

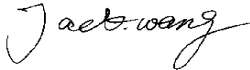
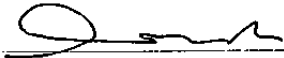
FCC PART 18
EMI MEASUREMENT AND TEST REPORT

For

Whirlpool Microwave Products Development Limited

16/F, Paliburg Plaza, 68 Yee Woo Street, Causeway Bay, Hong Kong

FCC ID: PR4GET2205X

Report Type: Class II Permissive Change	Product Type: Microwave oven
Test Engineer: Jack Wang	
Report No.: RSZ11011251	
Report Date: 2011-01-28	
Reviewed By: Lisa Zhu	
Prepared By:	EMC Engineer
Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Whirlpool Microwave Products Development Limited.*'s model: *KHMS2040* or the "EUT" as referred to in this report is a *Microwave Oven* which measures approximately 76.0cm (L) x 46.0cm (W) x 45.0cm (H), rated input voltage: AC 120 V/60 Hz.

** All measurement and test data in this report was gathered from production sample serial number: 1101034 (Assigned by BACL, Shenzhen). The EUT was received on 2011-01-12.*

Objective

The following test report is prepared on behalf of *Whirlpool Microwave Products Development Limited.* 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.

This is the C2PC application of the device. The difference between the original device and the current one is as follows:

Part	Original	New
Filter	Filter DFCA-2516R-33A44	Filter board

For the changes made to the device, conducted emission testing and Radiated emission (30 to 1 GHz) testing were performed.

Related Submittal(s)/Grant(s)

This is a C2PC application. The original application was granted on 2008-10-14.

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 measurements were performed at Bay Area Compliance Laboratory Corporation. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories 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 Laboratories 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 December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

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.

Additionally, Bay Area Compliance Laboratories 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/Standards/scopes/2007070.htm>

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.

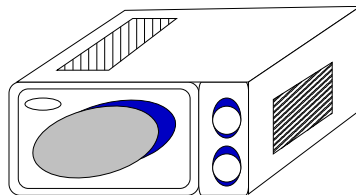
Equipment Modifications

No modifications were made to the unit tested.

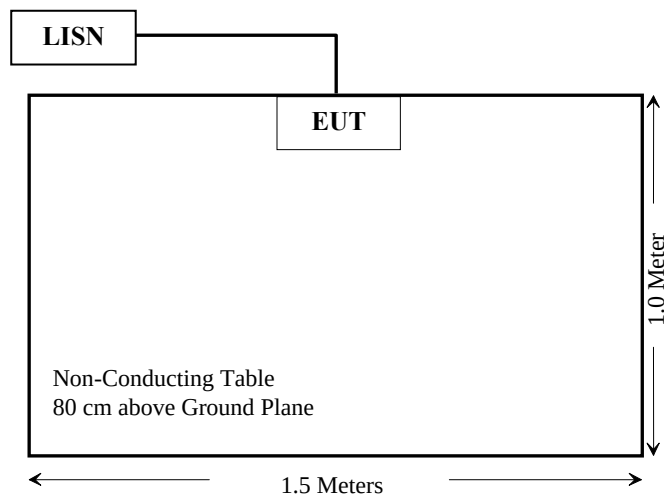
External Cable List and Details

Cable Description	Length (M)	From/Port	To
Unshield Undetachable AC Power Cable	1.05	EUT	LISN

Configuration of Test Setup



Block Diagram of Test Setup



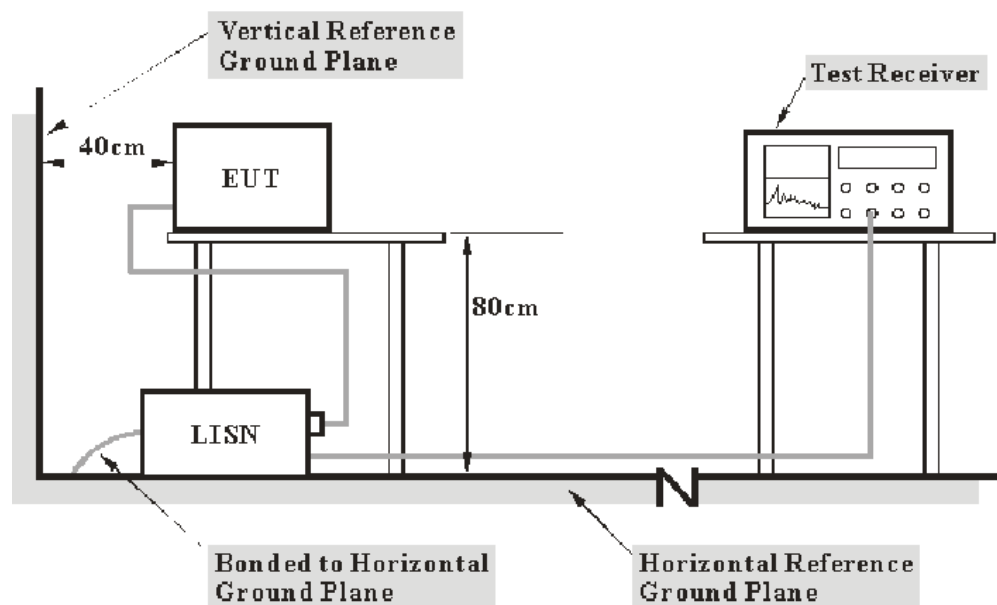
FCC §18.307 – AC LINE CONDUCTED EMISSIONS

