

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: PR4GH7208X

February 28, 2006

This Report Concerns: ☒ Class II permissive change	Equipment Type: Microwave Oven
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Report Number: RSZ05122951	
Test Date: December 30, 2005-February 24, 2006	
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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: GH6208 or the "EUT" as referred to in this report is a microwave oven which measures approximately 76.5 cm L x 46.0cm W x 46.5cm H, rated input voltage: AC 120 V/60 Hz.

* The test data gathered are from production sample, serial number: TR S 53 10002, provided by the manufacturer.

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:

	Original Element	Without Element
Name:	Sirocco Electric Machinery & Glow Tube	Sirocco Electric Machinery & Glow Tube
Function:	Microwave, Grill, FC	FC

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

Related Submittal(s)/Grant(s)

This is a C2PC application. The original application was granted on 2005-8-19.

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 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

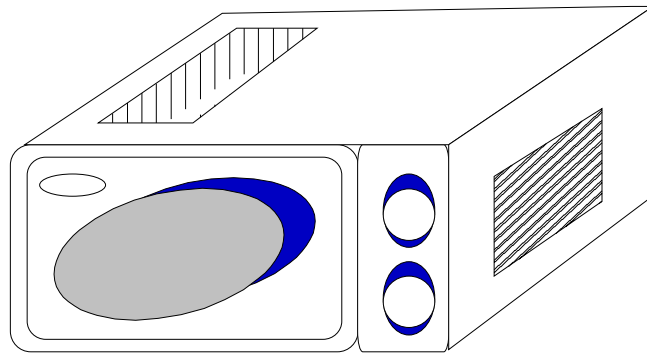
Justification

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.

