China

EMISSION - TEST REPORT

Report Number	:	**64.710.07.324.01 – (E)**	Date of Issue:	22 October 2007

Model / Serial No.	:	**TSK-M2815SEHS / NIL**
Product Type	:	**Microwave oven**
Applicant	:	**Tsann Kuen Enterprise Co., Ltd.**
Manufacturer	:	**Tsann Kuen (Zhangzhou) Enterprise Co., Ltd.**
License holder	:	**Tsann Kuen Enterprise Co., Ltd.**
Address	:	**3 Kai Fa 2nd Rd, Pao An Industrial District, Ren Teh. Hsiang,**
	:	**Tainan, Taiwan**
Test Result	:	■ **Positive** □ **Negative**
Total pages including Appendices	:	18

The test result only responds to the tested sample.

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D I R E C T O R Y

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TEST REGULATIONS :

The tests were performed according to the following regulations:

■ - 47 CFR Part 18

Test Facilities

■ - Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory.

Add: Bldg, of Shenzhen Metrology & Quality Inspection Institute, Longzhu Road,
Nanshan, Shenzhen 518055 P.R.C.

Environmental Conditions

Temperature:	: 25 ℃
Relative Humidity:	: 66 %
Atmospheric Pressure:	: 1006 mBar

Power Supply System Utilized:

Power supply system : 120V/60Hz/1ø

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities that can account for a nominal measurement error. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Short Description of the Equipment under Test(EUT)

TSK-M2815SEHS is a microwave oven operates in the frequency 2.450GHz.

Communication type:	TSK-M2815SEHS
Power Consumption:	120V~60Hz, 1500W (microwave)
Output power:	900W
Operation Frequency:	2450MHz
Magnetron Manufacturer:	Witol
Magnetron Model Number:	2M219H920
Power Cable:	75cm

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Definitions For Symbols Used In This Test Report

■ - Black box indicates that the listed condition, standard or equipment is applicable for this report
☐ - Blank box indicates that the listed condition, standard or equipment was not applicable for this report.

Status of Facility Used for Testing

Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory located at Bldg, of Shenzhen Metrology & Quality Inspection Institute, Longzhu Road, Nanshan, Shenzhen, Guangdong,China is listed in the US Federal Communications Commission list of facilities approved to perform measurements.

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 1000 watts output, each quantity was increased by 50% for each 500 watts or fraction thereof in excess of 1000 watts. Additional beakers were used if necessary.

- Load for power Input and 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 radiation hazard 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.
- Load for other measurement: 700 milliliters of water in the beaker located in the center of the oven.

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Test Equipment Used:

Serial No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
93926	Microwave leakage meter	Holaday	-----	27 Apr. 2007	1 Year
508015	power meter	EVERFINE	PF9808B	04 Jun.2007	1 Year
SB2552	Digital thermometer	Anritsu	HFT-90V/90	14 Mar. 2007	1 year
100003	EMI Test Receiver	Rohde & Schwarz	ESCS30	30 Jan. 2007	1 Year
100002	AMN	Rohde & Schwarz	ESH2-Z5	30 Jan. 2007	1 Year
838786/013	EMI Test Receiver	Rohde & Schwarz	ESI26	30 Jan. 2007	1 Year
2591	Bilog Antenna	Chase	CBL6112B	Jan.26, 2007	1 Year
100014	Horn Antenna	Rohde & Schwarz	HF906	Jan.26, 2007	1 Year
100013	Horn Antenna	Rohde & Schwarz	HF906	Jan.26, 2007	1 Year
SB3435/01	Amplifier(1-18GHz)	Rohde & Schwarz	---	Jan.26, 2007	1 Year
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Jan 26,2007	1 Year

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RADIATION HAZARD MEASUREMENT

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

The EUT was set up according to the FCC MP-5 and FCC Part 18 for Radiation Hazard Measurement. The measurement was using a microwave leakage meter to measure the Radiation leakage in the as-received condition with the oven door closed.
A 1000ml water load was placed in the center of the oven and the oven was operated at maximum output power.