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 Laboratories Corp. (Shenzhen) is ± 2.4 dB ($k=2$, 95% level of confidence).

EUT Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 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 per MP-5: 1986 measurement procedure. Specification used was with the FCC Part 18.307.

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

EMI Test Receiver Setup

The EMI 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:

<u>Frequency Range</u>	<u>IF B/W</u>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2010-03-03	2011-03-02
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2010-03-09	2011-03-08

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

Test Procedure

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

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

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 18.307, with the worst margin reading of:

14.08 dB at 0.155 MHz in the **Line** conductor mode.

Test Data

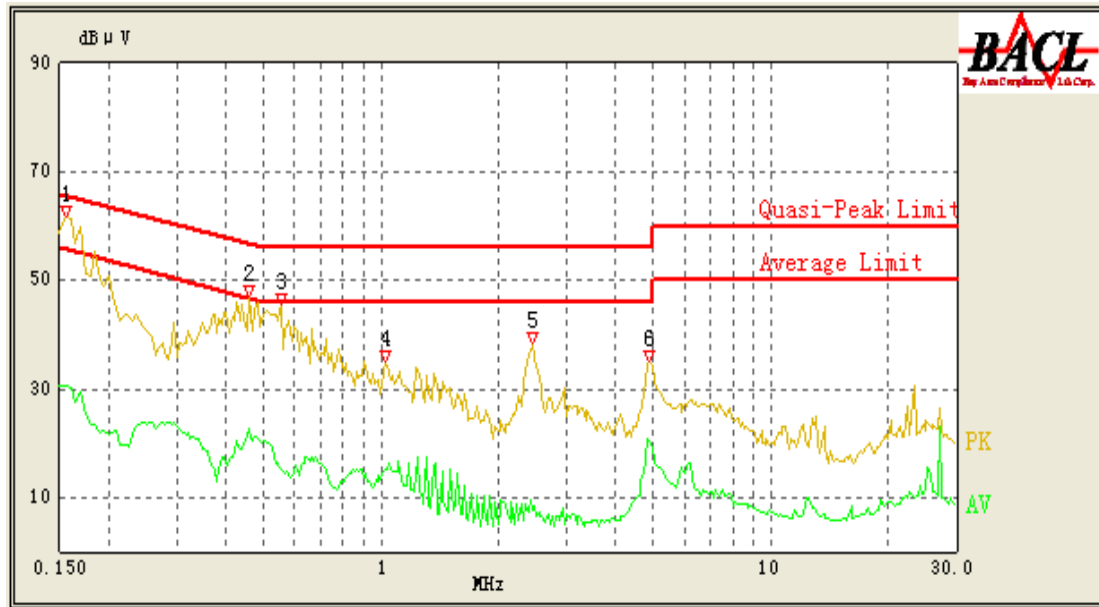
Environmental Conditions

Temperature:	25° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

