007	12/25/2008
Probe	Holaday	HI-2623	00056803	12/26/2007	12/25/2008
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).					

SIGNED BY:

Eddy ENGINEER

REVIEWED BY:

SENIOR ENGINEER

Radiation Hazard Test Set-up :



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ATTACHMENT 2 - INPUT POWER MEASUREMENT

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18		
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)		
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office		
TEMPERATURE:	22 °C	HUMIDITY:	60%RH		
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord		
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10		
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 FCC Part 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 ampmeter 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 ECMG Worldwide Certification Solution Inc., (China) test personnel.				
M. UNCERTAINTY :	± 5W				

Test Data:

Input Voltage	Input Current	Measured Input	Rated Input Power
(Vac/Hz)	(amps)	Power (watts)	(watts)
120/60	11.56	1312	1350

Test equipments list :

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due	
Power frequency test system	Ainuo	AN8716PX	058704273	06/12/2007	06/12/2008	
Note: All testing wave performed using internationally recognized standards. All test instruments						

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

SIGNED BY:

ENGINEER

Eddy

REVIEWED BY:

Nen 1/am

SENIOR ENGINEER

Input Power Test Set-Up :



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ATTACHMENT 3 - RF OUTPUT POWER MEASUREMENT

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18		
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)		
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office		
TEMPERATURE:	22°C	HUMIDITY:	60%RH		
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord		
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10		
TEST REFERENCE:	ANSI C63.4: 2003, FCC/OST	MP-5:1986			
TEST PROCEDURE:	power Measurement. The C output power. The initial terr water load in a beaker was	aloric Method was used operature of the water los s located in the center power for 120 seconds, in milliliters)(temperature			
TESTED RANGE:	N/A				
TEST VOLTAGE:	120VAC / 60Hz				
RESULTS:	RF Output Power = 616 watts	6			
	The test results relate only to the equipment under test provided by client.				
Changes or Modifications:	There were no modifications installed by ECMG Worldwide Certification Solution Inc., (China) test personnel.				
M. UNCERTAINTY:	± 0.3°C				

Test Data:

Quality of Water	Starting	Final	Elapsed Time	RF Output
(ml)	Temperature (\mathcal{C})	Temperature (°C)	(Seconds)	Power (watts)
1000	23.9	41.5	120	616.0

Test equipments list :

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due		
Data Acquisition	TES	TES-1310	020907011	12/03/2007	11/03/2008		
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).							

SIGNED BY:

Engineer

REVIEWED BY:

from Wen

SENIOR ENGINEER

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RF Output Power Test Set-Up :



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ATTACHMENT 4 - OPERATING FREQUENCY MEASUREMENT

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18	
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)	
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office	
TEMPERATURE:	22°C	HUMIDITY:	60%RH	
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord	
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10	
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 FCC Part 18 for Operating Frequency Measurement. 1) The variation of frequency with time. The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000ml water load in a beaker was located in the center of the oven. Set a spectrum analyzer with antenna at 3 meters distance form 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 percent of the original load. 2) The variation of 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. 			
TESTED RANGE:	2450 ± 50MHz			
TEST VOLTAGE:	120VAC / 60Hz			
RESULTS:	Please refer to following pages for details of the variation in operating frequency with time & line voltage measurement. The test results relate only to the equipment under test provided by client.			
Changes or Modifications:	There were no modifications Inc., (China) test personnel.	s installed by ECMG Wo	rldwide Certification Solution	
M. UNCERTAINTY:	Freq. ±10kHz			

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Variation	in O	peratina	Freauen	cv with	Time:
		p e			

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2458.8	2459.3

Variation in Operating Frequency with Line Voltage:

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2456.3	2466.1
Note: Line voltage varied from 96Vac to 150Vac.	

Test equipments list :

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Bilog Antenna	Chase	CBL6112B	SB3440	01/25/2007	01/24/2008
Horn Antenna	R&S	HF906	SB3434	01/25/2007	01/24/2008
EMI Receiver	R&S	ES126	SB3436	01/25/2007	01/24/2008
3M Anechoic chamber	Albatross	9x6x6	SB3450	03/27/2007	03/27/2008

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

SIGNED BY:

Goldy ENGINEER

REVIEWED BY:

Wom Wen

SENIOR ENGINEER

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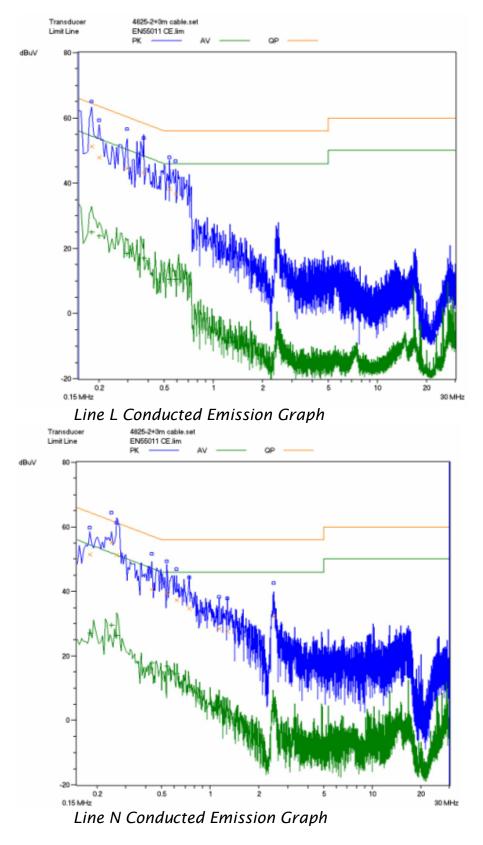
Operating Frequency Test Set-up :

