



FCC PART 18 MEASUREMENT AND TEST REPORT

For

Guangdong Galanz Enterprise Co., Ltd.

25 Ronggui Nan.Rd., Shunde, Foshan, Guangdong.

FCC ID: UHW9030002

This Report Concerns:		Equipment Type: Microwave Oven
Test Engineer:	William Chan William . Chan .	
Report No.:	RSZ07091853	
Test Date:	2005-07-05 to 2005-07-07	
Report Date:	2007-09-29	
Reviewed By:	EMC Manager: Boni Baniqued	
Prepared By:	1	ng, China 018

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The Guangdong Galanz Enterprise Co., Ltd.'s model: WP1000AP30-3 or the "EUT" as referred to in this report is a Microwave Oven which measures approximately 52.5cmL x 44.5cmW x 28.5cmH, rated input voltage: AC 120V/60Hz.

The series products, model WP900/1000(XY)- Z,

(X=J,SJ,AJ,ASJ,L,SL,ASLAL,ESL,EL,FSL,FL,AP,ASP,ESP,EPY=30,38Z='Z' mean suffix ,and the suffix maybe blank or maybe from 0 to 9 and from A to Z , the suffix could be from two digits to five digits to denote cosmetic difference). The model WP1000AP30-3 to test.

Objective

The following test report is prepared on behalf of *Guangdong Galanz Enterprise Co.*, *Ltd.* in accordance with Part 2, Subpart J, and Part 18, Subparts A, B and C of the Federal Communication Commissions rules and regulations.

The objective of the manufacturer is to determine compliance with FCC Part 18 limits.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with MP-5, FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment, February 1986. All measurement was performed at Bay Area Compliance Laboratory Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratory Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

^{*} The test data gathered are from production sample, serial number: 0507101, provided by the manufacturer

Additionally, Bay Area Compliance Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm.

SYSTEM TEST CONFIGURATION

Justification

The EUT was provided for tests as a stand-alone device. It was prepared for testing in accordance with the manufacturer's instructions. The EUT was operated at maximum (continuous) RF output power. The loads consisted of water in a glass beaker in the amounts specified in the test procedure.

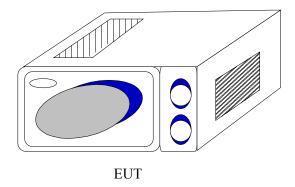
Equipment Modifications

Bay Area Compliance Laboratory Corp. (Shenzhen) has not done any modification on the EUT.

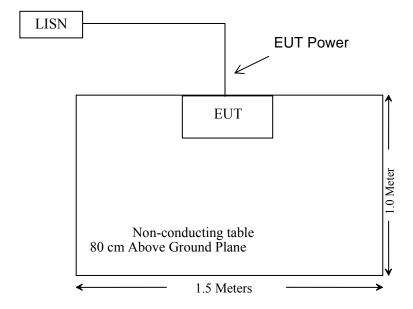
External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded Undetachable AC Line	1.0	EUT	AC Power

Configuration of Test Setup



Block Diagram of Test Setup



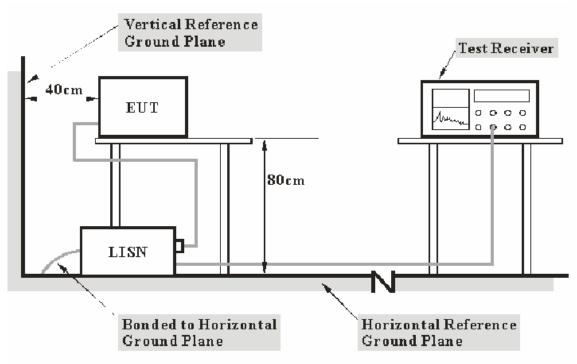
CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is ±2.4 dB.

EUT Setup



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with MP-5: 1986 measurement procedure. Specification used was with the FCC Part 18 limits.

The EUT was connected to a 120 VAC/ 60Hz power source.

EMI Test Receiver Setup

The test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12008	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2005-1-26	2006-1-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2005-2-28	2006-2-28

^{*} Com-Power's LISN were used as the supporting equipment.

Test Procedure

During the conducted emission test, the EUT power cord was connected to the outlet of the LISN.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 18, with the worst margin reading of:

3.40 dB at **13.165 MHz** in the **Neutral** conductor mode.