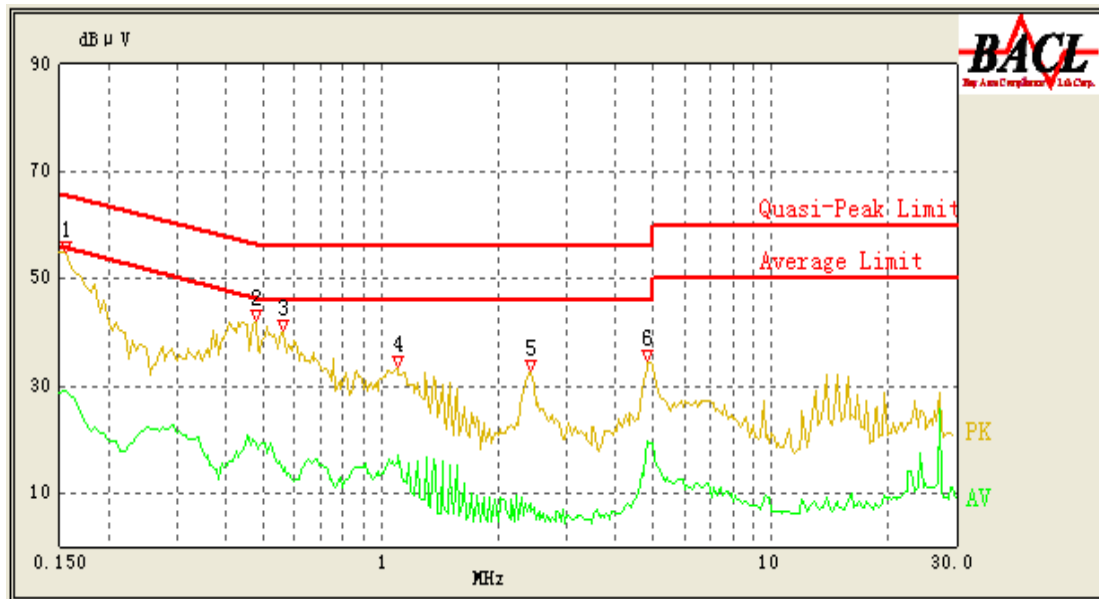
The testing was performed by Jack Wang on 2011-01-20.

Test Mode: Running (Max Power)

AC 120 Vac/60Hz - Line:



Frequency (MHz)	Cord. Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave.)
0.155	51.78	10.10	65.86	14.08	QP
0.460	35.63	10.16	57.14	21.51	QP
0.555	31.86	10.19	56.00	24.14	QP
0.460	22.74	10.16	47.14	24.40	Ave.
4.895	31.55	10.10	56.00	24.45	QP
0.155	30.63	10.10	55.86	25.23	Ave.
4.900	20.19	10.10	46.00	25.81	Ave.
2.460	29.01	10.18	56.00	26.99	QP
0.550	15.52	10.19	46.00	30.48	Ave.
1.035	15.19	10.10	46.00	30.81	Ave.
1.025	24.53	10.10	56.00	31.47	QP
2.470	8.39	10.18	46.00	37.61	Ave.

AC 120 Vac/60Hz – Neutral:

Frequency (MHz)	Cord. Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Remark (PK/QP/Ave.)
0.155	49.35	10.10	65.86	16.51	QP
0.480	34.54	10.18	56.57	22.03	QP
0.560	32.90	10.19	56.00	23.10	QP
4.830	19.85	10.10	46.00	26.15	Ave.
0.155	29.09	10.10	55.86	26.77	Ave.
0.480	19.48	10.18	46.57	27.09	Ave.
4.830	28.50	10.10	56.00	27.50	QP
2.420	25.98	10.18	56.00	30.02	QP
1.105	15.70	10.11	46.00	30.30	Ave.
0.560	13.94	10.19	46.00	32.06	Ave.
1.100	23.87	10.11	56.00	32.13	QP
2.415	8.13	10.18	46.00	37.87	Ave.

