



FCC Part 18

TEST REPORT

For

Microwave oven

MODEL NUMBER: RED(X)0(Y)H-(Z)

REPORT NUMBER: 4789036512.1

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Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/27/2019	Initial Issue	--



Summary of Test Results				
Standard	Test Item	Test Method	Class / Severity	Result
FCC CFR 47 Part 18	Conducted Emission (150 kHz to 30 MHz)	FCC OST/ MP-5:1986	18.307(b)	N/A
	Radiated Emission (9 kHz to 30 MHz)	FCC OST/ MP-5:1986	18.305(b)	N/A
	Radiated Emission (30 MHz to 1 GHz)	FCC OST/ MP-5:1986	18.305(b)	PASS
	Radiated Emission (1 GHz to 25 GHz)	FCC OST/ MP-5:1986	18.305(b)	PASS
	Radiation Hazard	FCC OST/ MP-5:1986	Clause 3.1	PASS
	Operating Frequency	FCC OST/ MP-5:1986	Clause 4.5	PASS
	Output Power Measurement	FCC OST/ MP-5:1986	Clause 4.3	PASS

Note:
This report increased alternative components Magnetron & Waveguide and adds corresponding evaluation and test based on the original model, specific refer to the above table.
EUT: In this whole report EUT means Equipment Under Test.
Only microwave function tested in this report.



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Guangdong Galanz Enterprises Co., Ltd.
Address: No.25 South Ronggui Rd., Shunde, Foshan,Guangdong, P.R. China

Manufacturer Information

Company Name: Guangdong Galanz Enterprises Co., Ltd.
Address: No.25 South Ronggui Rd., Shunde, Foshan,Guangdong, P.R. China

EUT Information

EUT Name: Microwave oven
Model: RED(X)0(Y)H-(Z)
Brand: /
Sample Status: Normal
Sample ID: #1
Sample Received Date: May 20, 2019
Date of Tested: May 20, 2019 ~ Jun 25, 2019

APPLICABLE STANDARDS	
STANDARDS	TEST RESULTS
FCC CFR 47 Part 18	PASS

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Laboratory Manager



2. TEST METHODOLOGY

All tests were performed in accordance with the standard FCC CFR 47 Part 18(FCC OST/MP-5:1986)

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4338.01) Shenzhen STS Test Services Co., Ltd. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: 625569) Shenzhen STS Test Services Co., Ltd. has been recognized to perform compliance testing on equipment subject to the Commission's Supplier's Declaration of Conformity (SDoC) and Certification rules
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Note: All tests measurement facilities use to collect the measurement data are located at 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

4. CALIBRATION AND UNCERTAINTY

4.1. Measuring Instrument Calibration

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted disturbance at mains terminals ports	0.15MHz ~ 30MHz	2	2.70 dB
Radiated disturbance Test	Below 1GHz	2	3.57dB
Radiated disturbance Test	Above 1GHz	2	4.13 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



5. EQUIPMENT UNDER TEST

5.1. Description of EUT

EUT Name	Microwave oven		
EUT Discription	The device is a microwave cooker.		
Model	RED480JAH-PA0H0A		
Series Model	RED(X)0(Y)H-(Z)		
Model Discription	<p>RED(X)0(Y)H-(Z) RED(X)0(Y)H-(Z)model designations: R: denotes "Over-The-Range" model.. E: denotes one of the electric controller. D: denotes the type of the cavity. 0: denote the output power is 1000W/950W H: denotes the Pull-out type door Variable (X): for sale area, including a combination of numbers, may be 42,45, 48,51 or 56, which don't affect the certification. Variable (Y):It represents the differences of the appearance, including combination of letters and/or numbers, which don't affect the certification. Variable (Z): may compose by one to six characters from A to Z and/or numbers from 0 to 9. It denotes one of the cosmetics of the microwave oven, which don't affect the certification. RED480JAH-PA0H0A is identical to NS-OTR16SS8Q except for the model name and brand name. RED480JBH-PA0H0A is identical to NS-OTR16SS9 except for the model name and brand name. RED480JBH-PA0H1A is identical to NS-OTR16WH9 except for the model name and brand name.</p>		
Rated Input	AC 120 V 60Hz Microwave input 1500W		
Power Supply	Power	Input	AC 120 V 60Hz

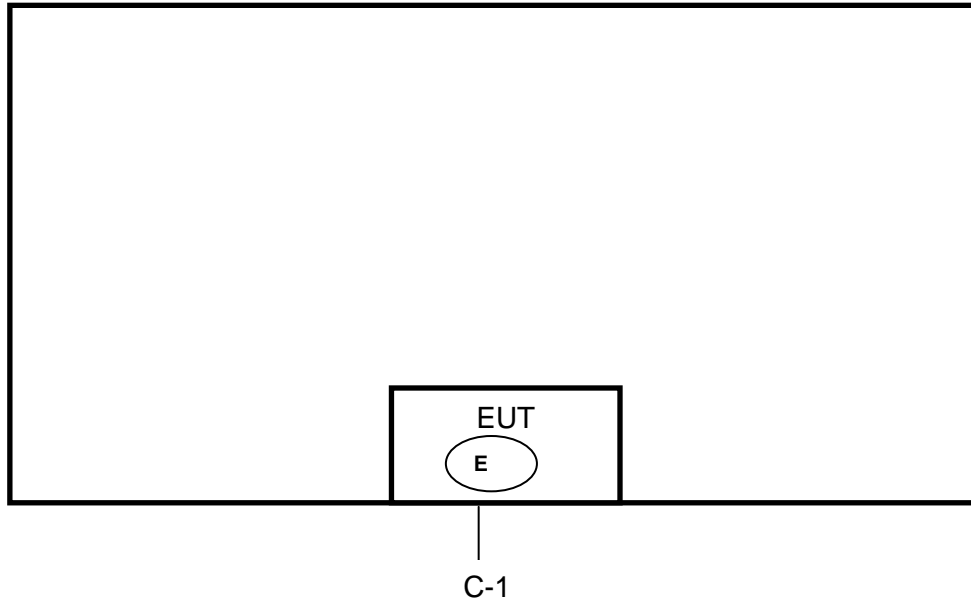
5.2. Test Mode

Test Mode	Description
Mode 1	Working Mode with max power (Microwave)
Mode 2	--

5.3. EUT Accessory

Item	Accessory	Brand Name	Model Name	Description
1				

5.4. Block Diagram Showing the Configuration of System Tested



The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
E	beaker	--	--	1000ml	--

Load for power 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 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 all other measurements: 700 milliliters of water, with the beaker located in the center of the oven.