^{*} **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	94.0 kPa

Testing was performed by William Chan on 2005-7-5.

Test mode: MAX Power

	LINE CONDUCTED EMISSIONS			FCC I	Part 18
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dΒμV	QP	Line/Neutral	dΒμV	dB
13.165	56.50	QP	Neutral	60.00	3.50
29.200	55.90	QP	Line	60.00	4.10
15.775	55.50	QP	Line	60.00	4.50
14.555	53.40	QP	Neutral	60.00	6.60
12.790	51.20	QP	Line	60.00	8.80
24.440	47.80	QP	Neutral	60.00	12.20
0.370	38.00	QP	Neutral	58.50	20.50
0.370	27.70	AV	Neutral	48.50	20.80
0.860	34.10	QP	Neutral	56.00	21.90
0.355	36.70	QP	Line	58.84	22.14
0.355	26.30	AV	Line	48.84	22.54
0.150	43.20	QP	Line	66.00	22.80
0.860	33.20	QP	Line	56.00	22.80
0.860	21.40	AV	Neutral	46.00	24.60
0.160	40.80	QP	Neutral	65.46	24.66
13.165	24.80	AV	Neutral	50.00	25.20
0.860	20.60	AV	Line	46.00	25.40
12.790	22.80	AV	Line	50.00	27.20
15.775	21.70	AV	Line	50.00	28.30
14.555	20.70	AV	Neutral	50.00	29.30
24.440	16.20	AV	Neutral	50.00	33.80
29.220	13.10	AV	Line	50.00	36.90
0.150	15.56	AV	Line	56.00	40.44
0.160	14.40	AV	Neutral	55.46	41.06

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

EUT: Microwave oven M/N:WP1000AP30-3

Manuf: GALANZ

Op Cond: Max power

Operator: william

Test Spec: AC 120V/60Hz L

Comment: Temp:28

Temp:28 Humi:57%

Date: 05. Jul 05 09:26

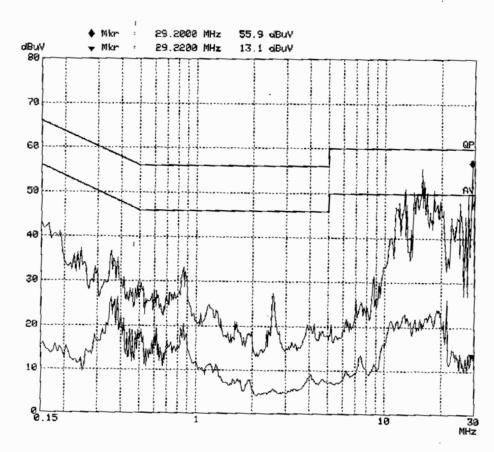
Scan Settings (1 Range)

Start Stop Step IF BW Detector M-Time Atten Preamp
150k 30M 5k 9k PK+AV 10ms AUTO LN OFF

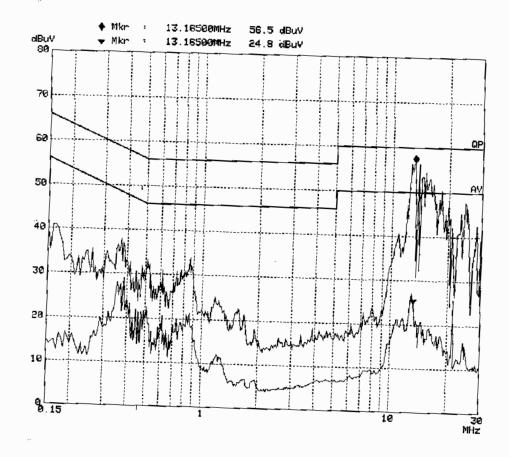
Transducer No. Start Stop Name
1 9k 30M BSH3

Final Measurement: x QP / + AV

Meas Time: 1 s Subranges: 25 Acc Margin: 6dB



EUT: Microwave oven M/N:WPl000AP30-3 Manuf: GALANZ Op Cond: Max power Operator: william Test Spec: AC 120V/60Hz N Comment: Temp:28 Humi:57% Date: 05. Jul 05 09:12 Scan Settings (1 Range) ----- Frequencies -----| |----- Receiver Settings -----Start Stop Step IF BW Detector M-Time Atten Preamp 150k 3 OM 9k PK+AV 10ms AUTO LN OFF Transducer No. Start Stop 1 9k MOE ESH3 Final Measurement: x QP / + AV Meas Time: Subranges: 25 Acc Margin: 6dB



RADIATION HAZARD MEASUREMENT

Environmental Conditions

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	117.5 kPa

Testing performed by William Chan on 2005-07-05

Radiation Hazard Measurement

Radiation leakage was measured in the as-received condition with the oven door closed using a microwave leakage meter.