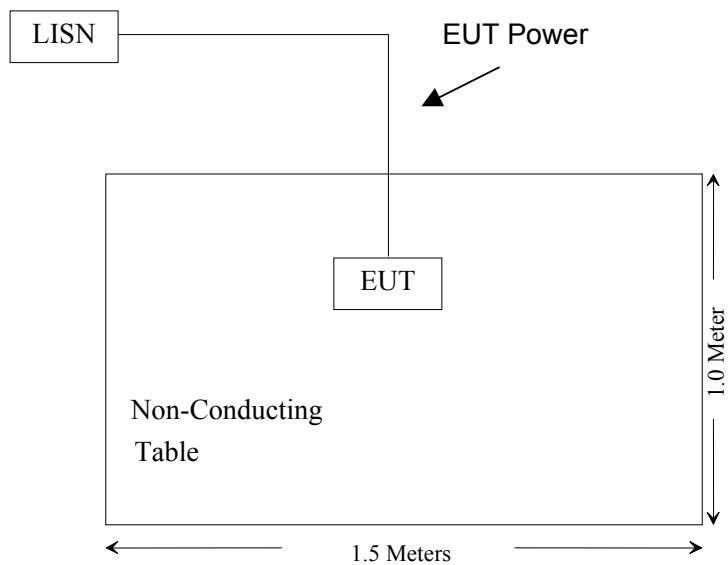
Equipment Modifications

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

Configuration of Test Setup



Block Diagram of Test Setup



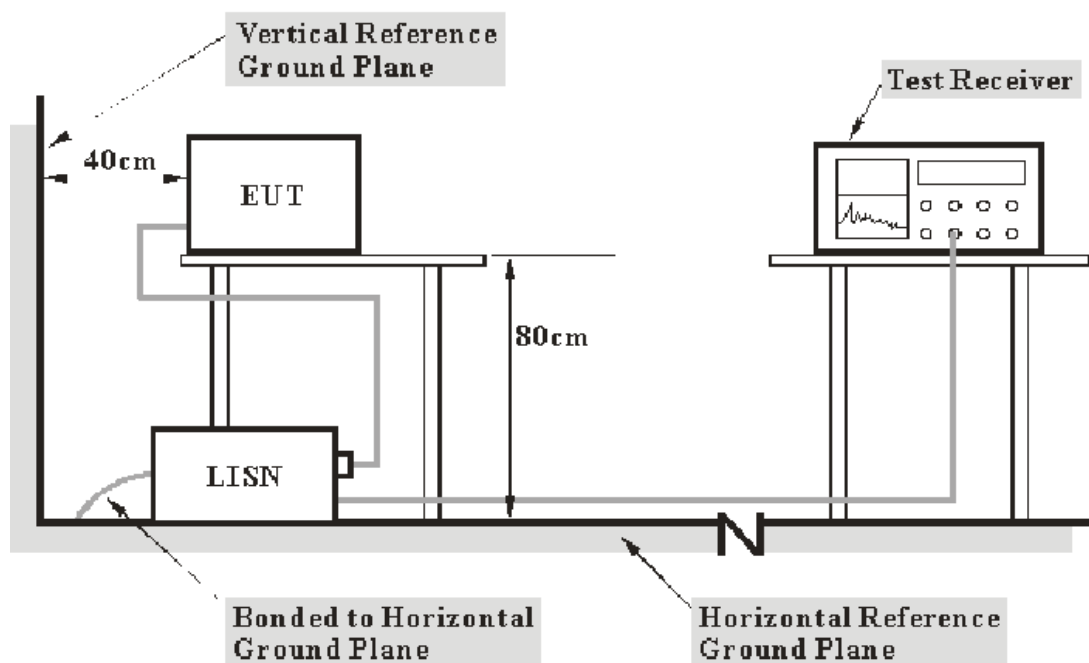
CONDUCTED EMISSION

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 ± 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:

<i>Frequency Range</i>	<i>IF B/W</i>
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	ESCI	100028	2005-8-17	2006-8-17
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:

-3.64 dB at 22.714 MHz in the Neutral conductor mode.

Test Data**Environmental Conditions**

Temperature:	22°C
Relative Humidity:	52%
ATM Pressure:	1005mbar

The testing was performed by Charmi Peng on 2002-2-24.