TEST Result:

There was no microwave leakage exceeding a power level of 0.32mW/cm^2 observed at any point 5cm or more from the external surface of the oven.

A maximum of 1.0 mW/cm^2 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.

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INPUT POWER MEASUREMENT

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

The EUT was set up according to the FCC MP-5 and FCC Part 18 for Input power measurement.
Input power and current was measured using a power analyzer.
A 1000ml water load was placed in the center of the oven and 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.

TEST Result:

Input Voltage (Vac/Hz)	Input Current (amps)	Measured Input Power (watts)	Rated Input Power (watts)
120/60	11.8	1340	1500

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RF OUTPUT POWER MEASUREMENT

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

The EUT was set up according to the FCC MP-5 and FCC Part 18C for RF output power Measurement. The Caloric Method was used to determine maximum RF output power.
The initial temperature of the water load was measured. A 1000ml water load in a beaker was located in the center of the oven. The oven was operated at maximum output power for 120 seconds, the temperature of the water was re-measured.

RF Output Power

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

= 4.2joules/calorie × 1000 × (Final Temp – Initial Temp) / 120

TEST Result:

Quality of Water (ml)	Starting Temperature (℃)	Final Temperature (℃)	Elapsed Time (Seconds)	RF Output Power (watts)
1000	26.7	43.4	120	584.5

☐ 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 25uV/meter at a 300-meters measurement distance

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

LFS = 25 × SQRT (power output / 500)
= 25 × SQRT (584.5 /500)
≈ 27.03

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

Model Number	LFS	dB(uV/M)	dB(uV/M)@3m
TSK-M2815SEHS	27.03	28.6	68.6

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OPERATING FREQUENCY MEASUREMENT

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

The EUT was set up according to the FCC MP-5 and FCC Part 18 for Operating frequency measurement.

1) 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.

2) Variation in Operating Frequency with Line Voltage

The EUT was operated/ warmed by at least 10minutes 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.

TEST Result:

Variation in Operating Frequency with Time:

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2452.1	2454.1

Variation in Operating Frequency with Line Voltage:

Minimum Frequency (MHz)	Maximum Frequency (MHz)
2448.9	2457.3
Note: Line voltage varied from 96Vac to 150Vac	

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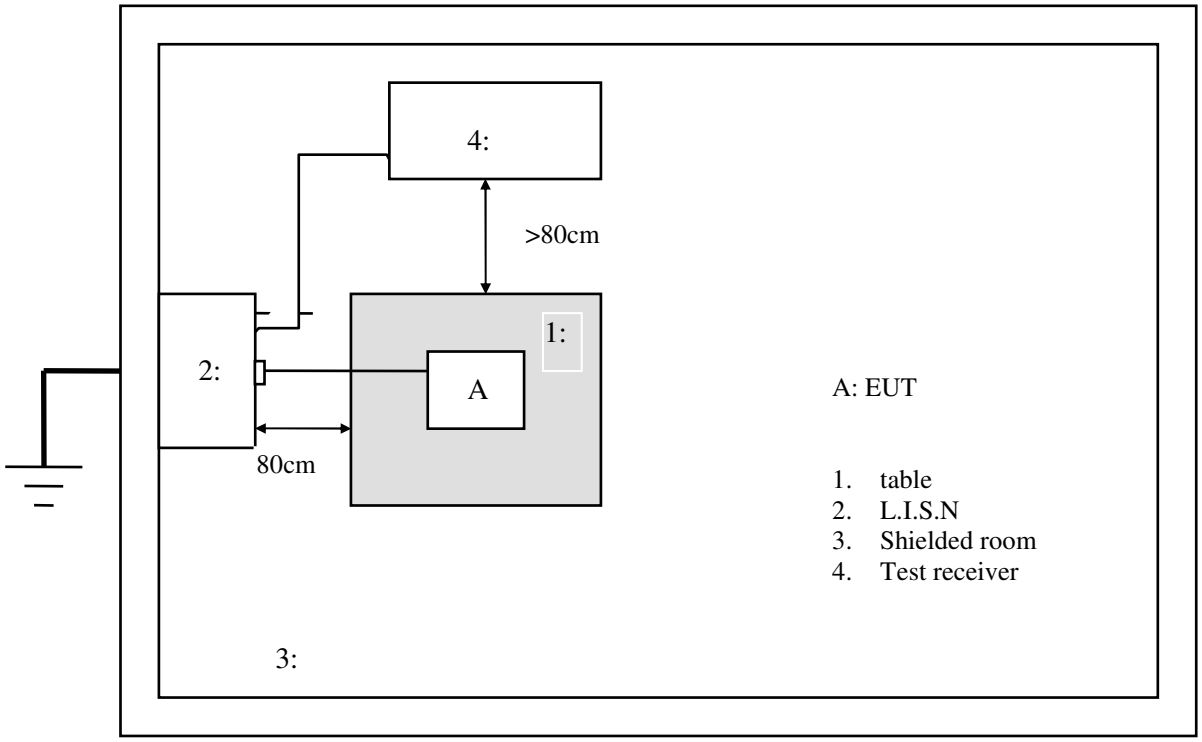
CONDUCTED EMISSION

