

FCC PART 18
EMI MEASUREMENT AND TEST REPORT
For
Whirlpool Microwave Products Development Limited.

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Causeway Bay, Hong Kong

FCC ID: PR4MH3185Y

Report Type: Class II Permissive Change Report	Product Type: Microwave Oven
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* This report may contain 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: YKHMS1850 or the "EUT" as referred to in this report is a Microwave Oven which measures approximately 76.0cm L x 42.0cm W x 44.0cm H, rated input voltage: AC 120 V/60 Hz.

* All measurement and test data in this report was gathered from production sample serial number: 0809507 (Assigned by BACL, Shenzhen). The EUT was received on 2008-09-03.

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:

	Original	New
HV Capacitor	1.05 μ F	0.95 μ F

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

Related Submittal(s)/Grant(s)

This is a C2PC application. The original application was granted on 2004-06-03.

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 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 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).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
<http://ts.nist.gov/Standards/scopes/2007070.htm>

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.

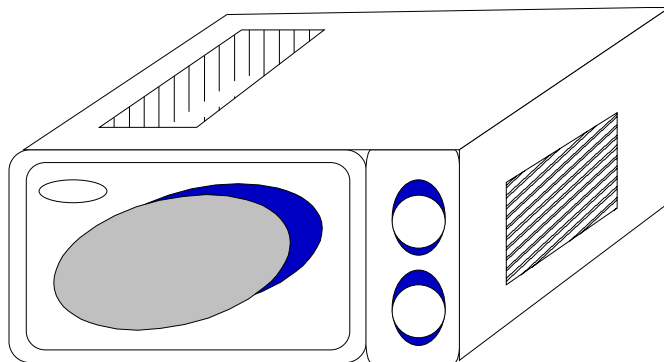
Equipment Modifications

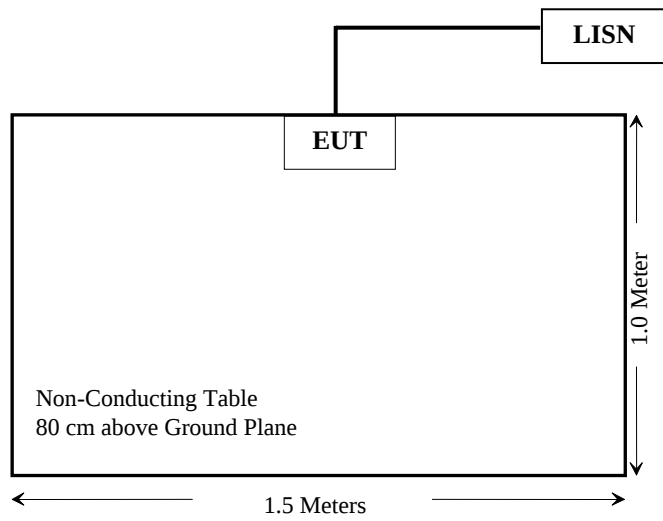
No modifications were made to the unit tested.

External Cable List and Details

Cable Description	Length (m)	From/Port	To
Unshield Detachable Power Cable	1.05	EUT	LISN