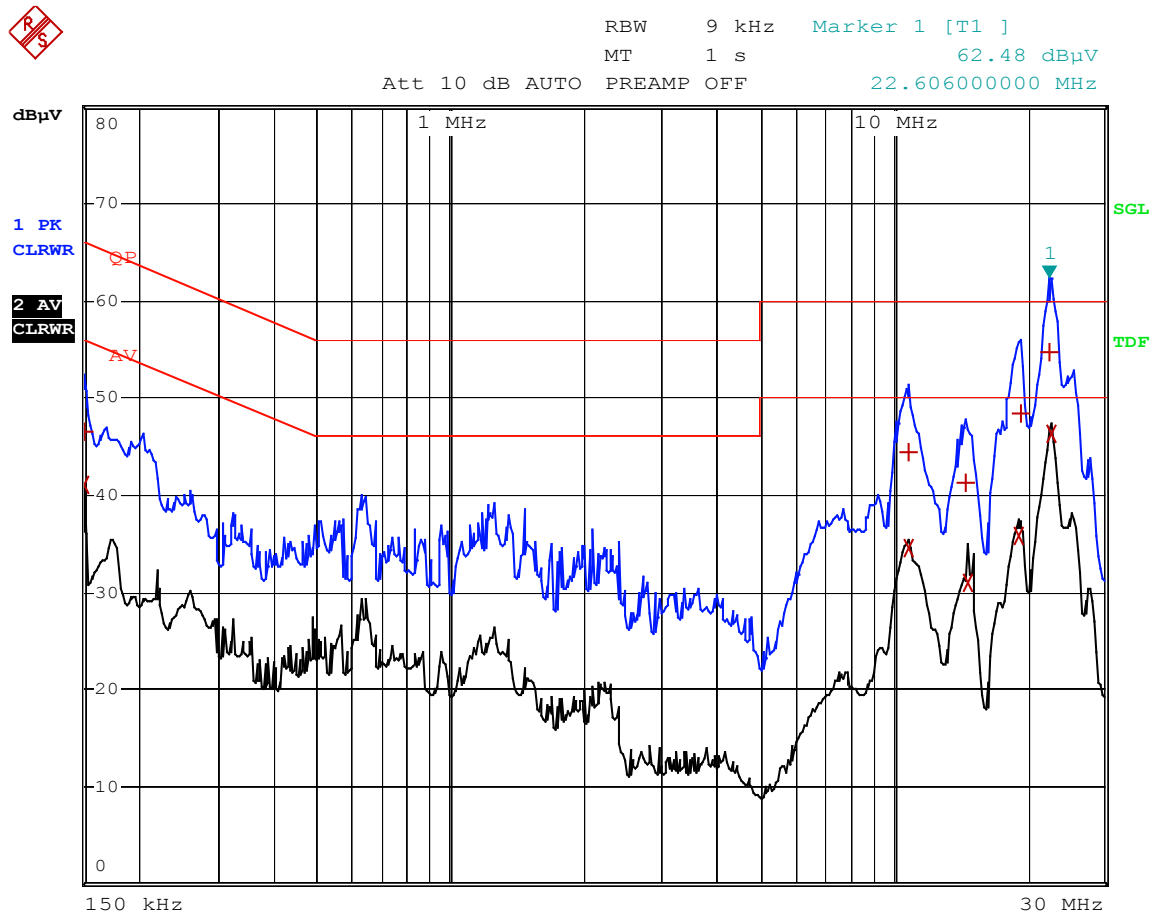
Test Mode: Max Power

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dBμV	Detector QP/AV	Phase Line/Neutral	Limit dBμV	Margin dB
22.714	46.36	AV	Neutral	50.00	-3.64
22.606	46.20	AV	Line	50.00	-3.80
22.714	55.34	QP	Neutral	60.00	-4.66
22.606	54.75	QP	Line	60.00	-5.25
19.306	48.50	QP	Neutral	60.00	-11.50
19.366	48.45	QP	Line	60.00	-11.55
19.306	36.08	AV	Neutral	50.00	-13.92
10.774	35.93	AV	Neutral	50.00	-14.07
19.366	35.78	AV	Line	50.00	-14.22
0.150	41.58	AV	Neutral	56.00	-14.42
10.774	45.53	QP	Neutral	60.00	-14.47
0.150	41.06	AV	Line	56.00	-14.94
14.746	44.68	QP	Neutral	60.00	-15.32
10.790	34.60	AV	Line	50.00	-15.40
10.790	44.51	QP	Line	60.00	-15.49
0.630	40.05	QP	Line	56.00	-15.95
14.746	33.73	AV	Neutral	50.00	-16.27
0.630	29.38	AV	Line	46.00	-16.62
0.150	48.18	QP	Neutral	66.00	-17.82
14.622	41.16	QP	Line	60.00	-18.84
14.622	30.87	AV	Line	50.00	-19.13
0.150	46.51	QP	Line	66.00	-19.49
1.274	26.12	AV	Neutral	46.00	-19.88
1.274	34.66	QP	Neutral	56.00	-21.34