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

The EUT was set up according to the guideline of ANSI C63.4: 2003 & FCC MP-5 for conducted emissions.
The EMI test receiver was set to investigate the spectrum from 150KHz to 30MHz.
During the conducted emission test, IF B/W of the EMI test receiver was set to 9KHz.
During the conducted emission test, the EUT power cord was connected to the outlet 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 Setups:



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TEST Result:

Line	Frequency (MHz)	Corrected QP Reading (dBuV)	Limit (dBuV)	Corrected AV Reading (dBuV)	Limit (dBuV)
L	0.218	43.3	62.8	18.3	52.8
L	0.494	43.5	56.1	17.6	46.1
L	0.624	44.2	56	17.0	46
L	0.804	32.2	56	11.0	46
L	2.44	30.0	56	9.2	46
L	13.65	31.2	60	10.6	50
N	0.354	42.2	58.8	15.3	48.8
N	0.37	41.8	58.5	15.4	48.5
N	0.474	33.3	56.4	9.6	46.4
N	1.46	28.4	56	7.6	46
N	2.49	34.6	56	12.6	46
N	13.685	27.0	60	10.0	50

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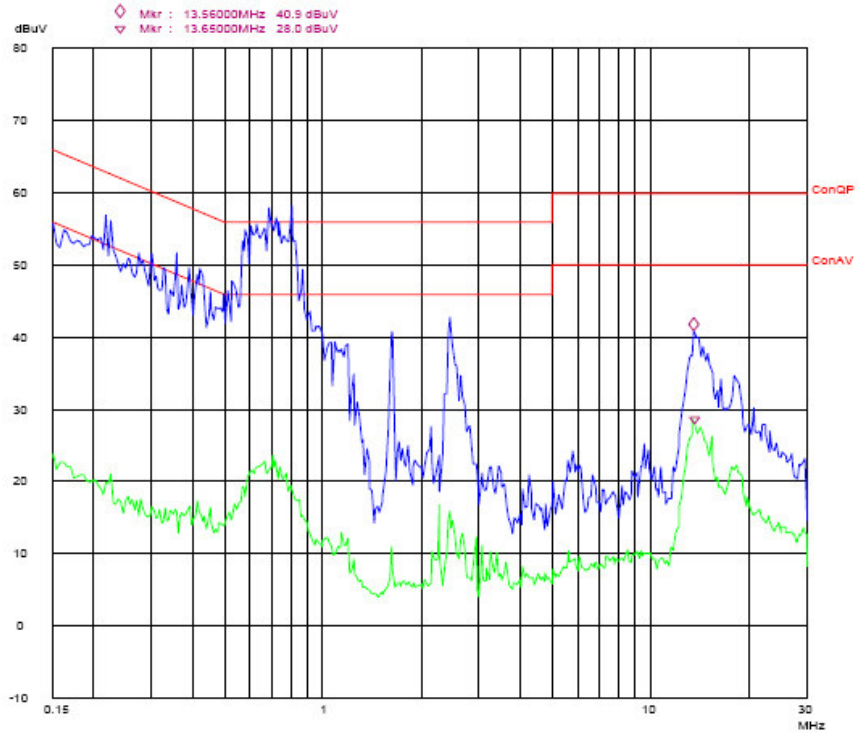
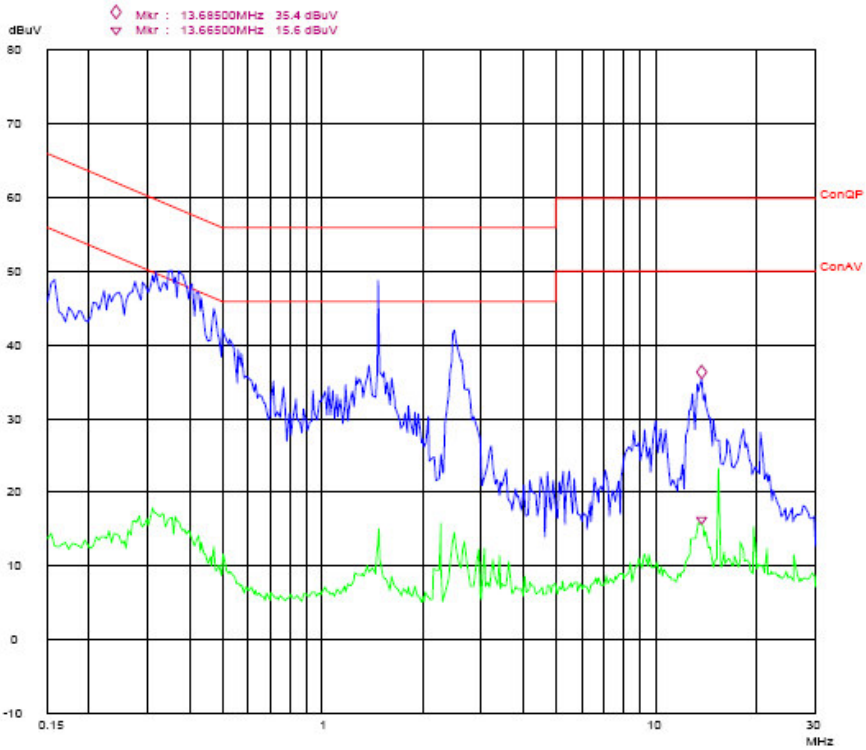