Configuration of Test Setup



Block Diagram of Test Setup

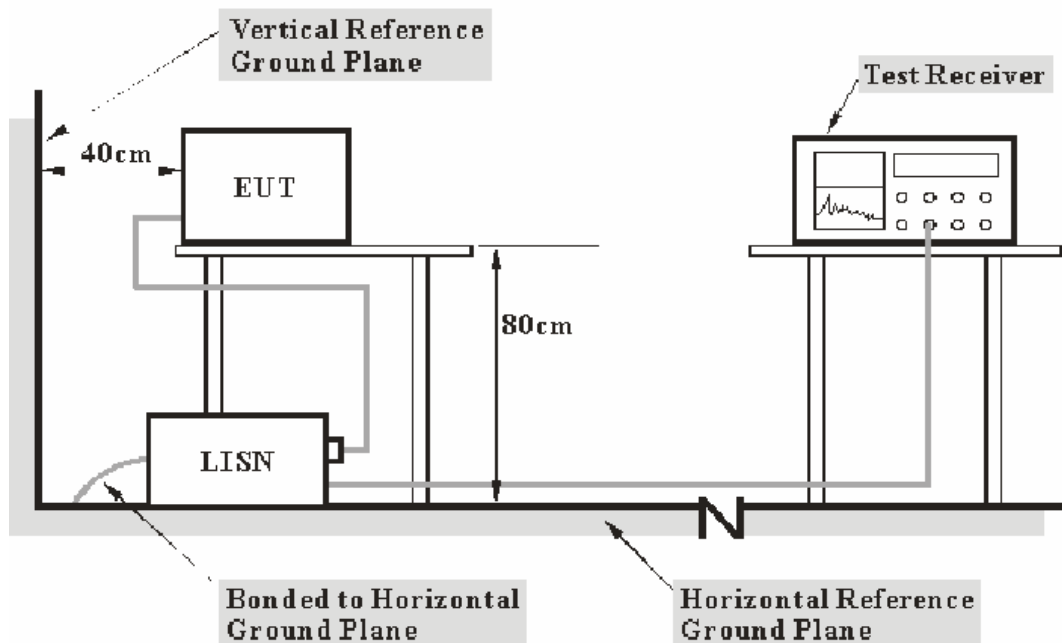
CONDUCTED EMISSIONS

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.

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:

<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	2008-03-25	2009-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2008-03-25	2009-03-25

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

* **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, with the worst margin reading of:

6.60 dB at 15.4400 MHz in the **Neutral** conductor mode.

Test Data**Environmental Conditions**

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

The testing was performed by Chris Peng on 2008-09-08.

Test Mode: Max Power

Line Conducted Emissions				FCC Part 18	
Frequency (MHz)	Amplitude (dBμV)	Detector (QP/AV)	Phase (Line/Neutral)	Limit (dBμV)	Margin (dB)
15.4400	43.40	AV	Neutral	50.00	6.60
13.9050	49.40	QP	Line	60.00	10.60
15.4400	48.40	QP	Neutral	60.00	11.60
10.6200	47.20	QP	Neutral	60.00	12.80
8.7800	46.60	QP	Line	60.00	13.40
0.4400	38.40	QP	Line	57.06	18.66
0.9850	35.30	QP	Line	56.00	20.70
0.6150	31.90	QP	Neutral	56.00	24.10
2.3900	31.80	QP	Neutral	56.00	24.20
2.3900	30.90	QP	Line	56.00	25.10
0.1650	38.30	QP	Line	65.21	26.91
0.6150	18.90	AV	Neutral	46.00	27.10
0.2500	33.70	QP	Neutral	61.76	28.06
2.3900	17.60	AV	Neutral	46.00	28.40
2.3900	17.50	AV	Line	46.00	28.50
0.9850	16.90	AV	Line	46.00	29.10
13.9050	19.90	AV	Line	50.00	30.10
0.1550	35.50	QP	Neutral	65.73	30.23
10.6200	17.20	AV	Neutral	50.00	32.80
0.4400	13.60	AV	Line	47.06	33.46
8.7800	12.20	AV	Line	50.00	37.80
0.2500	13.70	AV	Neutral	51.76	38.06
0.1650	10.20	AV	Line	55.21	45.01
0.1550	10.50	AV	Neutral	55.73	45.23