Test Result: Pass

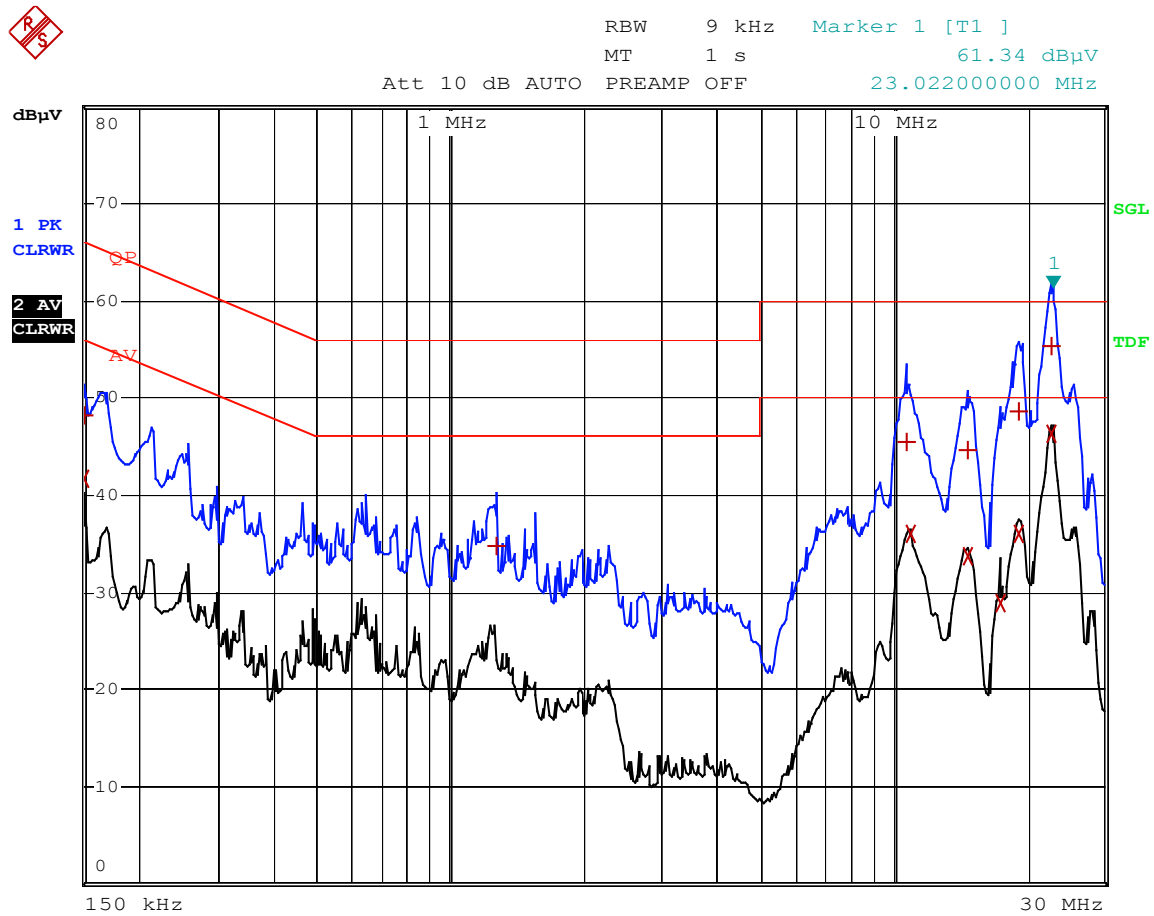
Plot(s) of Test Data

Plot(s) of test data is presented hereinafter as reference.