Item	Type of cable	Shielded Type	Ferrite Core	Length
C-1	3 pins	No	No	1.0m



6. MEASURING EQUIPMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
	Test Receiver	R&S	ESCI	101427	2018.10.15	2019.10.14
	LISN	R&S	ENV216	101242	2018.10.15	2019.10.14
	Conduction Cable	EM	C01	N/A	2018.10.18	2019.10.17
	Temperature & Humidity	Mieo	HH660	N/A	2018.10.15	2019.10.14
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
	EMI Test Receiver	R&S	ESW	101535	2018.06.01	2019.05.31
	Bilog Antenna	TESEQ	CBL6111D	34678	2018.10.30	2019.10.29
	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1343	2018.10.27	2019.10.26
	SHF-EHF Horn Antenna (15G-40GHz)	BBHA 9170	SCHWARZBECK	BBHA917036 7	2018.05.02	2019.05.01
	Temperature & Humidity	HH660	Mieo	N/A	2018.10.15	2019.10.14
	Temperature & Humidity	HH660	Mieo	N/A	2018.10.15	2019.10.14
	Pre-Amplifier (0.1M-3GHz)	EM	EM330	60538	2018.10.28	2019.10.27
	Pre Amplifier (1G- 26.5GHz)	Agilent	8449B	60538	2018.10.15	2019.10.14
	Operational Manual Passive Loop (9K--30MHz)	ETS	6512	00165355	2018.10.18	2019.10.17
	Low Frequency Cable	EM	R01	N/A	2018.10.18	2019.10.17
	Low Frequency Cable	EM	R06	N/A	2018.10.18	2019.10.17
	High Frequency Cable	SCHWARZBECK	R04	N/A	2018.10.18	2019.10.17
	High Frequency Cable	SCHWARZBECK	R02	N/A	2018.10.18	2019.10.17
	Semi-anechoic Chamber	Changling	966	N/A	2018.10.15	2019.10.14
	Turn Table	EM	SC100_1	60531	N/A	N/A
	Antenna Mast	EM	SC100	N/A	N/A	N/A
	Max-full Antenna Corp	MF	MFA-440H	N/A	N/A	N/A
	Microwave Radiation Emission Meter	ETS	--	7763597	2018.10.15	2019.10.14

7. EMISSION TEST

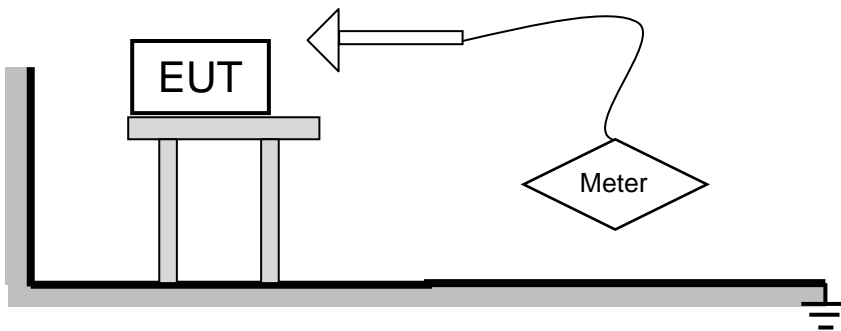
7.1. Radiation Hazard

7.1.1. Limits of Radiation Hazard

Maximum Emission, mW/cm ²
1.00

7.1.2. 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 in a beaker was located in the center of the oven and the Microwave Oven was set to maximum power. While the oven operating, the microwave meter will check the leakage and then record the maximum leakage.



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.1.3. Test Datas

Condition	Maximum Emission, mW/cm ²
A	0.11
B	0.75
C	0.11
D	0.13
E	0.23
F	0.16
G	--
M. UNCERTAINTY:	0.0002

7.2. Operating Frequency

7.2.1. Limits of Operating Frequency

ISM equipment may be operated on any frequency above 9 kHz. And the frequency band 2400-2500MHz is allocated for use by ISM equipment. (§18.301)

ISM frequency	Tolerance
6.78 MHz	±15.0 kHz
13.56 MHz	±7.0 kHz
27.12 MHz	±163.0 kHz
40.68 MHz	±20.0 kHz
915 MHz	±13.0 MHz
2,450 MHz	±50.0 MHz
5,800 MHz	±75.0 MHz
24,125 MHz	±125.0 MHz
61.25 GHz	±250.0 MHz
122.50 GHz	±500.0 MHz
245.00 GHz	±1.0 GHz

7.2.2. Test Procedure

a. FREQUENCY FOR NORMAL VOLTAGE

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.

b. FREQUENCY FOR LINE VOLTAGE

The EUT was operated / warmed by at least 10 minutes of use with a 1000 mL 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.

7.2.3. Test Datas

Item	START Frequency (MHz)	STOP Frequency (MHz)	Detector
FREQUENCY FOR NORMAL VOLTAGE	2429	2441	Peak
FREQUENCY FOR LINE VOLTAGE	2434	2449	Peak



7.3. RF Output Power Measurement

7.3.1. Test Procedure

Formula :

$$P = \frac{4.2 \times m_w(T_2 - T_1) + 0.55 \times m_c(T_2 - T_0)}{t}$$

NOTE :

P is the microwave power output, in watts

m_w is the mass of the water, in grams

m_c is the mass of the container, in grams

T₀ is the ambient temperature, in degrees Celsius

T₁ is the initial temperature of the water, in degrees Celsius

T₂ is the final temperature of the water, in degrees Celsius

t is the heating time, in seconds, excluding the magnetron filament heating-up time.