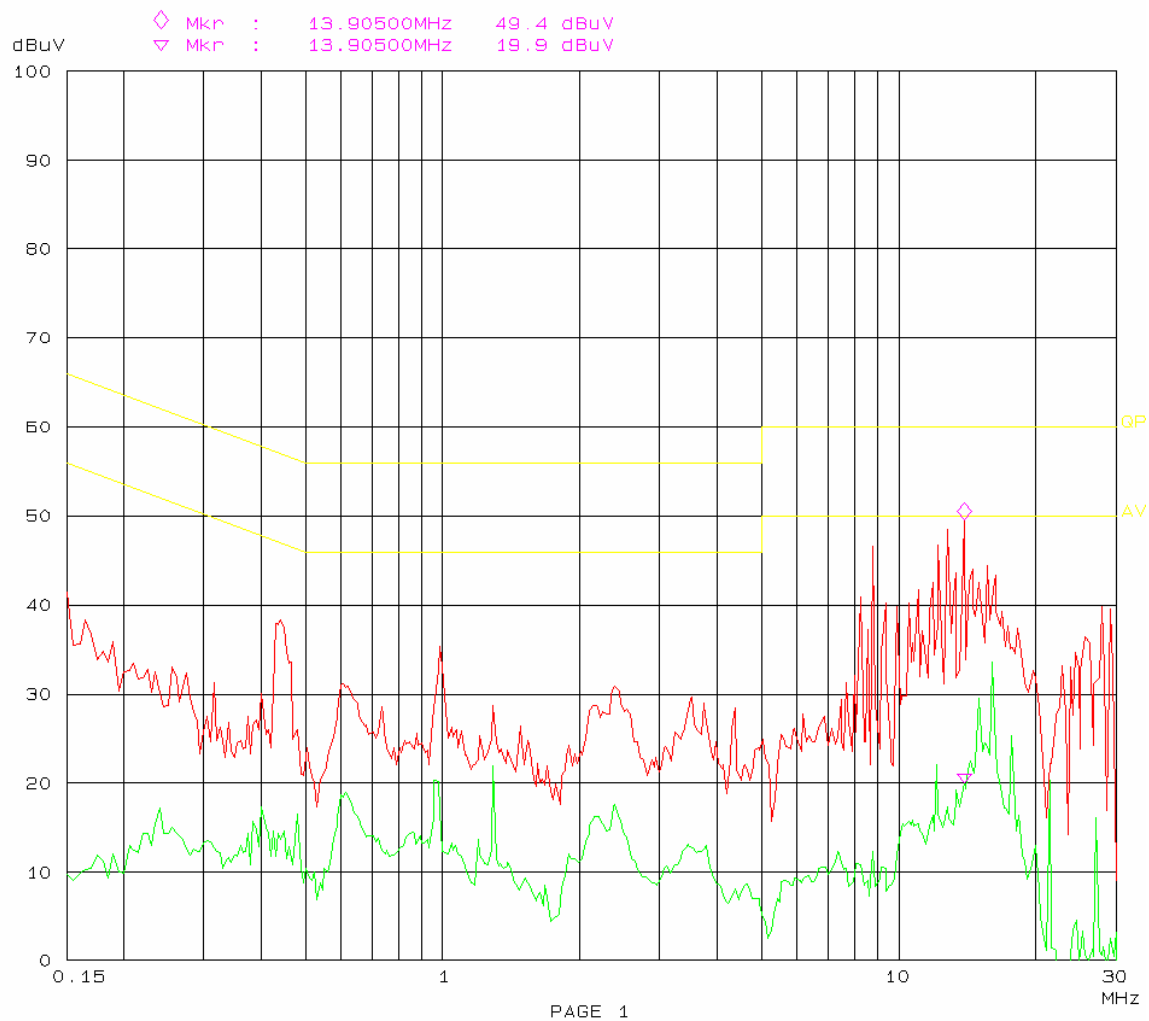
Plot(s) of Test Data

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

Conducted Emission
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08. Sep 08 19:52

