



## FCC PART 18

### EMI MEASUREMENT AND TEST REPORT

For

**Whirlpool Microwave Products Development Ltd**

16/F, Paliburg Plaza, 68 Ye Wo Street, Causeway Bay, Hong Kong

FCC ID: PR4MH1170Y

July 28, 2006

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Class II permissive change	<b>Equipment Type:</b> Microwave Oven
<b>Test Engineer:</b> Tiger <i>Tiger</i>	Deny Xiong <i>Deny Xiong</i>
<b>Report Number:</b> RSZ06061553	
<b>Test Date:</b> July 4-20, 2005	
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**Note:** The test report is specially limited to the above company and this particular sample only.  
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(ShenZhen). This report **must not** be used by the client to claim product certification, approval,  
or endorsement by NVLAP, NIST or any agency of the US Government.

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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

The *Whirlpool Microwave Products Development Ltd*'s model: IMH16 Series or the "EUT" as referred to in this report is a Microwave Oven which measures approximately 76.0 cm L x 40.0cm W x 44.0cm H, rated input voltage: AC 120 V/60 Hz.

\* *The test data gathered are from production sample, serial number: TR T 26 10021, provided by the manufacturer, we received the EUT on 2006-6-15.*

### Objective

The following test report is prepared on behalf of *Whirlpool Microwave Products Development Ltd* in accordance with Part 2, Subpart J, and Part 18, Subparts A, B and C of the Federal Communication Commissions rules.

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:

	Alternative HV transformer	Original HV transformer
Model	EDX-JK1013A	EDX-JX1012A

For the changes made to the device, conducted emission testing and Radiated emission testing were performed.

### Related Submittal(s)/Grant(s)

This is a C2PC application. The original application was granted on 2005-12-2.

### 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 Lab 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 518038, P.R.China.

Test site at Bay Area Compliance Lab 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.

Additionally, Bay Area Compliance Lab 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>

### External Cable List and Details

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

## **OPERATING CONDITION/TEST CONFIGURATION**

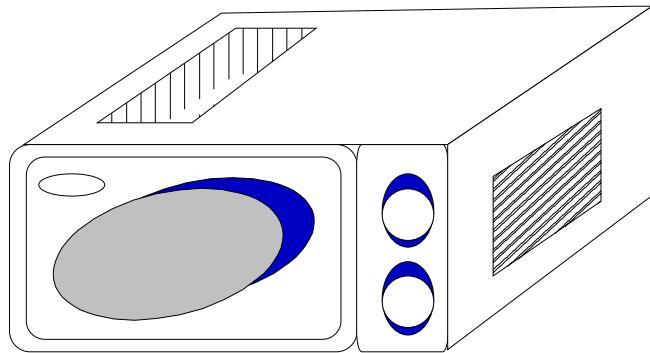
### **Justification**

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.