7.3.2. EUT operation

The EUT in microwave mode with full power.

7.3.3. Test Datas

Mass of water (g)	Mass of the container (g)	Ambient temperature (°C)	Initial temperature (°C)	Final temperature (°C)	Heating time (S)	Power output (watts)
1000	485	26.4	20	41.8	120	797

Note: Input power deviation is +5% or 20W(Choose the larger), -10%

7.4. Conducted Disturbance Measurement

7.4.1. Limits of conducted disturbance voltage

(A) All other part 18 consumer devices:		
Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

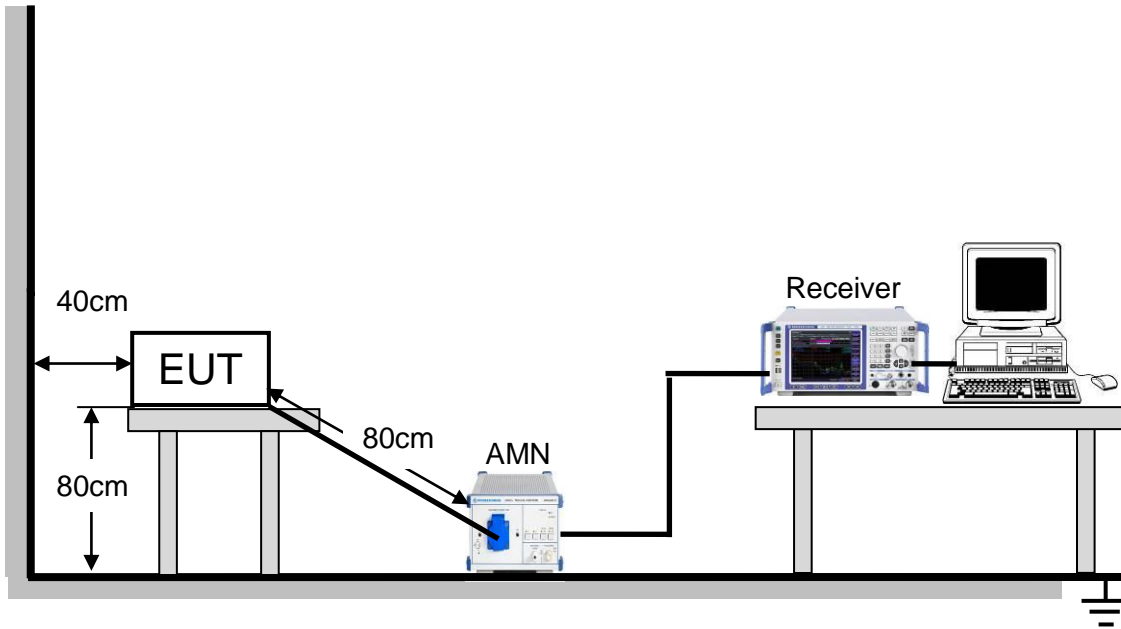
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

7.4.2. Test Procedure

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. LISN at least 80 cm from nearest part of EUT chassis.
- d. For the actual test configuration, please refer to the related Item:EUT Test Photos.

7.4.3. Test Setup



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.4.4. Test Environment

Temperature:	--°C
Humidity:	--%
ATM pressure:	--kPa

7.4.5. Test Mode

Pre-test Mode:	--
Final Test Mode:	--

Note: --



7.4.6. Test Results

Test Mode:	--
Test Voltage:	--

Phase: --
-

7.5. Radiated Disturbance Measurement

7.5.1. Limits of radiated disturbance measurement

Field strength limits

- (1) ISM equipment operating on a frequency specified in §18.305 is permitted unlimited radiated energy in the band specified for that frequency.
- (2) The field strength levels of emissions which lie outside the bands specified in §18.305, unless otherwise indicated, shall not exceed the following:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM frequency	Below 500 500 or more	25 $25 \times \text{SQRT}(\text{power}/500)$	300 ¹ 300

Power = 797W according to §18.305

Limit = $20\lg(25 \times \text{SQRT}(\text{power}/500)) + 20\lg(300/3)$ @ 3m distance.

NOTE:

- (1) The limit for radiated test was performed according to;
- (2) The tighter limit applies at the band edges;
- (3) Emission level (dBuV/m) = $20\lg$ Emission level (uV/m),
3m Emission level = 30m Emission level + $20\lg(30\text{m}/3\text{m})$;