Whirlpool Microwave oven M/N:GH6208 Conducted L

Date: 24.FEB.2006 11:15:09



Whirlpool Microwave oven M/N:GH6208 Conducted N

Date: 24.FEB.2006 10:58:00

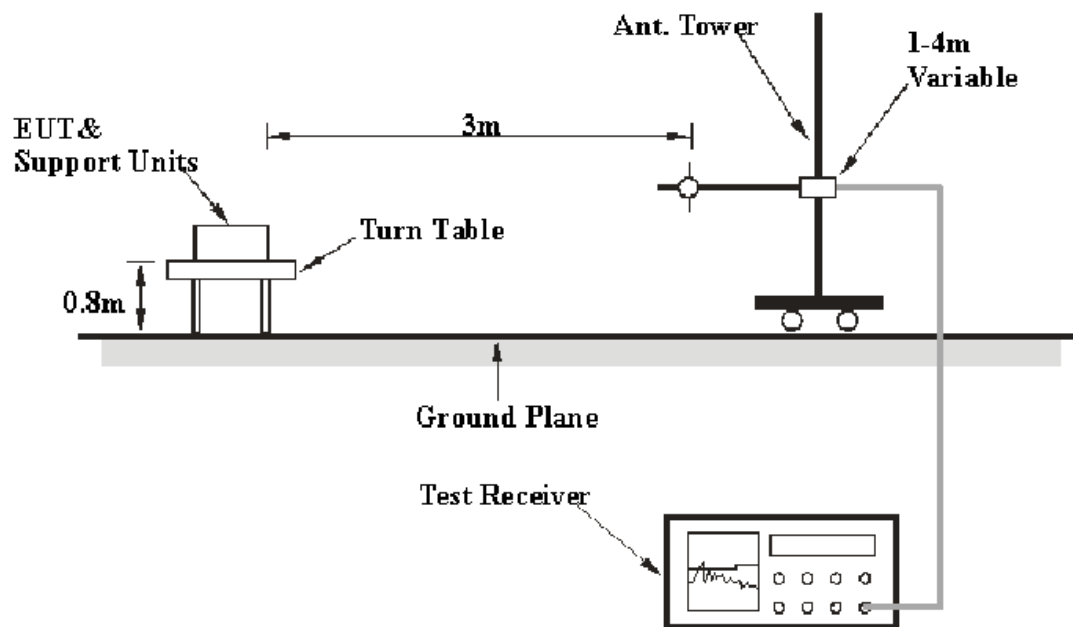
RADIATED EMISSION DATA

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 ± 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

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the spectrum analyzer 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 1000 MHz	1 MHz	10 Hz	

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2005-8-17	2006-8-17
HP	Amplifier	HP8447E	1937A01046	2005-8-17	2006-8-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2005-4-28	2006-4-28
Sunol Sciences	System Controller	SC99V	041304-1	N/A	N/A
HP	Amplifier	8449B	3008A00277	2005-8-17	2006-8-17