A 1000ml water load was placed in the center of the oven and the oven was operated at maximum output power.

There was no microwave leakage exceeding a power level of 0.69mWfcm² 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 Federal Standards. Hence, microwave leakage in the as-received condition with the oven door closed was below the maximum allowed.

Input Power

Input power and current was measured using a power analyzer. A 1000ml water load was placed in the center of the oven and the oven was operated at maximum output power. A 1000ml water load was chosen for its compatibility with the procedure commonly used by manufacturers to determine their input ratings.

Input Voltage (Vac/Hz)	Input Current (amps)	Measured Input Power (watts)	Rated Input Power (watts)
120/60	12.02	1408.74	1450

Based on the measured input power, the EUT was found to be operating within the intended specifications.

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 1000watts output, each quantity was increased by 50% for each 500watts or fraction thereof in excess of 1000watts. 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.

The RF output power is rated at 1000 watts

Load used for power output measurement = 1000 milliliters of water Load used for frequency measurement = 1000 milliliters of water Load used for harmonic measurement = 700 & 300 milliliters of water Load used for other measurement = 700 milliliters of water

RF Output Power Measurement

The Caloric Method was used to determine maximum RF output power. The initial temperature of the water load was measured. The water load was placed in the center of the oven. The oven was operated at maximum output power for 200 seconds, the temperature of the water was re-measured.

Quality of Water (ml)	Starting Temperature (°C)	Final Temperature (°C)	Elapsed Time (Seconds)
1000	27	72	200

Power = (4.2 joules/calorie)(volume in milliliters)(temperature rise)/(time is seconds)

Power = 4.2 joules/calorie x 1000 x (72-27) / 200

Power =945 watts

The measurement output power was found to be less than 500watts. Therefore, in accordance with Section 18.305 of Subpart-C, the measured out-of-band emissions were compared to the limit of $25\mu V/meter$ at a 300-meter measurement distance.

The measured output power was found to exceed 500watts. Therefore, in accordance with Section 18.305 of Subpart-C, the measured out-of0band emissions were compared with the limit calculated as following:

LFS = 25*SQRT(Power Output/500)

LFS = 25 * SQRT(945/500)

LFS ≈ 34.37

Where: LFS is the maximum allowable field strength for out-of-band emissions in $\mu V/meter$ at a 300-meter measurement distance. Power Output is the measured output power in watts.

Manufacturer	Model	LFS	dB(μV/M)	dB(μV/M)®3m
Guangdong Galanz Enterprise Co., Ltd.	WP1000AP30-3	34.37	30.72	70.72

Operating Frequency Measurement

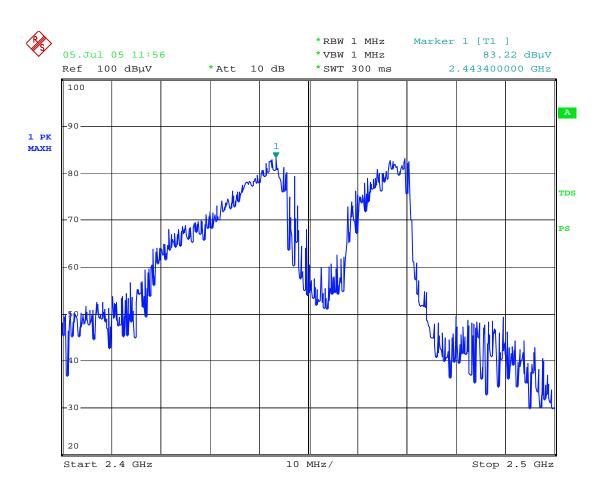
Variation in Operating Frequency with Time

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000ml 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 percent of the original load.