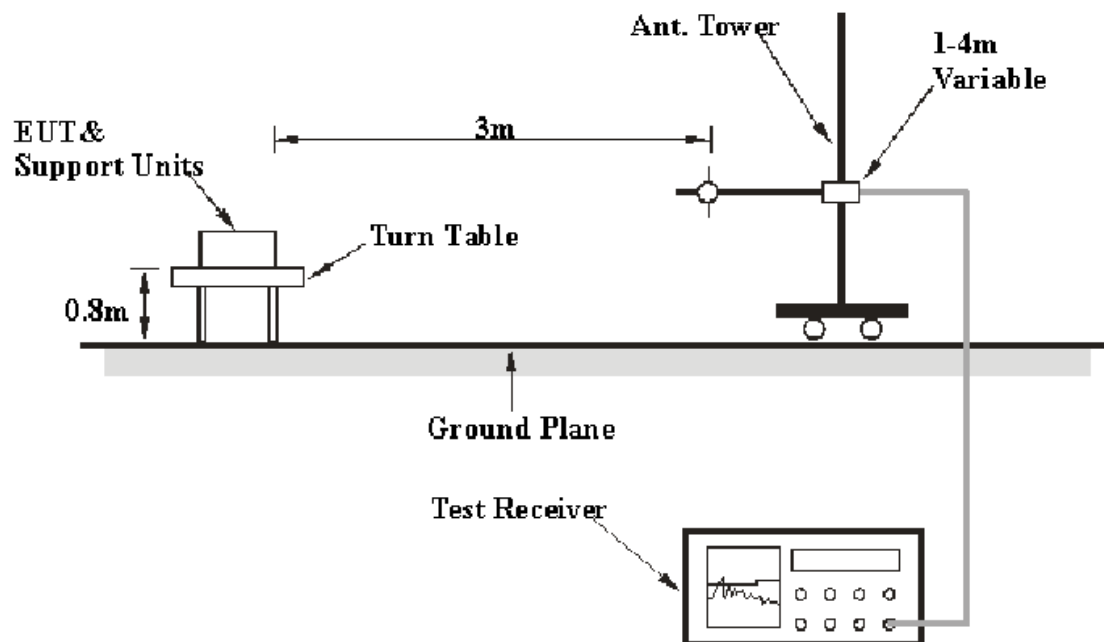
FCC §18.305 – FIELD STRENGTH

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 Laboratories Corp. (Shenzhen) is ± 4.0 dB (k=2, 95% level of confidence)..

EUT Setup



The radiated emission tests were performed in the 3 meters chamber A test site, 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:

<i>Frequency Range</i>	<i>R B/W</i>	<i>Video B/W</i>	<i>IF B/W</i>
30 – 1000 MHz	100 kHz	300 kHz	120 kHz
Above 1GHz	1MHz	10Hz	

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2010-08-02	2011-08-02
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2010-11-24	2011-11-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2010-07-05	2011-07-04

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

For the radiated emissions test, the EUT power cord 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 1 GHz.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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 limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

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:

20.4 dB at 322.162375 MHz in the **Vertical** polarization, 30 MHz-1000 MHz

Test Data and Plots

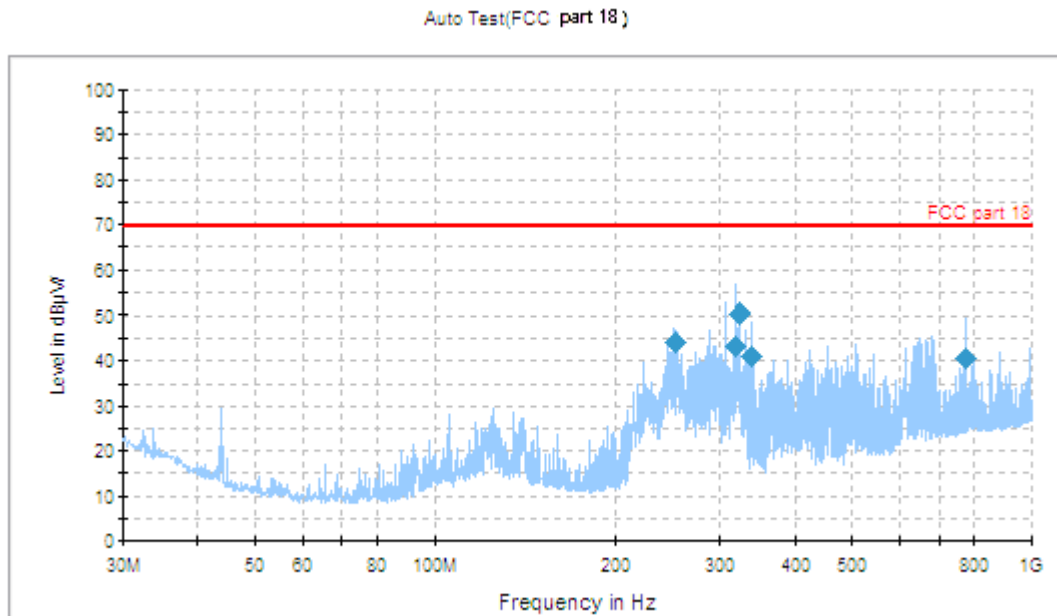
Environmental Conditions

Temperature:	26 ° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa

The testing was performed by Jack Wang on 2011-01-19.

Test Mode: Running (Max Power)

30 MHz-1000 MHz:



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
322.162375	50.5	205.0	V	167.0	-11.8	70.9	20.4
251.274125	44.1	137.0	H	261.0	-13.5	70.9	26.8
319.233625	43.4	323.0	V	187.0	-11.9	70.9	27.5
337.733000	41.0	369.0	H	327.0	-11.4	70.9	29.9
775.248000	40.7	307.0	H	195.0	-2.1	70.9	30.2

Note: The data above 1 GHz refer to original report.

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