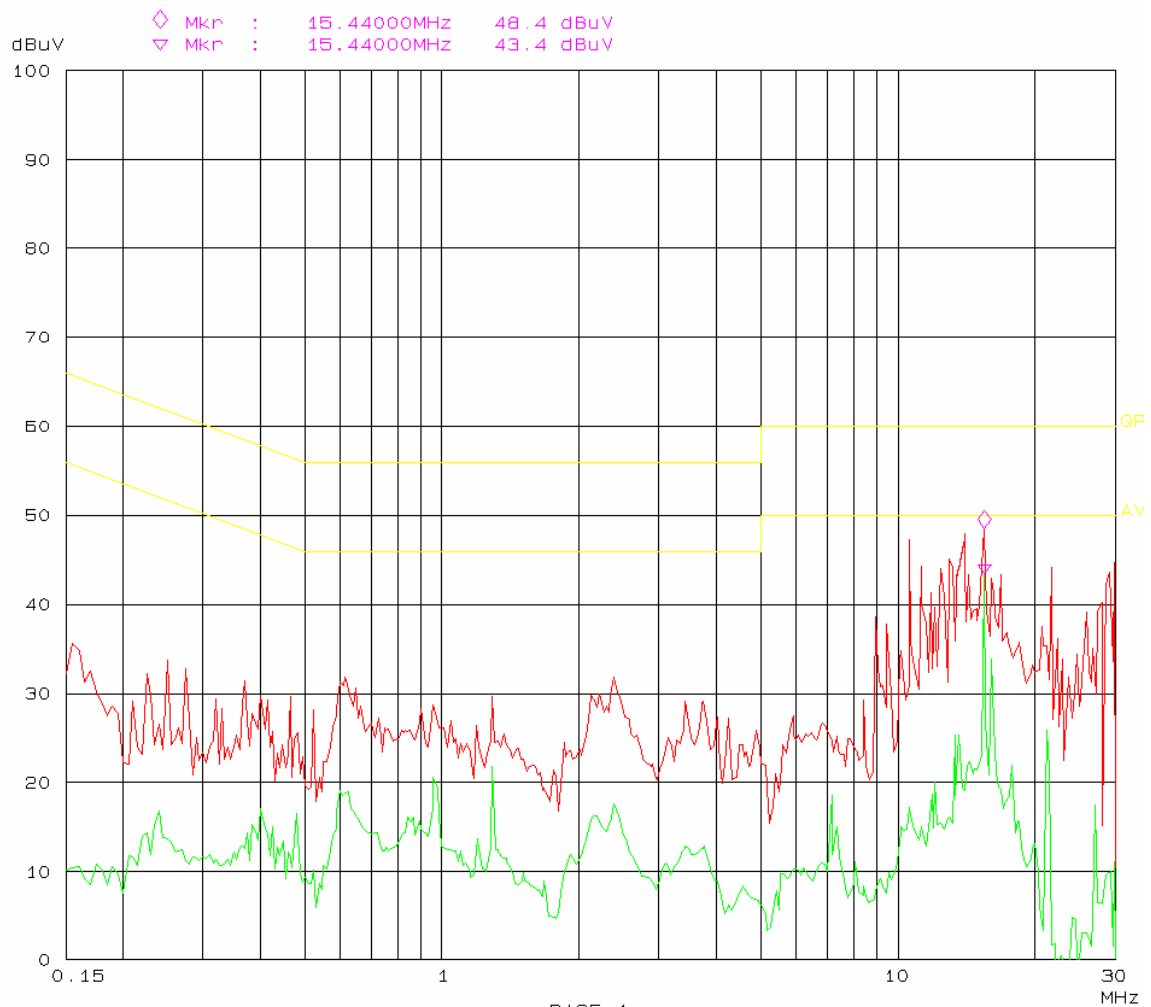
EUT: Microwave Oven M/N: YKHMS1850
Manuf: Whirlpool
Op Cond: Max Power
Operator: Chris
Test Spec: AC120V/60Hz Line
Comment: Temp: 25 Hum: 56%



Conducted Emission
FCC PART 18

08. Sep 08 19:30

EUT: Microwave Oven M/N: YKHMS1850
Manuf: Whirlpool
Op Cond: Max Power
Operator: Chris
Test Spec: AC120V/60Hz Neutral
Comment: Temp: 25 Hum: 56%