The results of this test are as follows:

Manufacturer	Model	Minimum Frequency (MHz)	Maximum Frequency (MHz)
Guangdong Galanz Enterprise Co., Ltd.	WP1000AP30-3	2441.2	2443.4

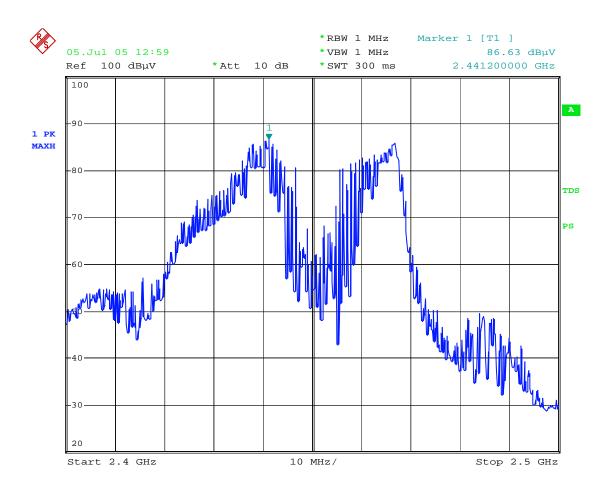
Refer to data pages for details of the variation in operating frequency with time measurement.



GALANZ Microwave oven WP1000AP30-3 Operation frequency VS Ti

me (start)

Date: 5.JUL.2005 11:56:38



GALANZ Microwave oven WP1000AP30-3 Operation frequency VS Ti

me (end)

Date: 5.JUL.2005 12:59:46

Variation in Operating Frequency with Line Voltage

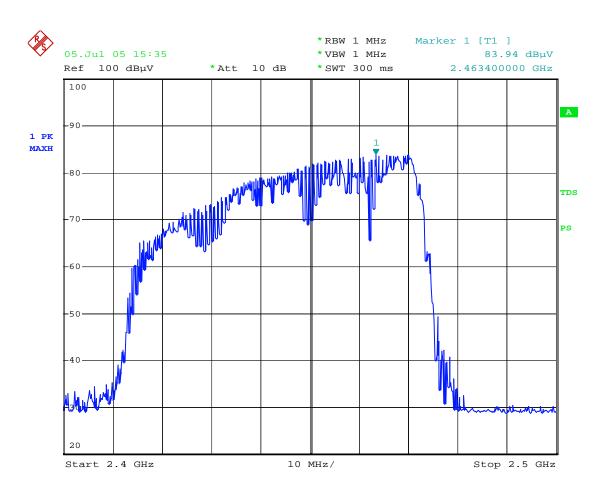
The EUT was operated / warmed by at least 10 minutes of use with a 1000ml water load at room temperature at the beginning of the test. Then the operating frequency was monitored as the input voltage was varied between 80 and 125 percent of the nominal rating.

The results of this test are as follows:

Line voltage varied from 96Vac to 150Vac.

Manufacturer	Model	Minimum Frequency (MHz)	Maximum Frequency (MHz)
Guangdong Galanz Enterprise Co., Ltd.	WP1000AP30-3	2463.4	2468.2

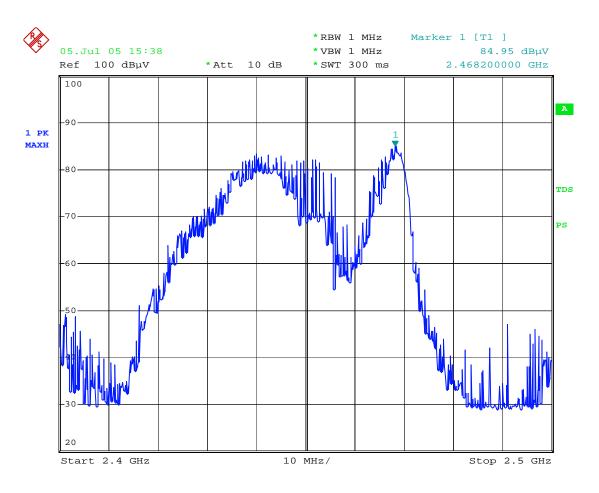
Please refer to following pages for details of the variation in operating frequency with line voltage measurement.