The following table is the setting of the receiver

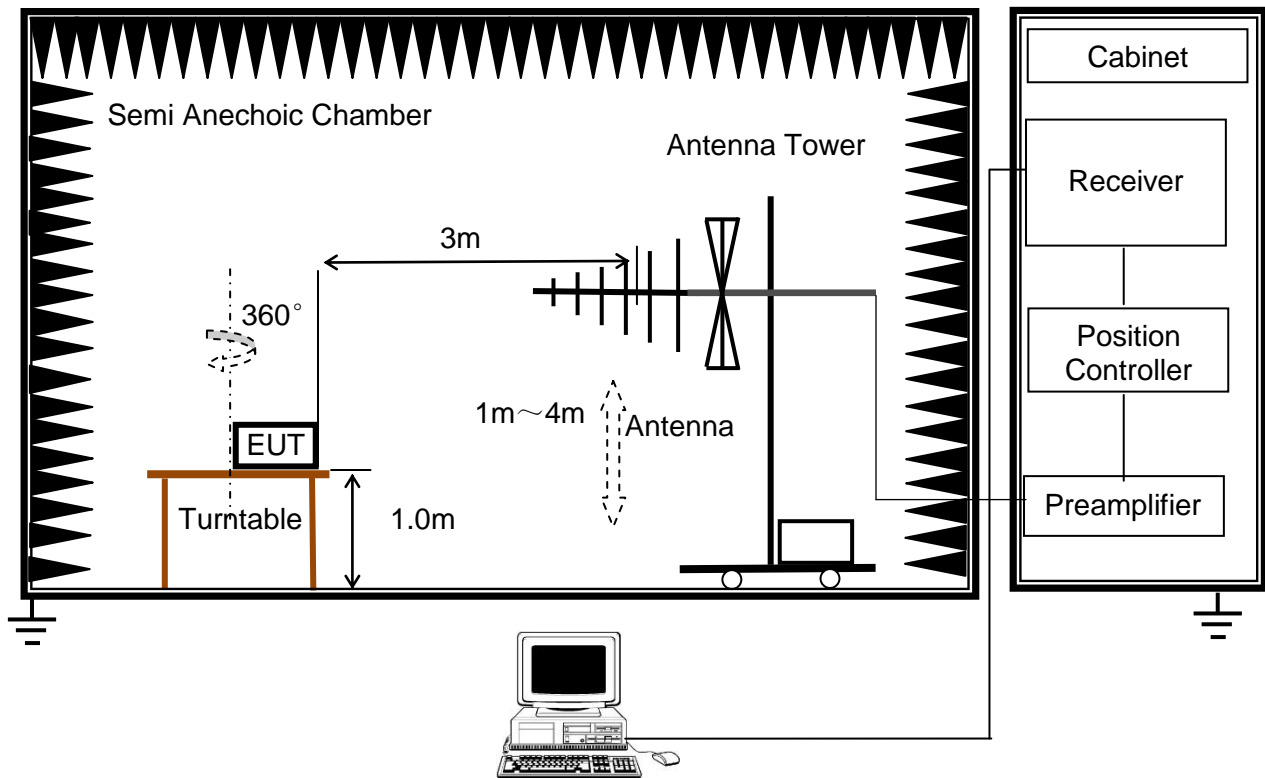
Receiver Parameters	Setting
Attenuation	-- dB
Start Frequency	0.009 MHz
Stop Frequency	25GHz
IF Bandwidth	200Hz, 9 kHz, 120 kHz, 1MHz

7.5.2. Test Procedure

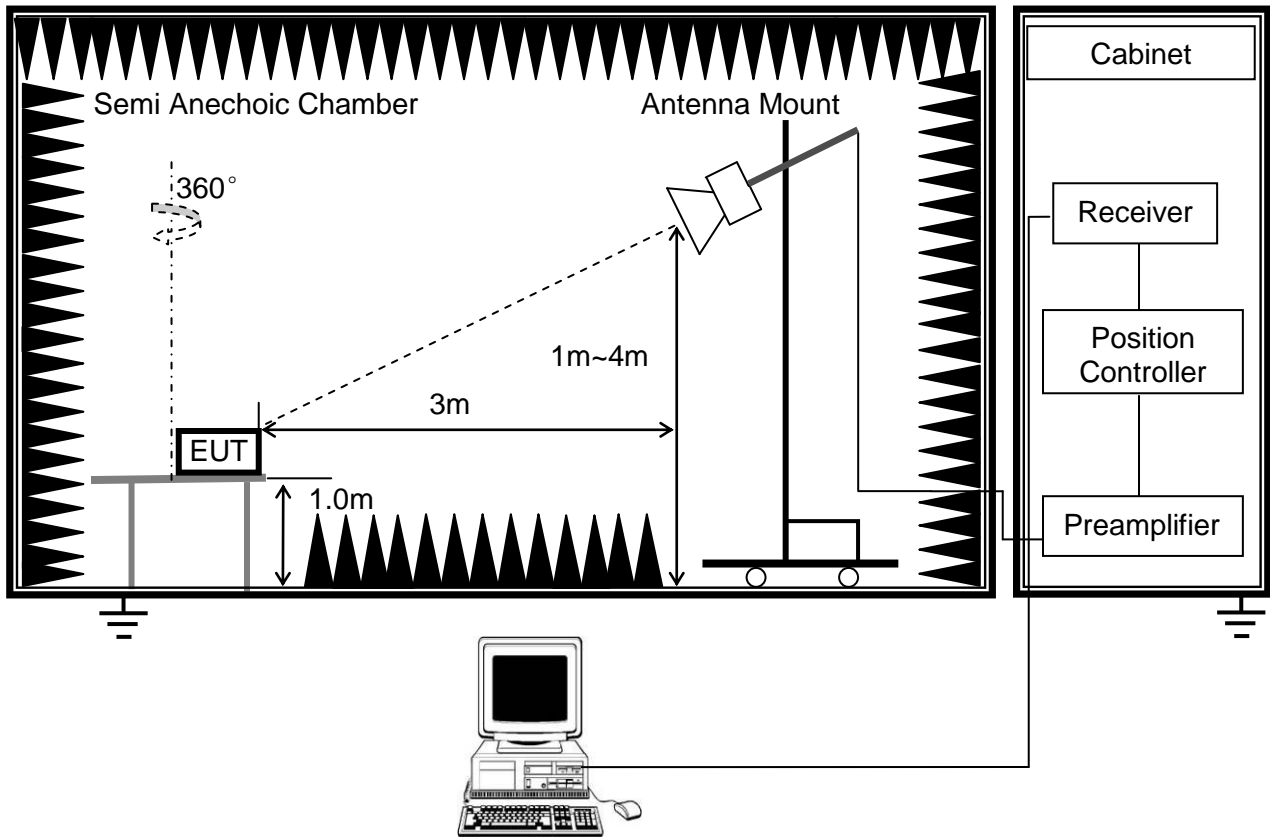
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz.
- b. The EUT was placed on the top of a rotating table 1.0 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the actual test configuration, please refer to the related Item:EUT Test Photos.