Line L Conducted Emission Graph



Line N Conducted Emission Graph

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RADIATED EMISSION

TEST REFERENCE: ANSI C63.4:2003, FCC/OST MP-5:1986

TEST PROCEDURE

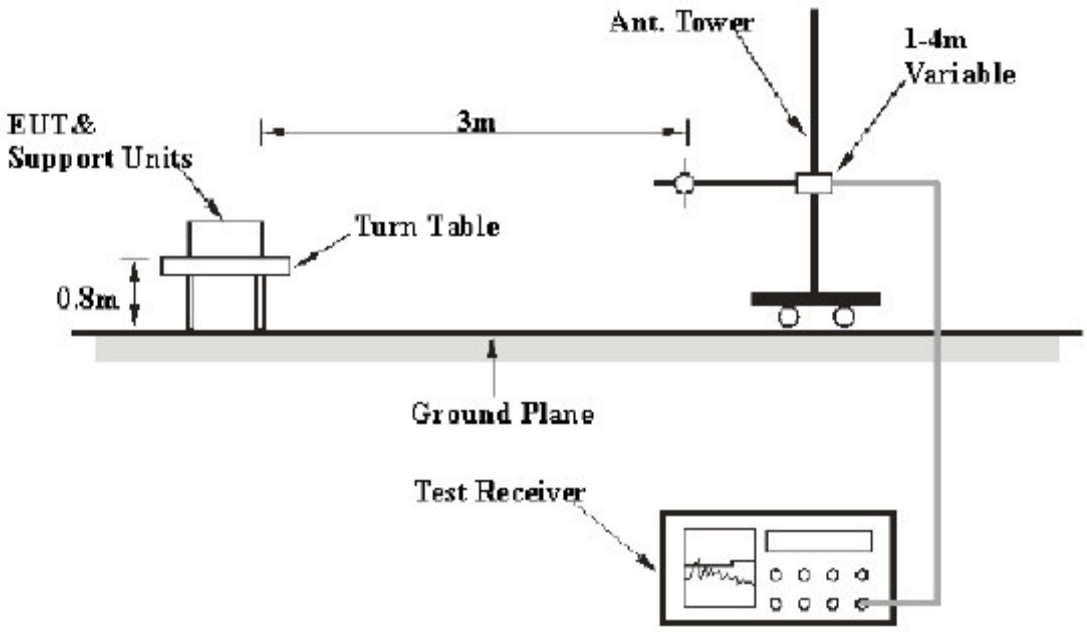
The EUT was set up according to the guideline of ANSI C63.4: 2003 & FCC MP-5 for radiated emissions.
The radiated emission tests were performed in the 3 meters chamber A test site.
The EUT was connected to 120VAC/60Hz power source.
The system was investigated from 30MHz to 24.5GHz
During the radiated 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	300 kHz	120 kHz
Above 1 GHz	1 MHz	30Hz	

Start Frequency	1 GHz
Stop Frequency	24.5 GHz
Sweep Speed	Auto
Video Bandwidth	30 Hz
Resolution Bandwidth	1 MHz

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 operating mode during the final qualification test to represent the worst results.
All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz and average detection mode above 1GHz.

TEST Setups:



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Corrected Amplitude

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

TEST Result:

Frequency (MHz)	Antenna Polarization	Corrected Reading, QP (dBuV.m)	3 Meters Limit (dBuV/m)
30MHz – 1GHz			
35.635	H	35.73	68.6
246.611	H	26.81	68.6
331.891	H	32.32	68.6
492.943	H	40.75	68.6
620.831	H	25.34	68.6
738.324	H	36.41	68.6
35.414	V	48.57	68.6
272.030	V	30.17	68.6
495.943	V	31.47	68.6
583.496	V	33.71	68.6
599.070	V	41.06	68.6
687.371	V	38.45	68.6
Frequency (MHz)	**Antenna Polarization**	**Corrected Reading, AV (dBuV.m)**	**3 Meters Limit (dBuV/m)**
1GHz – 25GHz			
2208.615	H	34.56	68.6
2717.921	H	39.87	68.6
4194.729	H	38.59	68.6
7411.823	H	38.48	68.6
8500.661	H	41.32	68.6
10510.530	H	42.31	68.6
14844.757	H	46.66	68.6
17594.210	H	49.13	68.6
2188.937	V	39.21	68.6
2728.212	V	42.46	68.6
4194.328	V	41.74	68.6
7104.248	V	43.93	68.6
7411.823	V	41.89	68.6
8505.310	V	44.97	68.6
10144.440	V	49.64	68.6
14836.847	V	56.51	68.6

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Equipment Under Test

The equipment under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test Program (H - Pattern)

☐ - Test Program (Color Bar)

☐ - Test Program (Customer Specified)

■ - Normal use

☐ - _____

_____

The following peripheral devices and interface cables were connected during the testing:

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

■ - unshielded power cable (75cm)

☐ - unshielded cables

☐ - shielded cables TUVPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

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GENERAL REMARKS:

FIANL JUDGEMENT:

The requirements according to the technical regulations and tested operation modes are

■ - Met

☐ - **Not** Met

The Equipment Under Test

■ - **Fulfills** the general approval requirements cited on page 3.