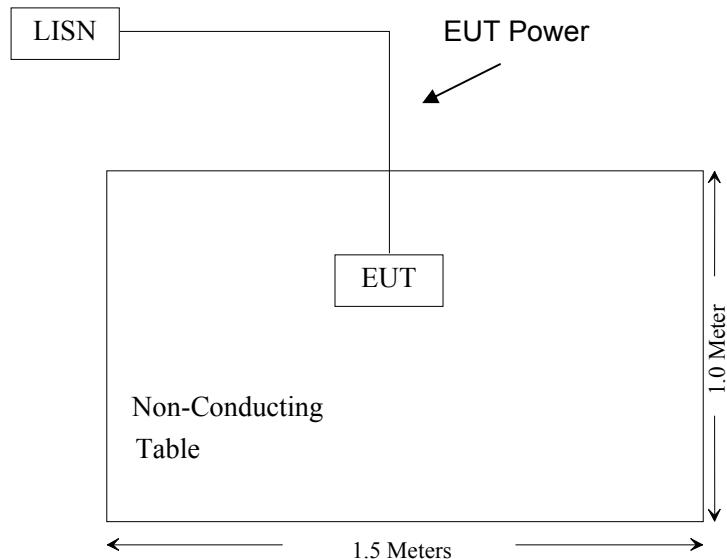
### **Equipment Modifications**

Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

### **Configuration of Test Setup**



### **Block Diagram of Test Setup**



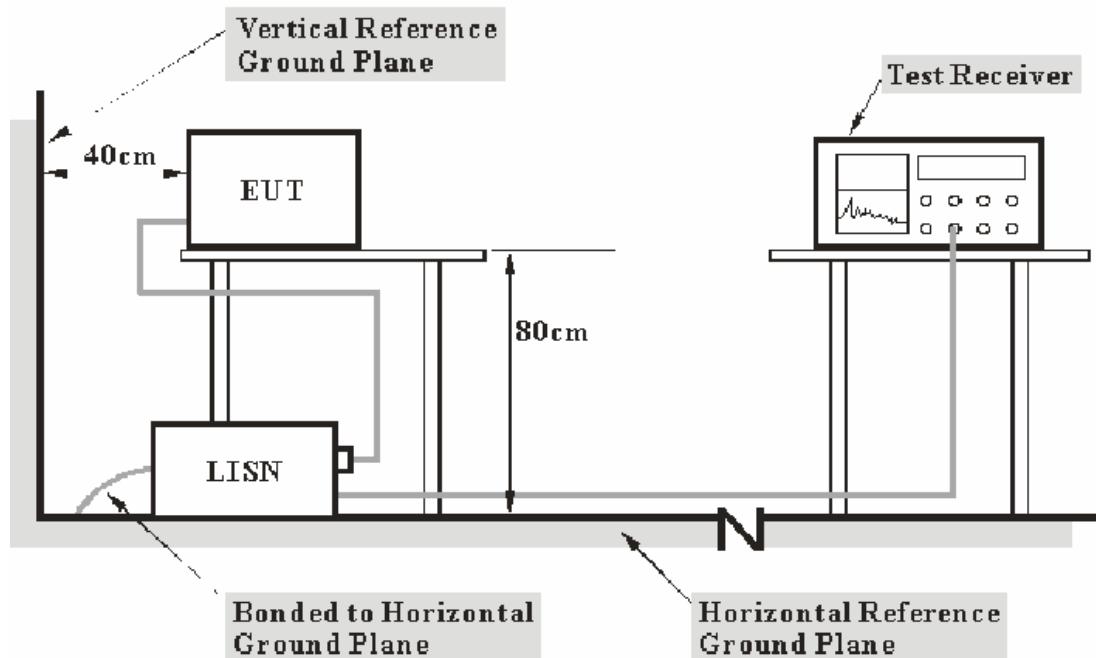
## CONDUCTED EMISSION

### 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 Lab Corp. (ShenZhen) is  $\pm 2.4$  dB.

### 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.

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:

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

## 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.

\* **Statement of Traceability:** Bay Area Compliance Lab 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 were 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, with the worst margin reading of:

**-3.90 dB at 0.870 MHz** in the **Neutral** conductor mode.

## Test Data

### Environmental Conditions

Temperature:	25° C
Relative Humidity:	54%
ATM Pressure:	1000mbar

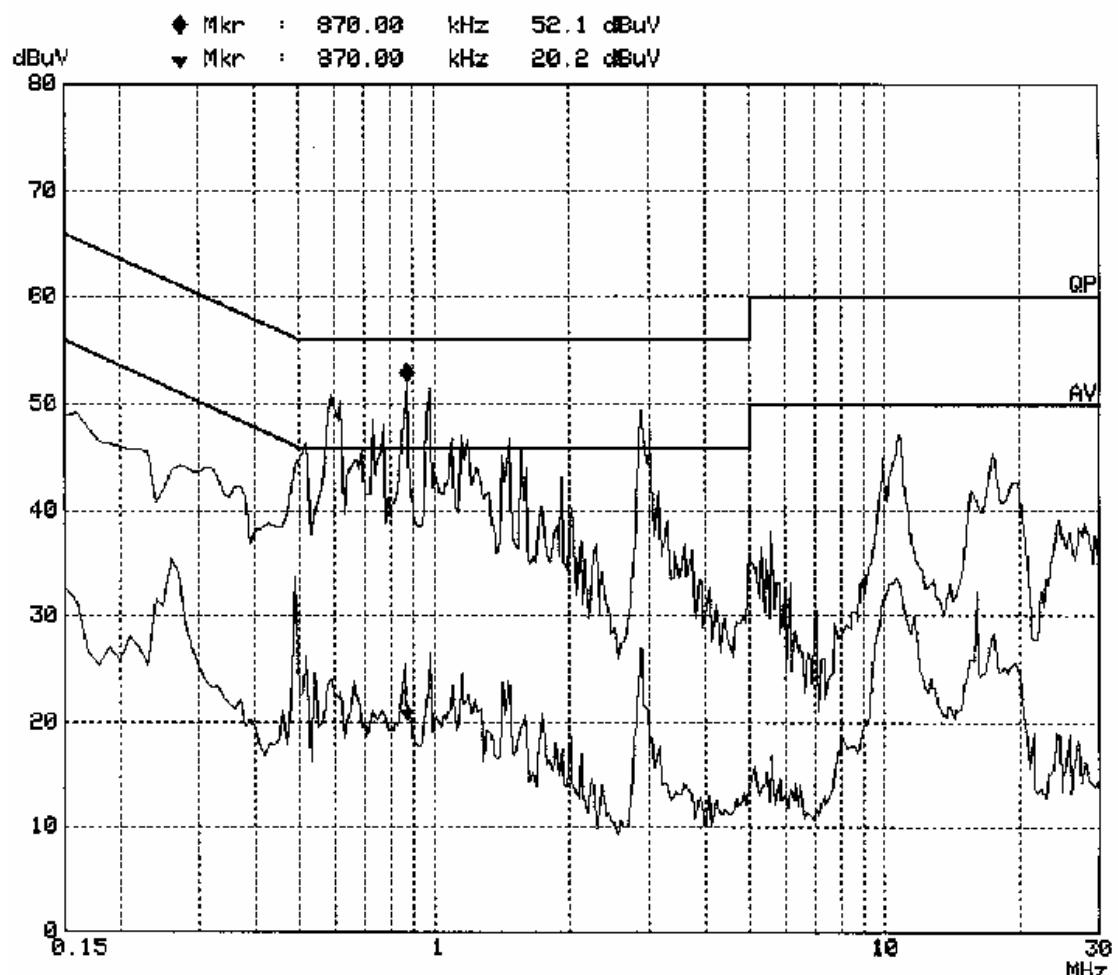
Testing was performed by Tiger on 2006-7-20.

Test mode: MAX Power

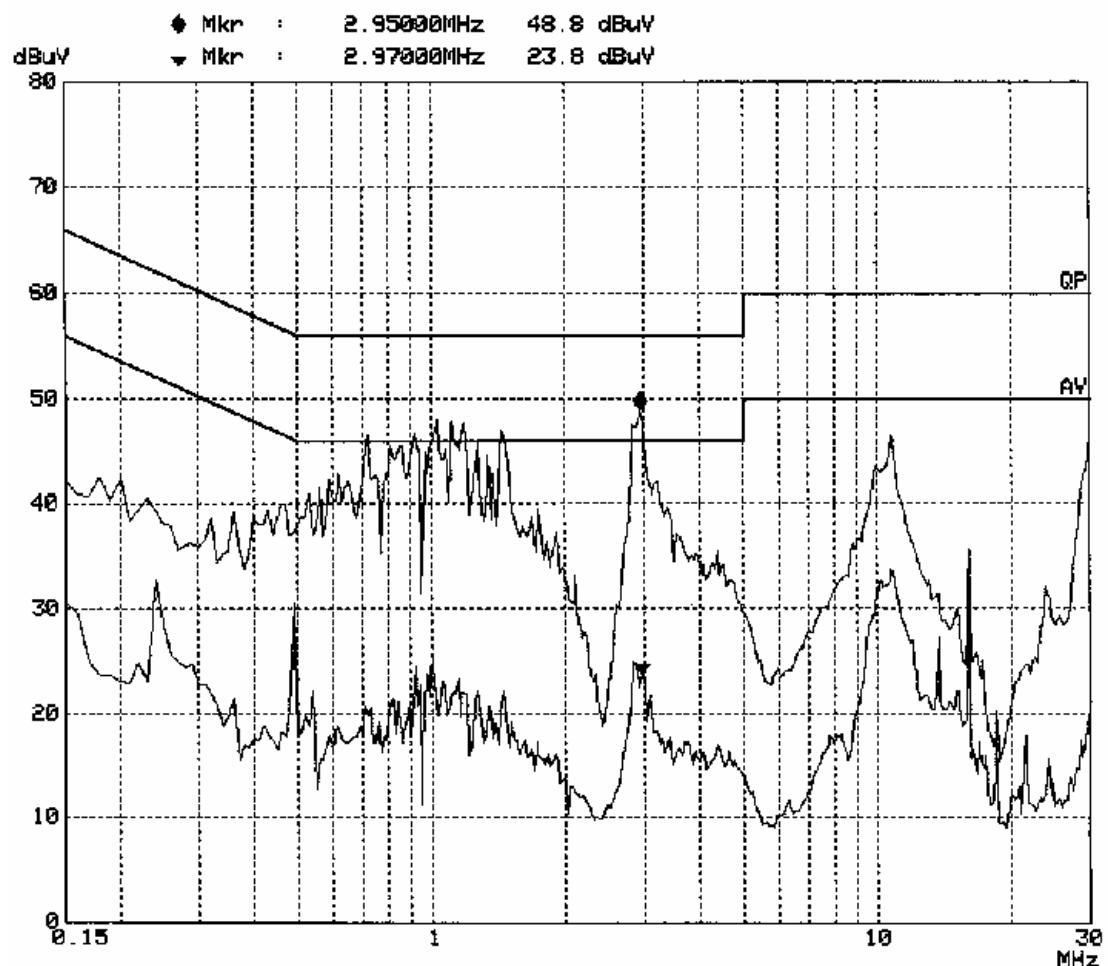
LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB $\mu$ V	QP/AV	Live/Neutral	dB $\mu$ V	dB
0.870	52.10	QP	Neutral	56.00	-3.90
2.880	49.40	QP	Neutral	56.00	-6.60
2.950	48.90	QP	Live	56.00	-7.10
0.730	48.50	QP	Neutral	56.00	-7.50
1.030	48.00	QP	Live	56.00	-8.00
1.150	47.10	QP	Neutral	56.00	-8.90
1.440	47.00	QP	Live	56.00	-9.00
0.720	46.50	QP	Live	56.00	-9.50
0.520	46.40	QP	Neutral	56.00	-9.60
10.760	46.40	QP	Live	60.00	-13.60
10.760	33.50	AV	Live	50.00	-16.50
0.270	44.30	QP	Neutral	61.12	-16.82
0.270	34.00	AV	Neutral	51.12	-17.12
2.880	26.80	AV	Neutral	46.00	-19.20
0.520	26.20	AV	Neutral	46.00	-19.80
0.320	38.60	QP	Live	59.71	-21.11
1.150	24.60	AV	Neutral	46.00	-21.40
2.950	23.90	AV	Live	46.00	-22.10
1.440	22.20	AV	Live	46.00	-23.80
0.730	21.10	AV	Neutral	46.00	-24.90
0.870	20.20	AV	Neutral	46.00	-25.80
0.720	19.90	AV	Live	46.00	-26.10
1.030	19.80	AV	Live	46.00	-26.20
0.320	22.00	AV	Live	49.71	-27.71