7.5.3. Test Setup

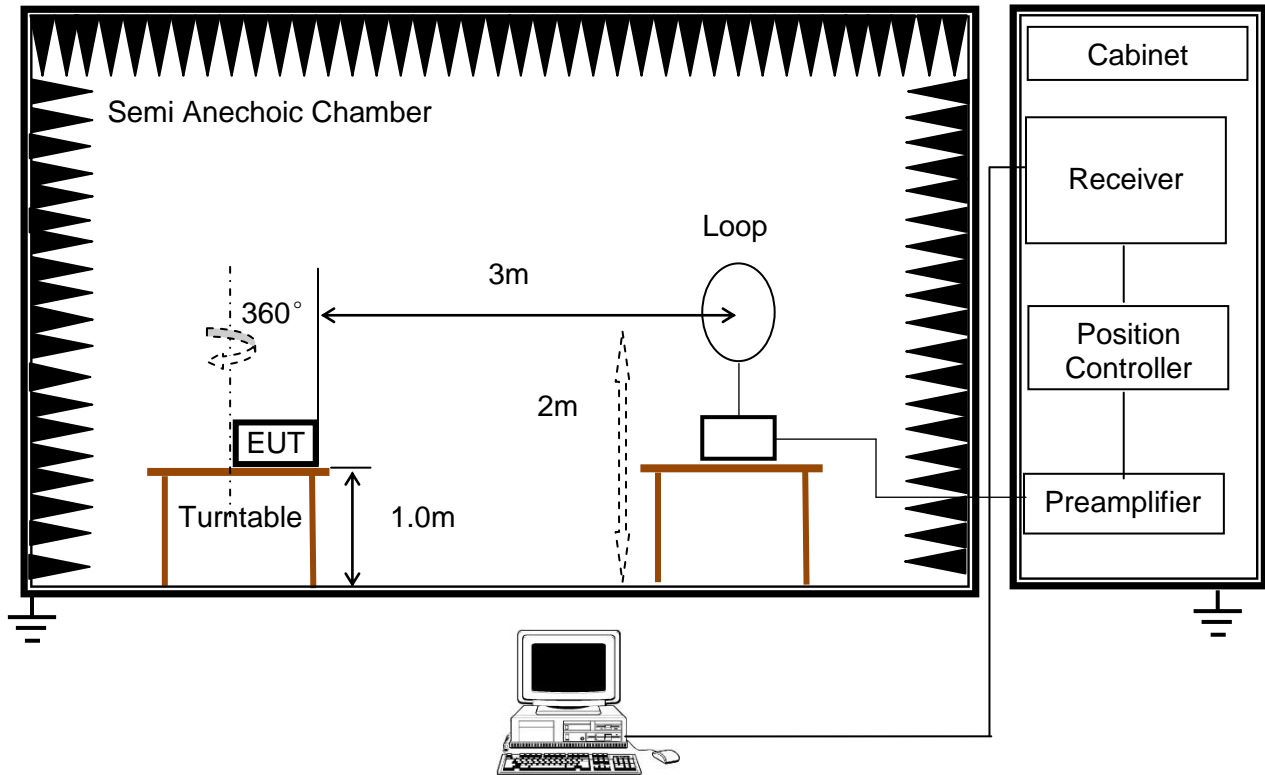
(a) Radiated Disturbance Test Set-Up Frequency 30MHz - 1GHz



(b) Radiated Disturbance Test Set-Up Frequency above 1GHz



(C) Radiated Disturbance Test Set-Up Frequency 9KHz-30MHz



For the actual test configuration, please refer to Appendix I: Photographs of the Test Configuration.

7.5.4. Test Environment

Radiated Disturbance - below 1 GHz		Radiated Disturbance - above 1 GHz	
Temperature:	24.7°C	Temperature:	27.1°C
Humidity:	57%	Humidity:	59%
ATM pressure:	101kPa	ATM pressure:	101kPa