☐ - **Does not** fulfill the general approval requirements cited on page 3.

Testing Start Date: 29 August 2007

Testing End Date: 30 August 2007

- TÜV PRODUCT SERVICE ASIA LTD. -

Reviewed by: Prepared by:

Kitty Xu Tony Liu

TÜV SÜD Group China Guangzhou Branch

26/F, Dongbao Tower, #767 Dongfeng Road East. (510600) Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

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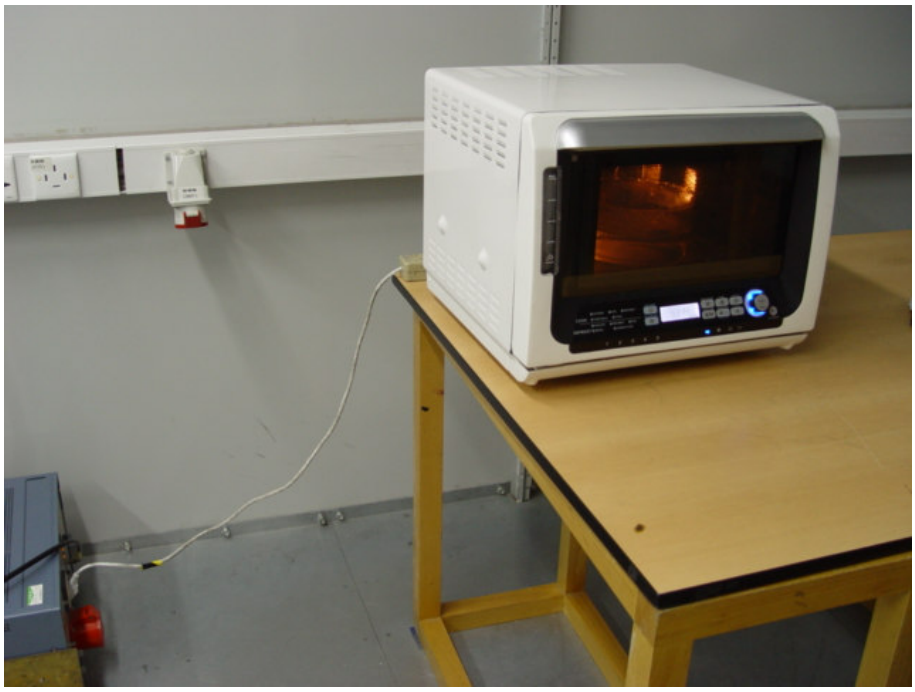
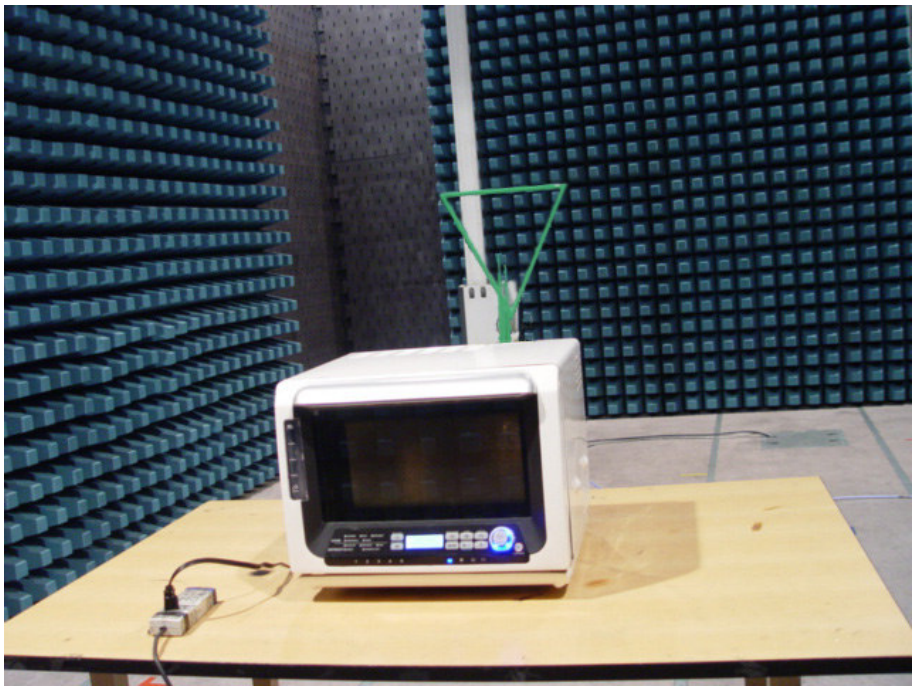
Photographs of the Test Set-Up