### Plot(s) of Test Data

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



EUT: Microwave Oven M/N: IMH16 series  
Manuf: Whirlpool  
Op Cond: Running (max power)  
Operator: Tiger  
Test Spec: AC 120V/60Hz N  
Comment: Temp.:25 Humi.:54%  
Date: 20. Jul 06 09:21



BUT: Microwave Oven M/N: IMH16 series  
Manuf: Whirlpool  
Op Cond: Running (max power)  
Operator: Tiger  
Test Spec: AC 120V/60Hz L  
Comment: Temp.:25 Humi.:54%  
Date: 20. Jul 06 08:27

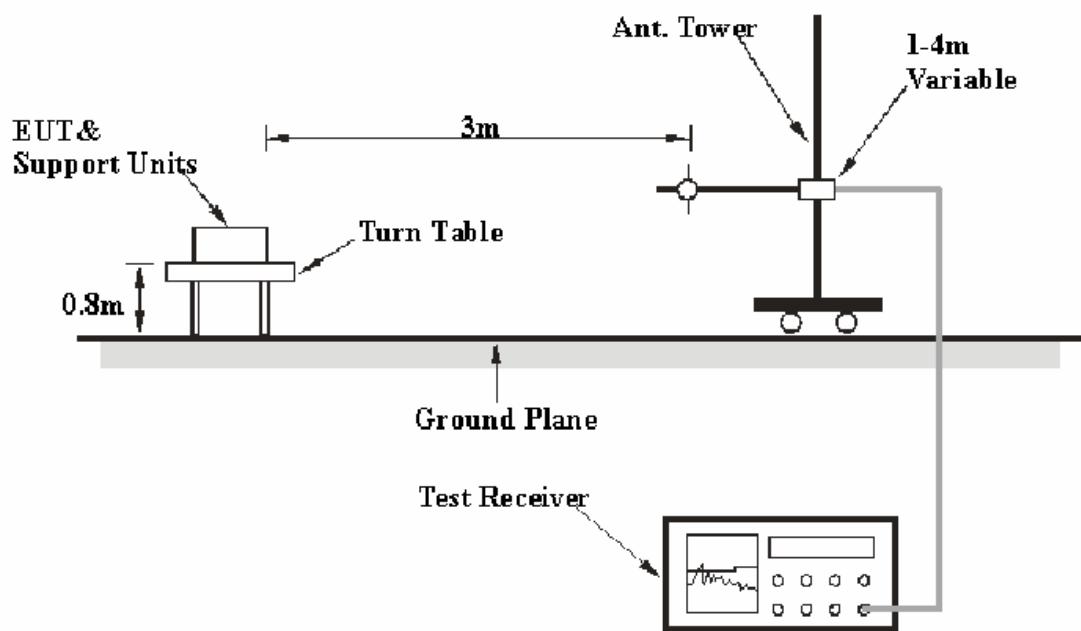
## RADIATED EMISSION DATA

### 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 Lab Corp. (ShenZhen) is  $\pm 4.0$  dB.

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber B 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 1 GHz.

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

<b><i>Frequency Range</i></b>	<b><i>R B/W</i></b>	<b><i>Video B/W</i></b>	<b><i>IF B/W</i></b>
30 – 1000 MHz	100 kHz	300 kHz	120 kHz

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
HP	Amplifier	8447E	1937A01046	2005-8-17	2006-8-17
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2006-4-28	2007-4-28
Sunol Sciences	System Controller	SC99V	041304-1	N/A	N/A

\* **Statement of Traceability:** Bay Area Compliance Lab 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 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 Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