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ATTACHMENT 5 - CONDUCTED EMISSION TEST RESULTS

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18		
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)		
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office		
TEMPERATURE:	22°C	HUMIDITY:	60%RH		
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord		
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10		
TEST REFERENCE:	ANSI C63.4: 2003, FCC/OST MP-5:1986				
TEST PROCEDURE:	for conducted emissions. The an EMI receiver peak scan was six highest significant peaks	he measurement was us was made at the frequent were then marked, and th	SI C63.4: 2003 & FCC MP-5 ing a AMN on each line and cy measurement range. The ese signals were then quasi- tigated was from 150kHz to		
TESTED RANGE:	150kHz to 30MHz				
TEST VOLTAGE:	120VAC / 60Hz				
RESULTS:	The EUT meets the requirements of test reference for Conducted Emissions on line N by 6.4 dB of Average detector. The test results relate only to the equipment under test provided by client.				
Changes or Modifications:	There were no modifications installed by ECMG Worldwide Certification Solution Inc., (China) test personnel.				
M. UNCERTAINTY:	±2.5 dB				





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Test data:

Line L/N	Frequency (MHz)	Corrected QP Level (dBuV)	Limits QP (dBuV)	Margin QP (dB)	Corrected AVE Level (dBuV)	Limits AVE (dBuV)	Margin AV (dB)
L	0.1526	58.60	65.85	-7.25	34.10	55.85	-21.75
L	0.1799	54.20	64.49	-10.29	29.20	54.49	-15.29
L	0.5391	41.10	56.00	-14.90	15.50	46.00	-30.50
N	0.265	54.60	61.27	-6.67	38.20	44.60	-6.40
N	0.535	38.80	56.00	-17.20	14.0	46.00	-32.00
N	2.4446	32.90	56.00	-23.70	5.50	46.00	-4.50
Note: A	Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time.						

Test equipments list:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due	
EMI Receiver	R&S	ESCS30	SB2603	01/25/2007	01/24/2008	
AMN R&S ESH2-Z5 SB3321 01/25/2007 01/24/2						
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).						

SIGNED BY:

ENGINEER

6 de

REVIEWED BY:

from Wen

SENIOR ENGINEER

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Conducted Emission Test Set-up :



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ATTACHMENT 6 - RADIATED EMISSION TEST RESULTS

CLIENT:	Guangdong Galanz Enterprises Co. Ltd	TEST STANDERD:	FCC Part 18	
MODEL NUMBERS:	P9023X-Z	PRODUCT:	Microwave Oven (Counter-top)	
MODEL TESTED:	P9023AP-BM1	EUT DESIGNATION:	Home or Office	
TEMPERATURE:	22 ℃	HUMIDITY:	60%RH	
ATM PRESSURE:	101.1kPa	GROUNDING:	Through AC Power Cord	
TESTED BY:	Eddy Chen	DATE OF TEST:	2008, Jan 10	
TEST REFERENCE:	ANSI C63.4: 2003, FCC/OST MP-5:1986			
TEST PROCEDURE:	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 1.0 m above the ground. The table is placed on a flush mounted metal turntable.			
	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.			
	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:			
	FS= RA + AF + CF - AG			
	Where: FS = Field Strength			
	RA = Receiver Amplitude			
	AF = Antenna Factor			
	CF = Cable Attenuation Factor			
	AG = Amplifier Gain			
TESTED RANGE:	30MHz to 25GHz			
TEST VOLTAGE:	120VAC / 60Hz			
RESULTS:	The EUT meets the requirements of test reference for Radiated Emissions on Horizontal polarization by 9.24 dB of QP detector at 256.8 MHz. The test results relate only to the equipment under test provided by client.			
Changes or Modifications:	There were no modifications installed by ECMG Worldwide Certification Solution Inc., (China) test personnel.			
M. UNCERTAINTY:	± 3.2 dB			

Field strength limits for out-of-band emissions :

For RF output power <500W, Limit at 300m = 27.96dBuV/m For RF output power>5 00W, Limit at 300m=20log[25*SQRT(Power/500)]dBuV/m

est Dutu.					
30MHz – 1GHz					
Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, QP [dB]	3 Meters Limits [dBµV/m]	
47.2	н	47.12	-21.74	68.86	
246.4	н	34.04	-34.82	68.86	
256.8	н	59.62	-9.24	68.86	
41.2	V	51.96	-16.90	68.86	
47.2	V	49.83	-19.03	68.86	
245.2	V	34.65	-34.21	68.86	
		1			

Test Data :

Note: All readings are quasi-peak unless stated otherwise, using a bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.

1*GHz* – 25*GHz*

Frequency [GHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, AV [dB]	3 Meters Limits [dBµV/m]	
2.201	Н	28.59	-40.27	68.86	
4.914	Н	48.13	-20.73	68.86	
8.283	Н	40.28	-28.58	68.86	
2.192	V	27.03	-41.83	68.86	
4.908	V	47.31	-21.55	68.86	
8.273	v	39.58	-29.28	68.86	
Note: All readings are average unless stated otherwise, using a bandwidth of 1MHz, with					

a 30 ms sweep time. A video filter was not used.

Test equipments list:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Bilog Antenna	Chase	CBL6112B	SB3440	01/25/2007	01/24/2008
Horn Antenna	R&S	HF906	SB3434	01/25/2007	01/24/2008
EMI Receiver	R&S	ES126	SB3436	01/25/2007	01/24/2008
3M Anechoic chamber	Albatross	9x6x6	SB3450	03/27/2007	03/26/2008

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

Edd SIGNED BY: ENGINEER

REVIEWED BY:

Nen

SENIOR ENGINEER

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Radiated Emission Test Set-up (30~1000MHz) :

Radiated Emission Test Set-up (1~25GHz) :



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