7.5.5. Test Mode

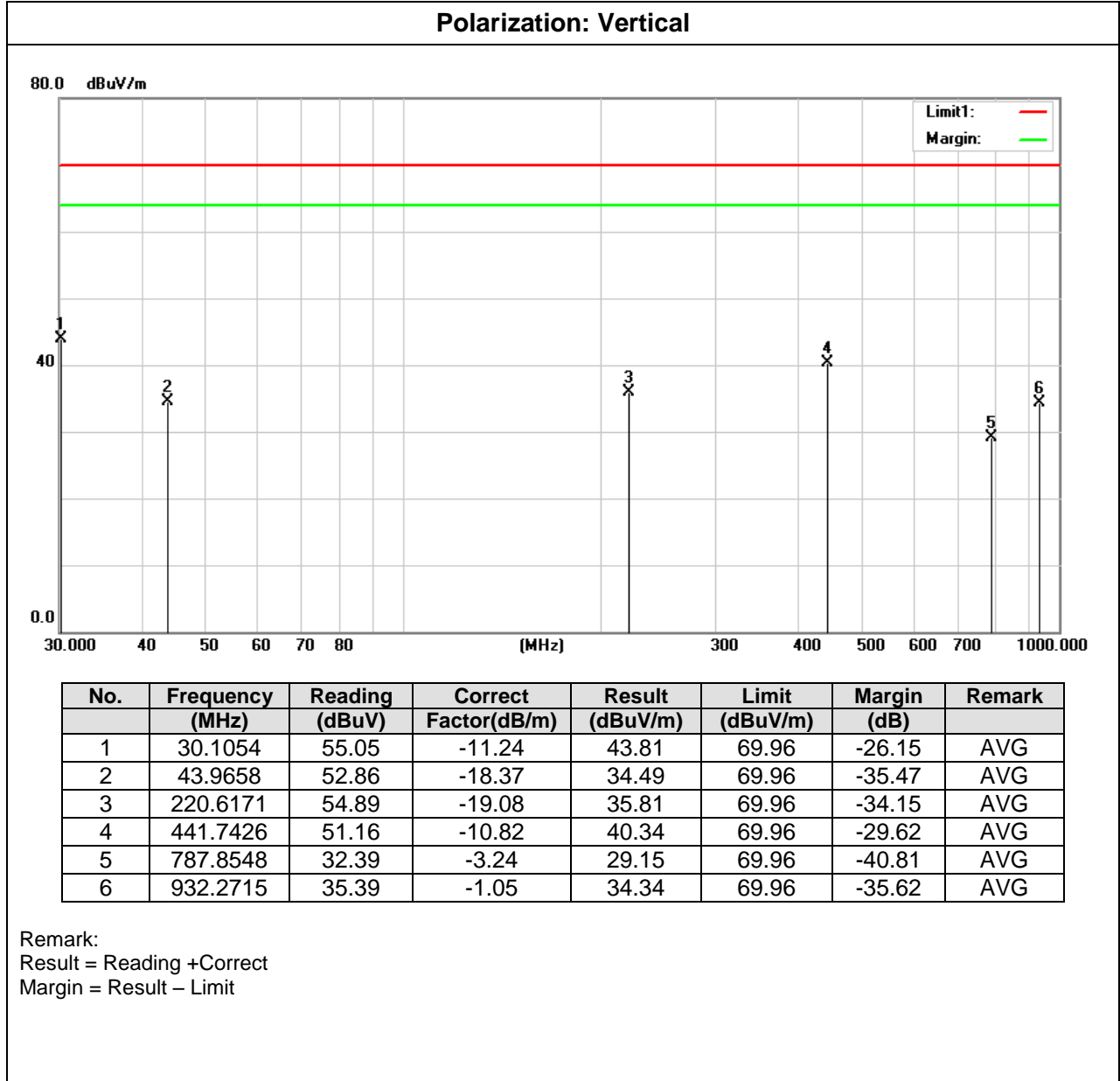
Radiated Disturbance - below 1 GHz		Radiated Disturbance - above 1 GHz	
Pre-test Mode:	Mode 1	Pre-test Mode:	Mode 1
Final Test Mode:	Mode 1	Final Test Mode:	Mode 1

Note: According to pre-test results, the final test mode is each independent function's worst case and only shown in the report.



7.5.6. Test Results – 30MHz~1GHz

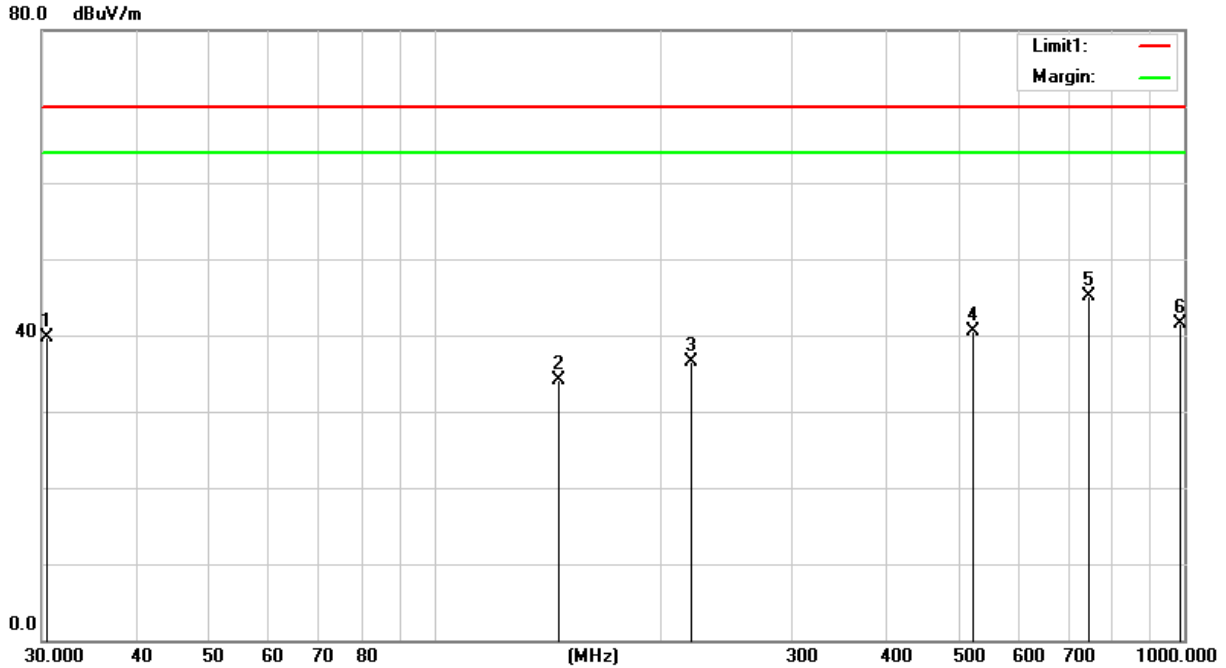
Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz





Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.4238	51.16	-11.41	39.75	69.96	-30.21	AVG
2	146.3735	51.81	-17.80	34.01	69.96	-35.95	AVG
3	219.8450	55.56	-19.13	36.43	69.96	-33.53	AVG
4	520.8882	49.20	-8.77	40.43	69.96	-29.53	AVG
5	747.4825	48.67	-3.55	45.12	69.96	-24.84	AVG
6	986.0717	41.70	-0.12	41.58	69.96	-28.38	AVG