GALANZ Microwave oven WP1000AP30-3 Operation frequency VS Vo

ltage (start)

Date: 5.JUL.2005 15:35:56



GALANZ Microwave oven WP1000AP30-3 Operation frequency VS Vo

ltage (end)

Date: 5.JUL.2005 15:38:51

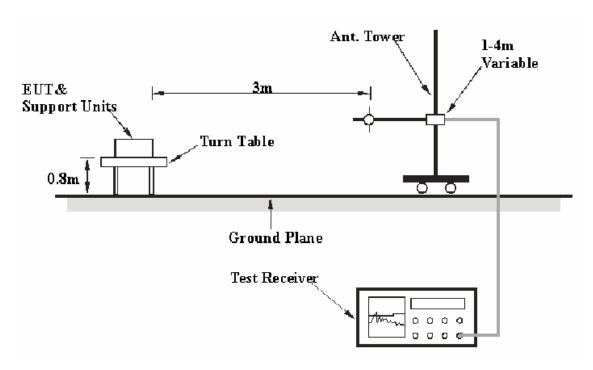
RADIATED EMISSION DATA

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is $\pm 4.0 \text{ dB}$.

EUT Setup



The radiated emission tests were performed in the 3 meters chamber B, using the setup accordance with the FCC MP - 5. The specification used was the FCC part 18 limits.

The EUT was connected to 120 VAC/60 Hz power source.

EMI Test Receiver Setup and Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	R B/W	Video B/W	IF B/W
30 - 1000 MHz	100 kHz	100 kHz	120 kHz
Start Frequency			1 GHz
Stop Frequency			
Sweep Speed			Auto
Video Bandwidth			30 Hz
Resolution Bandwidth			1 MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447D	2994A09795	2004-9-1	2005-8-31
Rohde & Schwarz	Test Receiver	ESCI	100028	2004-9-15	2005-9-15
Sunol Sciences	Bilog Antenna	JB1	A040904-1	2005-4-28	2006-4-28
HP	Amplifier	8449B	3008A00277	2004-9-1	2005-8-31
Sunol Sciences	Horn Antenna	DRH-118	A052604	2004-6-2	2005-6-2
Rohde&Schwarz Spectrum Analyzer		FSEM30	849720/019	2004-11-10	2005-11-10

^{*} **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the power cord of the EUT was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

The EUT was in the normal (naïve) operating mode during the final qualification test to represent the worst results.

All data was recorded in the Quasi-Peak detection mode from 30 MHz to 1GHz and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Limit - Cord. Amp.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 18, with the worst margin reading of:

Max Power (1GHz-25 GHz): **25.57 dB** at **4360.7 MHz** in the **Horizontal** polarization. Max Power (30 MHz-1000 MHz): **15.77 dB** at **63.53 MHz** in the **Vertical** polarization.

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	101.5 kPa

The testing was performed by William Chan on 2005-7-6.

Test mode: Max Power (1GHz-25 GHz)

Indica	TED	TABLE	Ante	NNA	CORRECTION FACTOR			FCC PART 18		
Frequency	Meter Reading	Angle	Height	Polar	Antenna Loss	Cable Loss	Amp. Gain	CORRECTED AMPLITUDE	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	$dB\mu V/m$	dBμV/m	dB
2467.5	108.35	180	1.0	V	29.0	3.7	35.8	105.25		
2466.5	113.5	180	1.2	Н	29.0	3.7	35.8	110.4		
4360.7	42.35	90	1.2	V	33.8	3.6	34.6	45.15	70.72	25.57
8330.6	45.96	45	1.2	V	37.4	6.2	35.5	54.06	70.72	16.66
9852.7	47.25	180	1.2	V	37.8	7.1	35.6	56.55	70.72	14.17
4929.1	52.34	60	1.0	V	33.9	5.2	34.8	56.64	70.72	14.08
6086.1	48.97	90	1.0	Н	37.2	6	34.6	57.57	70.72	13.15
4878.5	53.65	60	1.0	Н	33.9	5.2	34.8	57.95	70.72	12.77
8639.2	49.86	120	1.0	V	37.4	6.2	35.5	57.96	70.72	12.76
7375.5	49.86	90	1.2	V	37.3	6.1	34.5	58.76	70.72	11.96
8569.1	50.68	120	1.0	Н	37.4	6.2	35.5	58.78	70.72	11.94
8527.2	51.27	90	1.2	Н	37.4	6.2	35.5	59.37	70.72	11.35
7407.4	51.25	90	1.2	Н	37.3	6.1	34.5	60.15	70.72	10.57
9750.5	51.22	180	1.0	Н	37.8	7.1	35.6	60.52	70.72	10.20