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2005-11-10	2006-11-10
Sunol Sciences	Horn Antenna	DRH-118	A052604	2005-7-20	2006-7-20

* **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 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:

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

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 maximum 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:

30MHz to 1000MHz: **-18.9 dB** at **64.53 MHz** in the **Vertical** polarization.

Above 1 GHz: **-13.00 dB** at **7326.25 MHz** in the **Horizontal** polarization.

Test Data and Plots**Environmental Conditions**

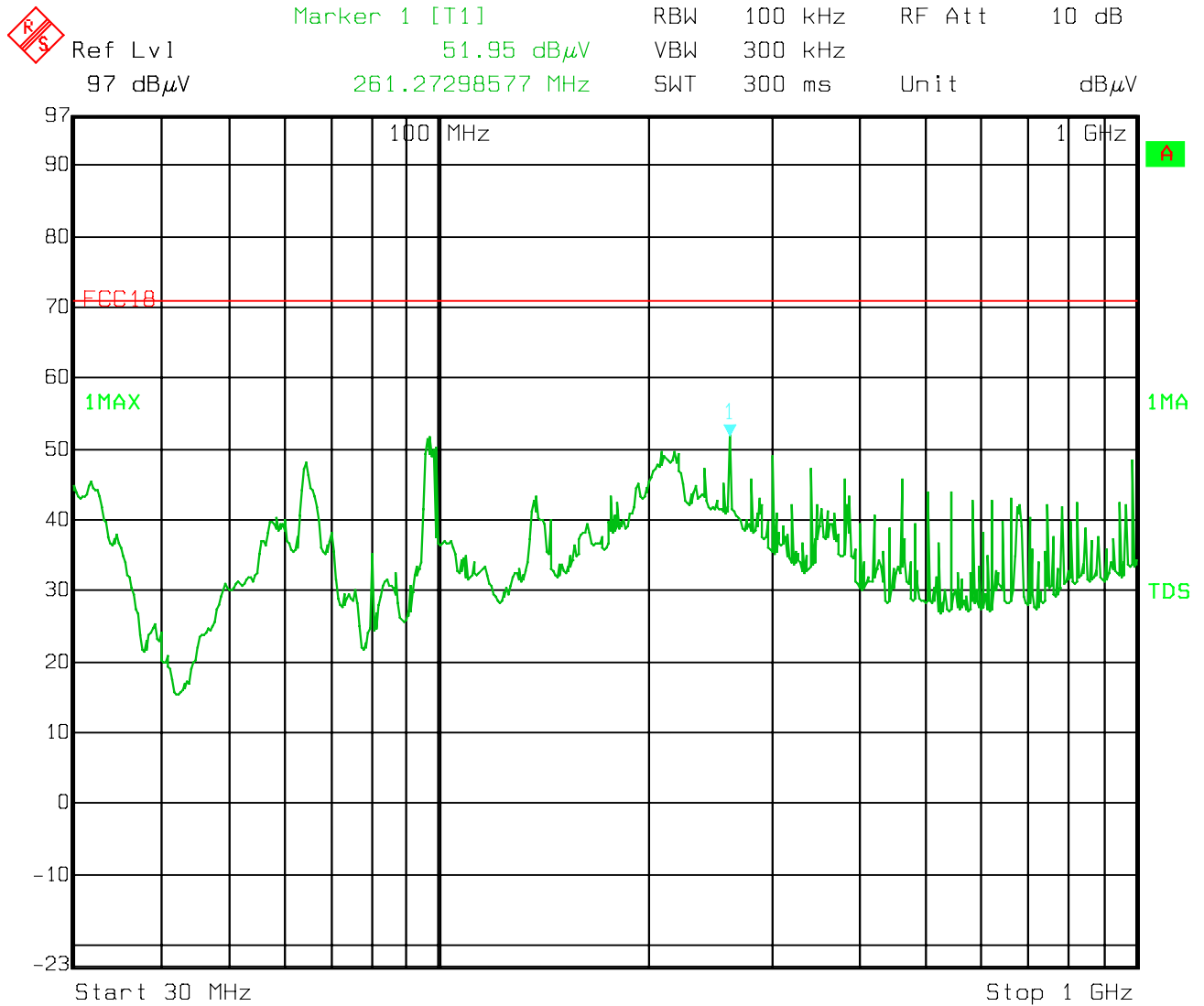
Temperature:	25° C
Relative Humidity:	55%
ATM Pressure:	1002mbar