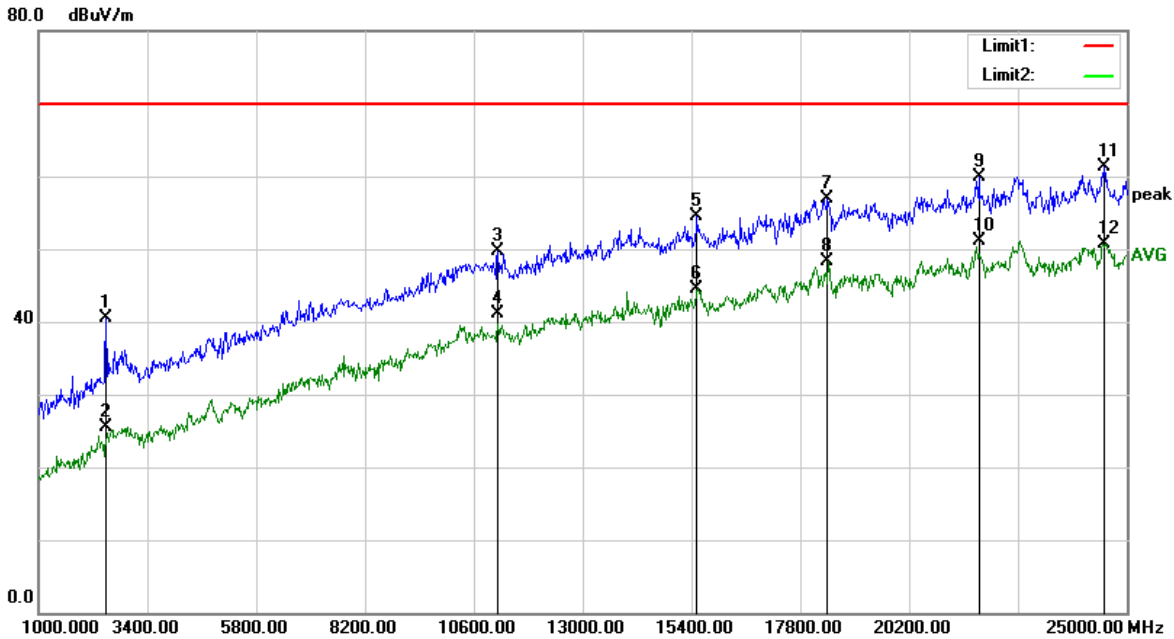
Remark:
Result = Reading + Correct
Margin = Result - Limit