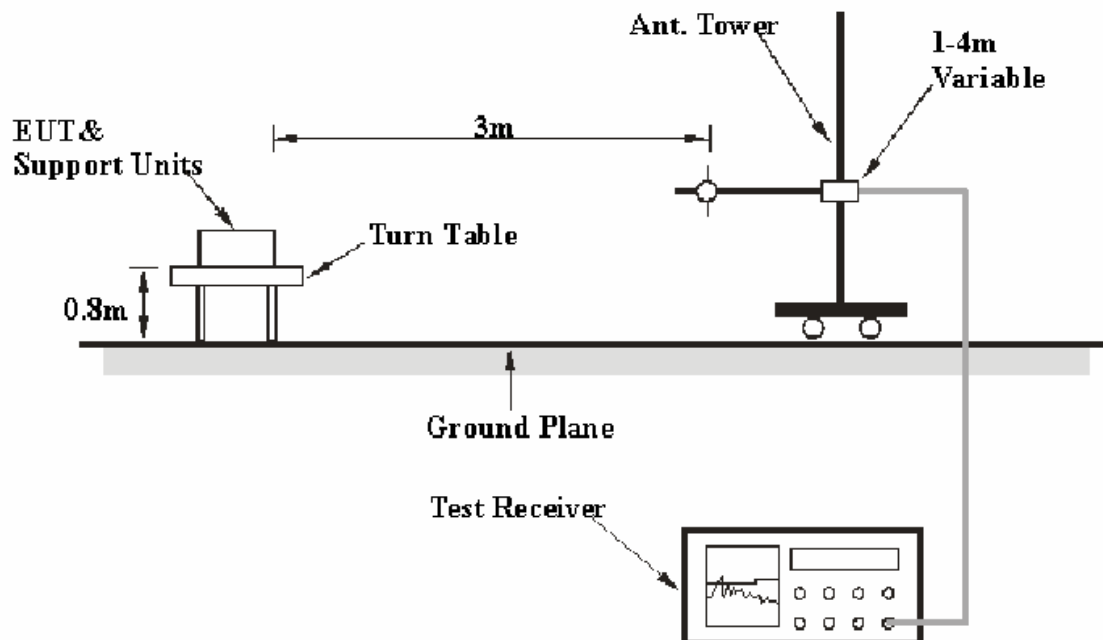
RADIATED EMISSIONS

Measurement Uncertainty

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

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 and Spectrum Analyzer were 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	HP8447D	2944A09795	2007-11-15	2008-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2007-10-16	2008-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-03-11	2009-03-11
Sunol Sciences	System Controller	SC99V	041304-1	N/A	N/A
A.H. System	Horn Antenna	SAS-200/571	135	2008-05-17	2009-05-17
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

*** 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 and average detection mode above 1GHz.

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:

2.8 dB at 40.306250 MHz in the **Vertical** polarization, 30MHz - 1GHz

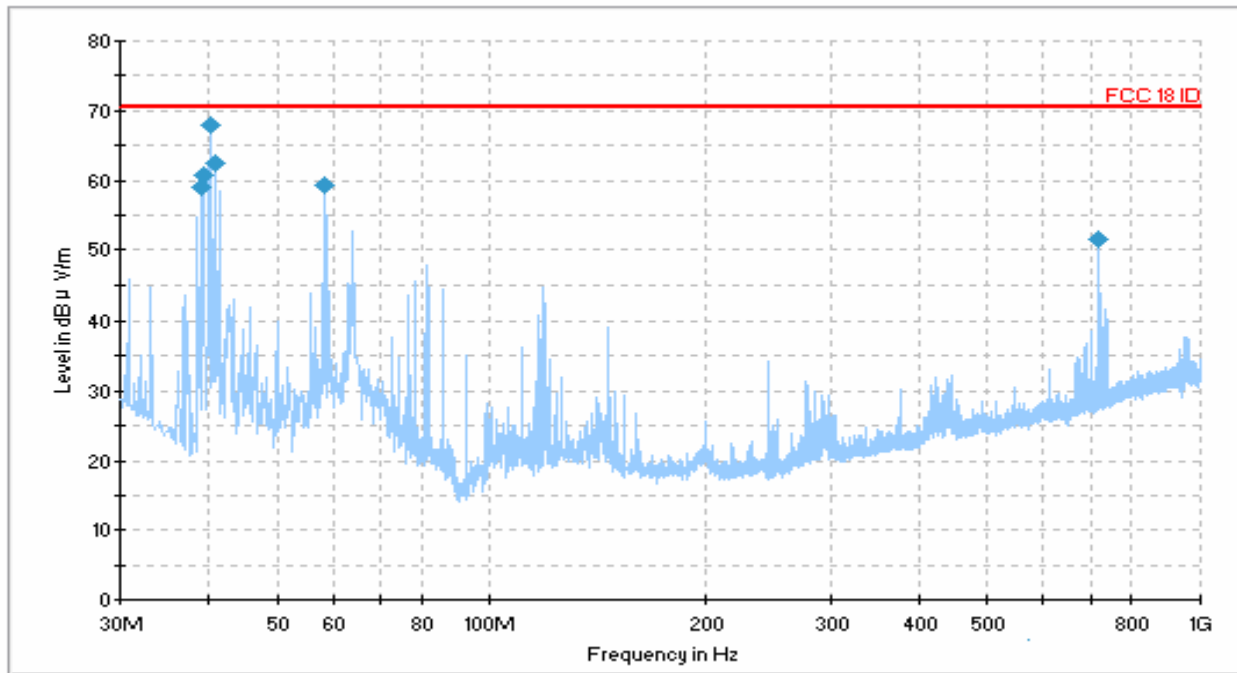
Test Data and Plots

Environmental Conditions

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

The testing was performed by Chris Peng on 2008-09-07.

Test Mode: Max Power



Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dB μ V/m)	Margin (dB)
40.306250	67.6	154.0	V	155.0	-10.6	70.4	2.8*
39.336250	60.8	111.0	V	165.0	-8.1	70.4	9.6
38.972500	58.8	147.0	V	164.0	-4.9	70.4	11.6
41.033750	62.4	117.0	V	181.0	-2.0	70.4	8.0
58.130000	59.1	144.0	V	181.0	-0.1	70.4	11.3
717.366250	50.3	182.0	V	188.0	1.9	70.4	20.1

Note: * Within measurement uncertainty.

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