Set-up for radiation measurement below 1GHz





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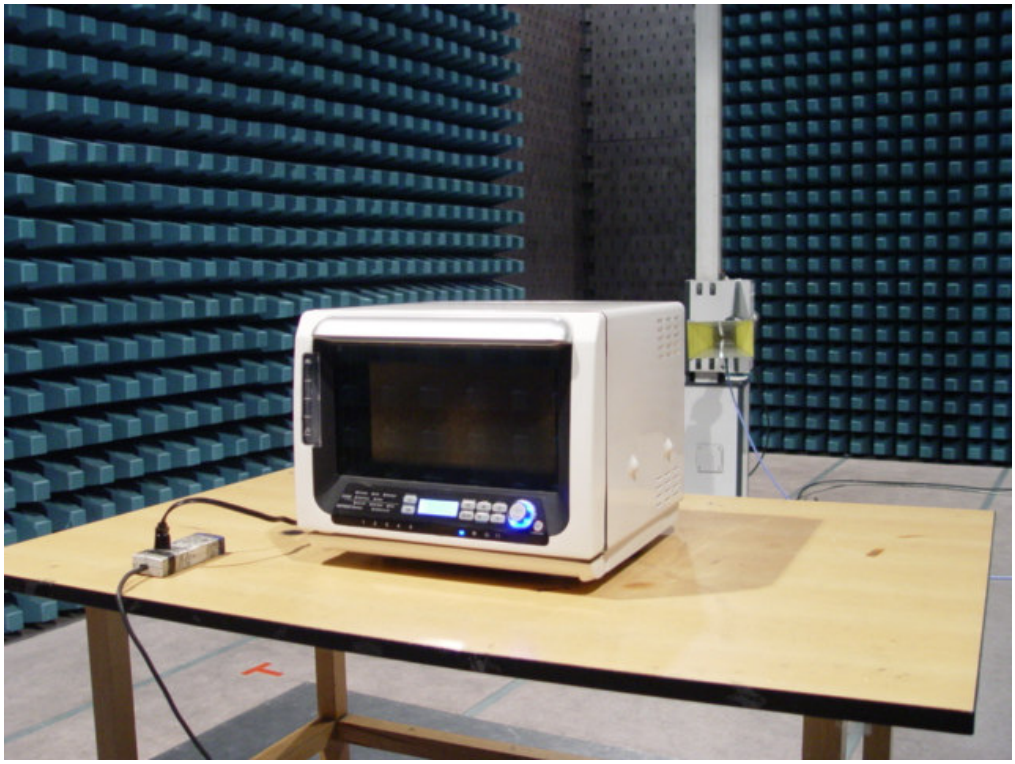
Set-up for radiation measurement above 1GHz



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