## 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:

**-22.90 dB at 951.50 MHz** in the **Horizontal** polarization.

## Test Data and Plots

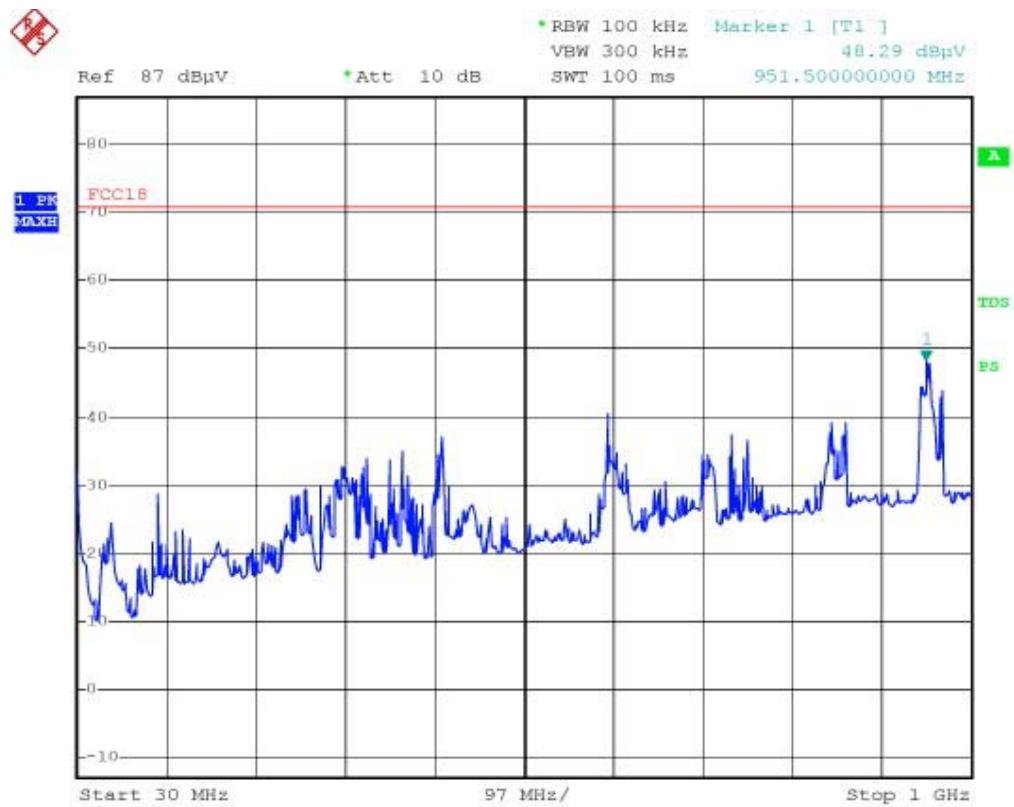
### Environmental Conditions

Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1009 mbar

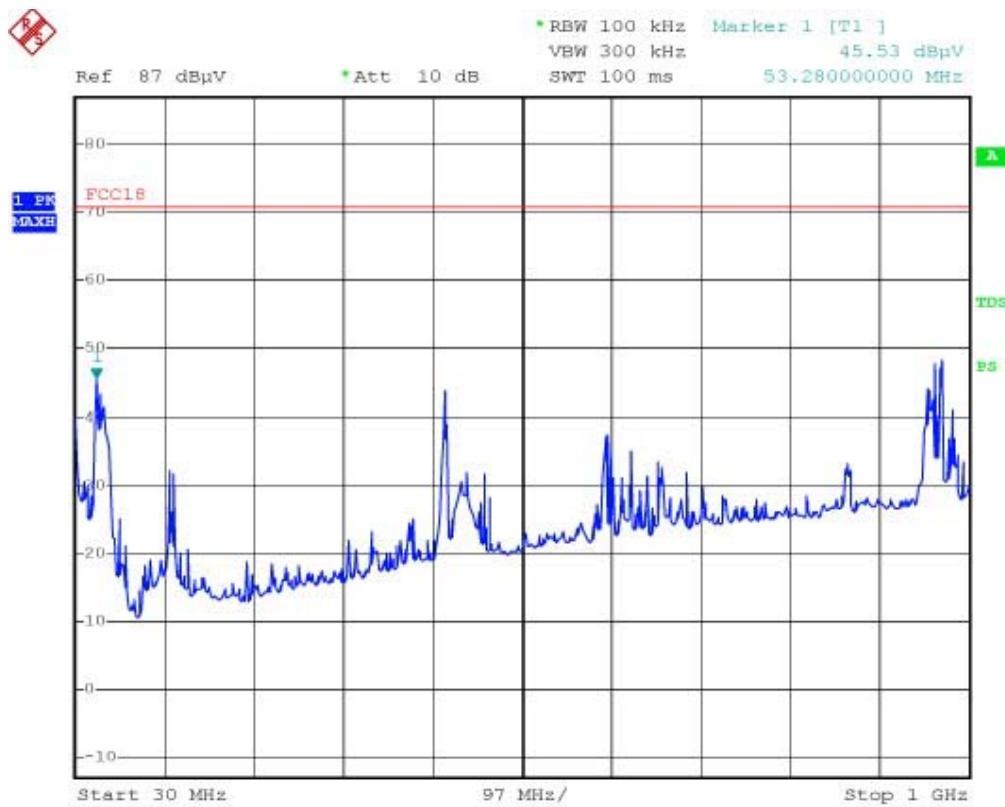
Testing was performed by Deny Xiong on 2006-7-4.

Test mode: MAX Power

Frequency MHz	Meter Reading dBuV/m	Detector PK/QP/AV	Direction Degree	Height Meter	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier Gain dB	FCC Part18		
									Limit dBuV/m	Margin dB	
30 MHz to 1000 MHz											
951.50	47.23	QP	45	1.0	H	23.40	3.84	26.89	47.6	70.5	-22.90
606.30	45.25	QP	180	1.2	H	19.20	3.13	27.38	40.2	70.5	-30.30
426.70	47.46	QP	45	1.2	H	16.80	2.89	27.35	39.8	70.5	-30.70
58.80	53.54	QP	60	1.2	V	7.90	0.52	26.96	35.0	70.5	-35.50
33.09	37.15	QP	45	1.0	V	24.10	0.37	27.02	34.6	70.5	-35.90
954.70	33.75	QP	275	1.6	V	23.40	3.84	26.89	34.1	70.5	-36.40
317.70	41.37	QP	60	1.0	H	14.40	2.61	26.58	31.8	70.5	-38.70
60.50	48.58	QP	35	3.8	V	8.10	0.53	26.91	30.3	70.5	-40.20
616.45	31.59	QP	45	1.2	V	19.10	2.95	27.34	26.3	70.5	-44.20
117.74	36.04	QP	289	1.0	H	13.30	1.03	26.77	23.6	70.5	-46.90
43.43	34.50	QP	289	1.0	H	14.30	0.51	27.01	22.3	70.5	-48.20
464.60	29.35	QP	35	3.8	V	17.40	2.78	27.23	22.3	70.5	-48.20



Date: 4.JUL.2006 09:44:52



Date: 4.JUL.2006 09:47:38