7.5.7. Test Results – above 1GHz

Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz

Polarization: Vertical

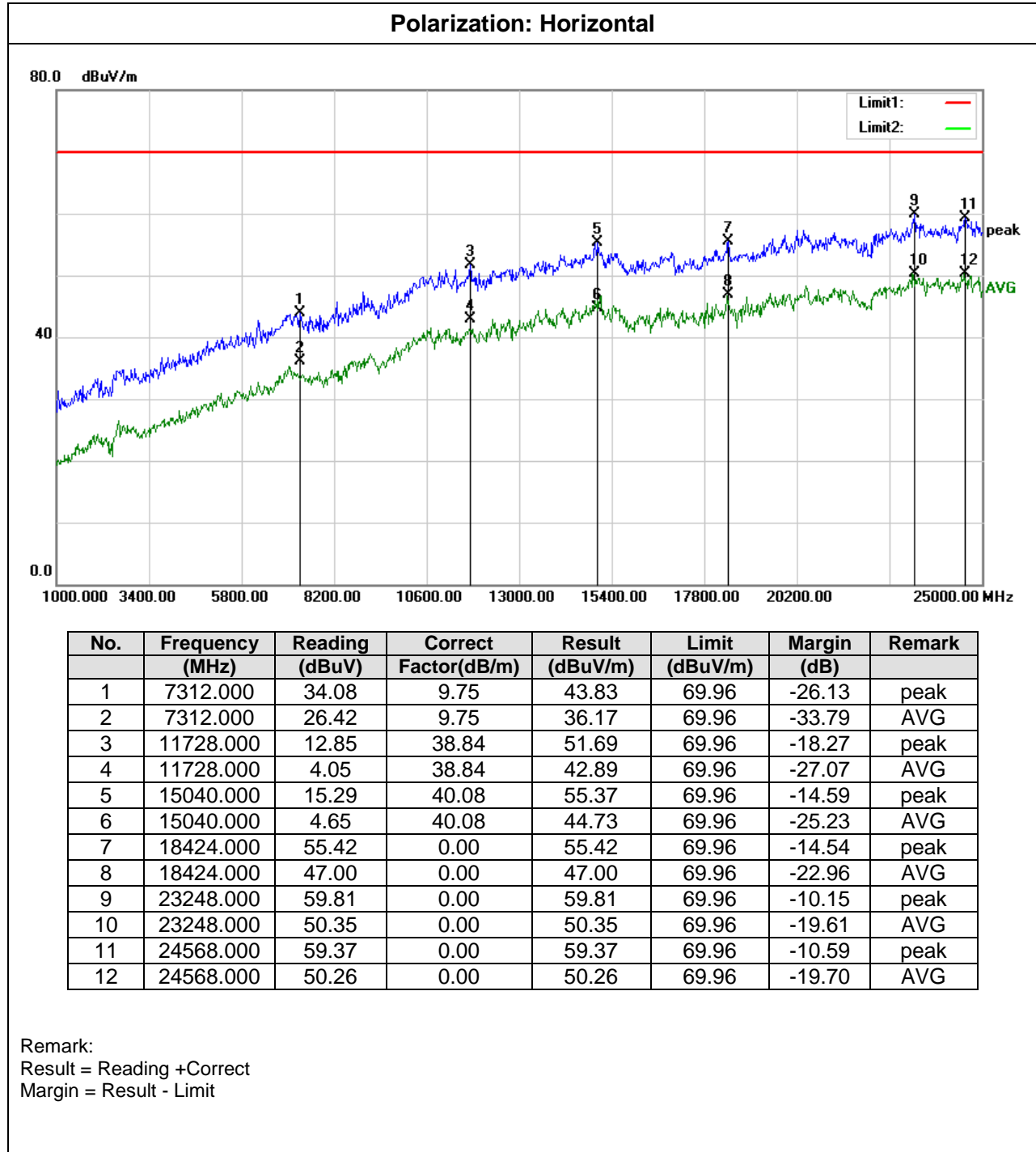


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2488.000	43.97	-3.50	40.47	69.96	-29.49	peak
2	2488.000	29.04	-3.50	25.54	69.96	-44.42	AVG
3	11128.000	10.25	39.38	49.63	69.96	-20.33	peak
4	11128.000	1.73	39.38	41.11	69.96	-28.85	AVG
5	15520.000	15.93	38.59	54.52	69.96	-15.44	peak
6	15520.000	6.00	38.59	44.59	69.96	-25.37	AVG
7	18400.000	56.91	0.00	56.91	69.96	-13.05	peak
8	18400.000	48.30	0.00	48.30	69.96	-21.66	AVG
9	21736.000	59.97	0.00	59.97	69.96	-9.99	peak
10	21736.000	51.14	0.00	51.14	69.96	-18.82	AVG
11	24496.000	61.35	0.00	61.35	69.96	-8.61	peak
12	24496.000	50.77	0.00	50.77	69.96	-19.19	AVG

Remark:
 Result = Reading +Correct
 Margin = Result - Limit



Test Mode:	Mode 1
Test Voltage:	AC 120V/60Hz





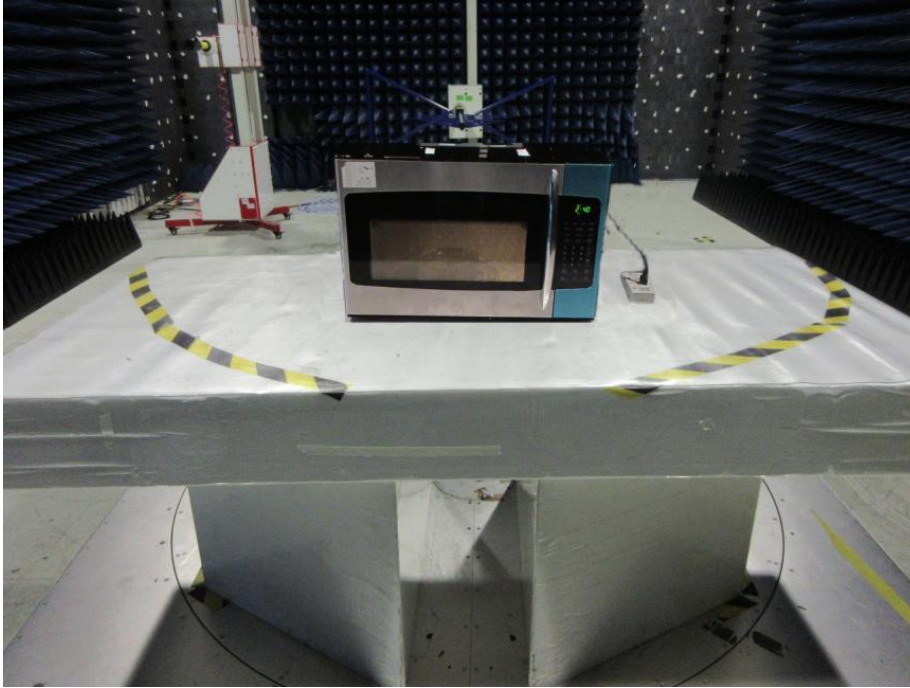
7.5.8. Test Results – 9kHz-30MHz

Test Mode:	--
Test Voltage:	--

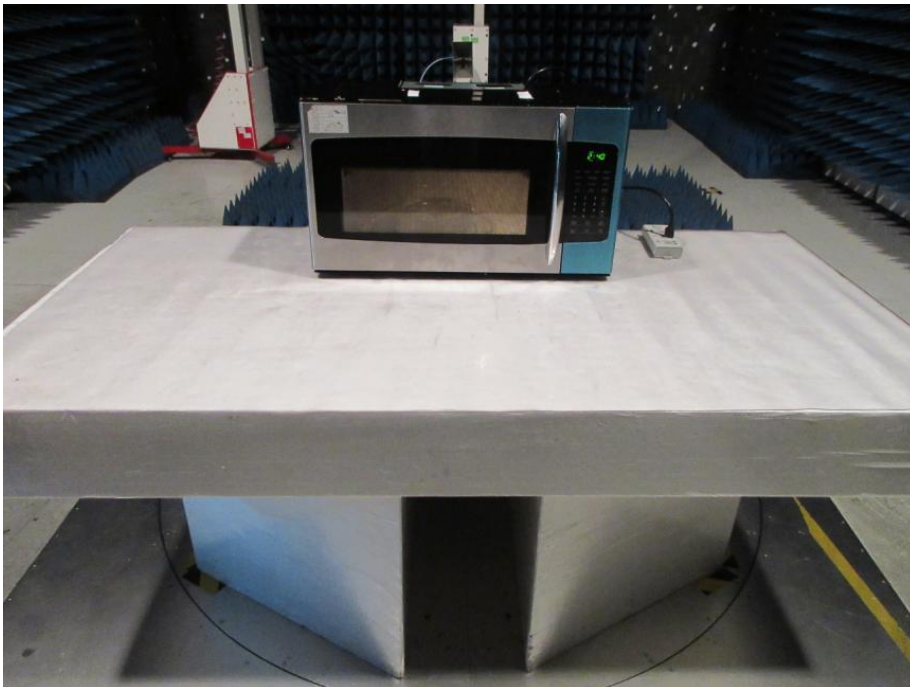
Polarization:	
Remark: Result = Reading +Correct Margin = Result - Limit	

Appendix I: Photographs of EMC Test Configuration

Radiated Disturbance below 1GHz



Radiated Disturbance above 1GHz



Radiation Hazard





Appendix II: Photographs of the EUT

External

Refer to Appendix report 4789036512.1-A1

Internal

Refer to Appendix report 4789036512.1-A2

END OF REPORT