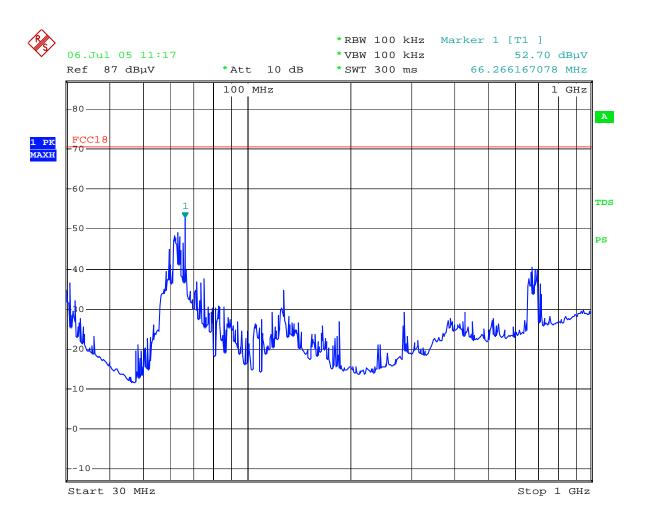
Test mode: Max Power (30 MHz-1000 MHz)

INDICATED TABLE		ANTENNA		CORRECTION FACTOR			FCC PART 18		C PART 18	
Frequency	Meter Reading	Angle	Height	Polar	Antenna Loss	Cable Loss	Amp. Gain	CORRECTED AMPLITUDE	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	$dB\mu V/m$	dBμV/m	dB
63.53	71.73	60	1.2	V	8.1	1.44	26.32	54.95	70.72	15.77
66.26	69.04	45	1.2	Н	8.5	1.48	26.32	52.70	70.72	18.02
66.73	67.94	270	3.8	V	8.5	1.48	26.32	51.60	70.72	19.12
63.09	65.92	60	1	Н	8.1	1.44	26.32	49.14	70.72	21.58
61.77	65.08	90	1	Н	8.1	1.44	26.32	48.30	70.72	22.42
61.77	64.39	180	1	V	8.1	1.44	26.32	47.61	70.72	23.11
59.64	61.93	120	1	Н	7.9	1.49	26.32	45.00	70.72	25.72
132.68	51.4	35	3.8	V	14.5	1.5	25.95	41.45	70.72	29.27
675.20	43.19	45	1	Н	20.6	2.8	26.17	40.42	70.72	30.3
704.22	41.99	180	1.2	V	20.6	2.9	26.09	39.40	70.72	31.32
517.24	42.92	80	1.2	V	18.0	2.58	26.28	37.22	70.72	33.50
128.10	44.71	180	1.2	Н	14.4	1.45	25.98	34.58	70.72	36.14

Plot(s) of Test Data

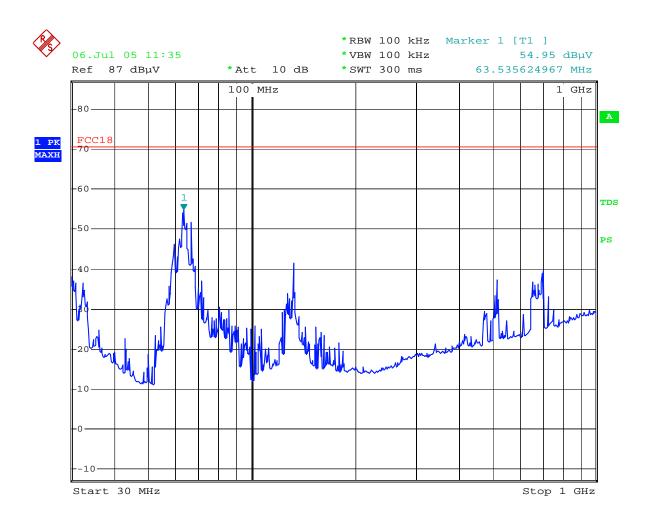
Plot(s) of Test Data is presented hereinafter as reference.

Horizontal



GALANZ Microwave oven WP1000AP30-3 Max power (Horizontal)
Date: 6.JUL.2005 11:17:07

Vertical



GALANZ Microwave oven WP1000AP30-3 $\,$ Max power (Vertical)

Date: 6.JUL.2005 11:35:24

*****END OF REPORT****