Testing was performed by William Chan on 2005-12-30.

Test mode: MAX Power

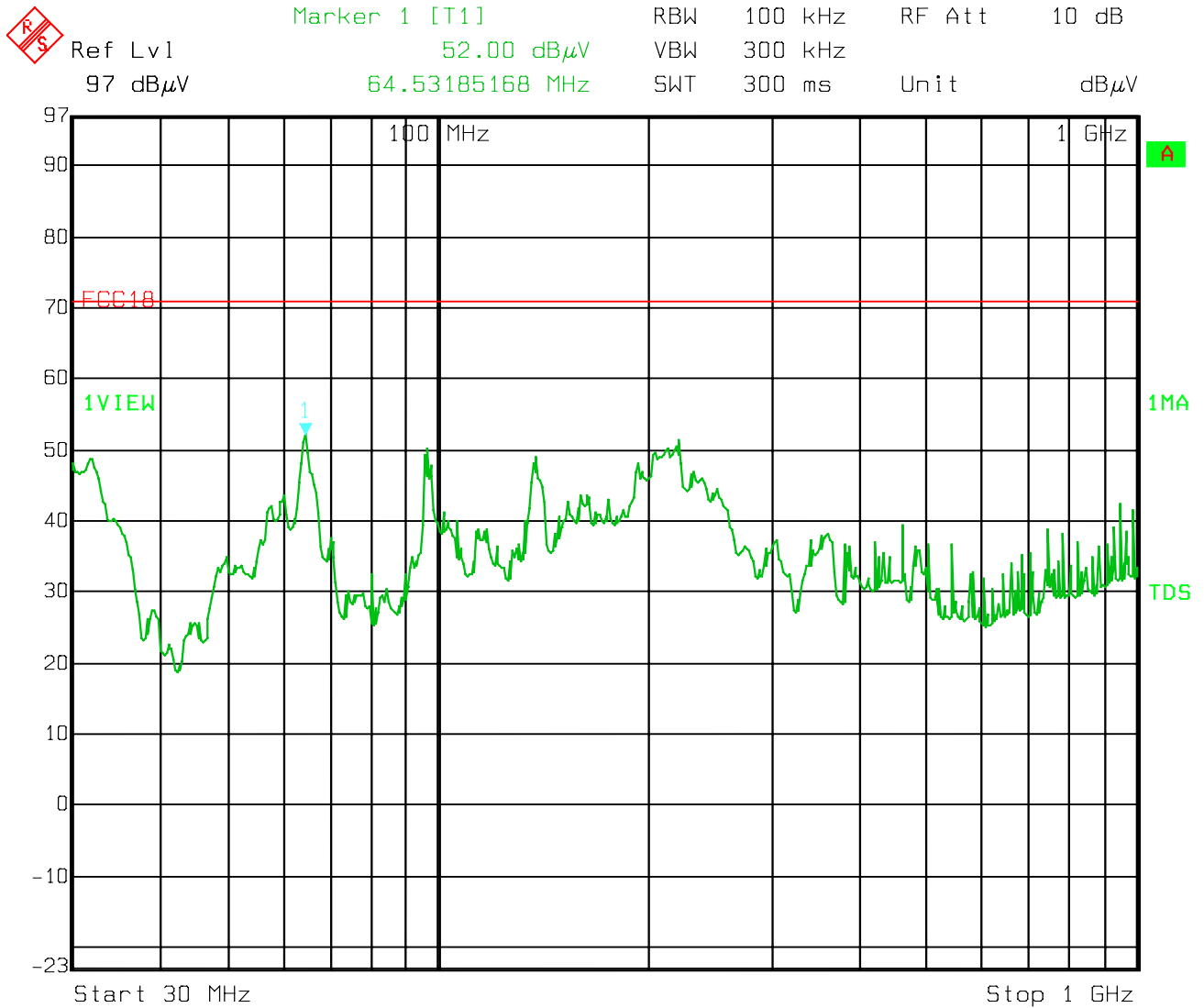
Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Corr.Ampl	FCC Part18	
MHz	dBuV/m	PK/AV	Degree	Meter	H / V	dB	dB	dB	dBuV/m	Limit dBuV/m	Margin dB
30 MHz to 1000 MHz											
64.53	51.10	PK	120	1.0	V	8.1	0.6	26.91	52.0	70.87	-18.9
261.27	48.30	PK	180	1.2	H	12.4	2.3	26.23	52.0	70.87	-18.9
97.00	50.50	PK	45	1.2	H	8.2	0.8	26.75	51.5	70.87	-19.3
220.72	51.30	PK	90	1.0	V	11.5	1.9	26.42	51.2	70.87	-19.7
213.10	52.80	PK	180	1.2	V	11.4	2.0	26.56	50.0	70.87	-20.9
96.32	51.80	PK	60	1.0	V	8.2	0.8	26.75	49.9	70.87	-21.0
208.65	52.20	PK	90	1.2	H	11.9	2.0	26.58	49.4	70.87	-21.5
137.83	51.60	PK	180	1.2	V	14.2	1.9	27.00	49.0	70.87	-21.9
300.69	52.12	PK	0	1.0	H	13.9	2.6	26.51	48.7	70.87	-22.2
31.95	48.10	PK	60	1.2	V	24.1	0.4	27.02	48.5	70.87	-22.3
64.53	50.31	PK	270	1.0	H	8.1	0.6	26.91	46.5	70.87	-24.4
31.95	47.65	PK	60	1.2	H	24.1	0.4	27.02	41.0	70.87	-29.9
1000 MHz to 25GHz											
7326.25	48.94	AV (Harmonic)	180	1.2	H	37.3	6.1	34.49	57.9	70.9	-13.00
7327.05	46.95	AV (Harmonic)	45	1.2	V	37.3	6.1	34.49	55.9	70.9	-15.00
9753.20	45.56	AV (Harmonic)	60	1.0	H	37.8	7.1	35.80	54.7	70.9	-16.20
4888.87	47.94	AV (Harmonic)	45	1.0	V	33.9	5.2	34.87	52.2	70.9	-18.70
9783.06	39.56	AV (Harmonic)	45	1.2	V	37.8	7.1	35.80	48.7	70.9	-22.20
4896.09	40.56	AV (Harmonic)	60	1.0	H	33.9	5.2	34.87	44.8	70.9	-26.10
2447.34	89.16	PK (Fundamental)	45	1.0	V	28.1	3.7	0	121.0		
2445.82	90.03	PK (Fundamental)	180	1.2	H	28.1	3.7	0	121.8		

Horizontal:



Title: GH6208-H
Date: 30.DEC.2005 20:17:55

Vertical:



Title: GH6208-V
Date: 30.DEC.2005 20:22:23