TEST REPORT

Applicant: **Guangdong Midea Kitchen Appliances Manufacturing Co.,Ltd**

Address: No.6, Yong An Road, Beijiao, Shunde, Foshan ,Guangdong,China

FCC ID: **VG8XC9P04YYK**

Product Name: **Microwave Oven**

Model Number: **TC9P04-S00K00**

Standard(s): **FCC PART 18**
FCC MP-5:1986

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: **CR230208527-00**

Date Of Issue: **2023/4/24**

Reviewed By: **Sun Zhong** Sun Zhong

Title: Manager

Test Laboratory: **China Certification ICT Co., Ltd (Dongguan)**
No. 113, Pingkang Road, Dalang Town, Dongguan,
Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230208527-00	Original Report	2023/4/24

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Microwave Oven
EUT Model:	TC9P04-S00K00
Highest Operation Frequency:	2450 MHz
Microwave Output Power:	900 W
Input Power:	1500 W
Serial Number:	22II-1
EUT Received Date:	2023/3/1
EUT Received Status:	Good

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in maximum (continuous) RF output power, which was provided by the manufacturer. The loads consisted of water in a glass beaker in the amounts specified in the test procedure Test Model: Operation
Equipment Modifications:	No
EUT Exercise Software:	No

1.2.2 Support Equipment List and Details

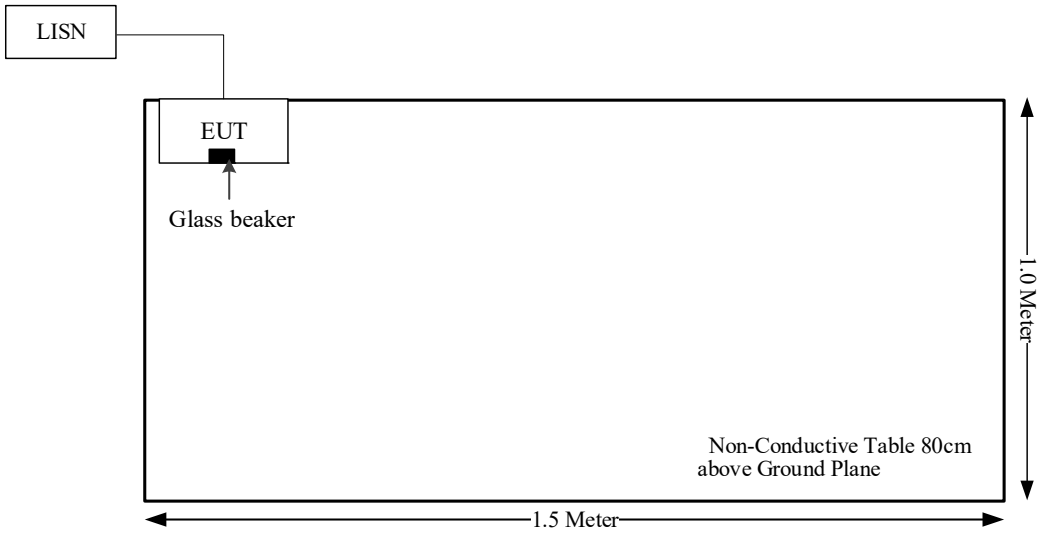
Manufacturer	Description	Model	Serial Number
Unknown	Glass beaker	Unknown	Unknown

1.2.3 Support Cable List and Details

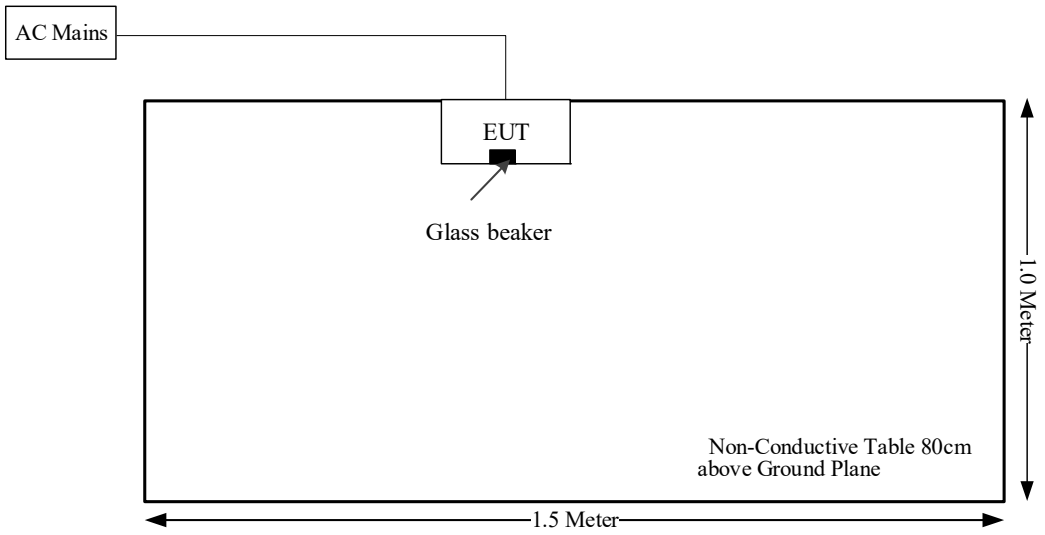
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power Cable	No	No	1.2m	Socket	EUT

1.2.4 Block Diagram of Test Setup

Conducted emissions:



Radiated emissions:



1.3 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.15 dB,200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

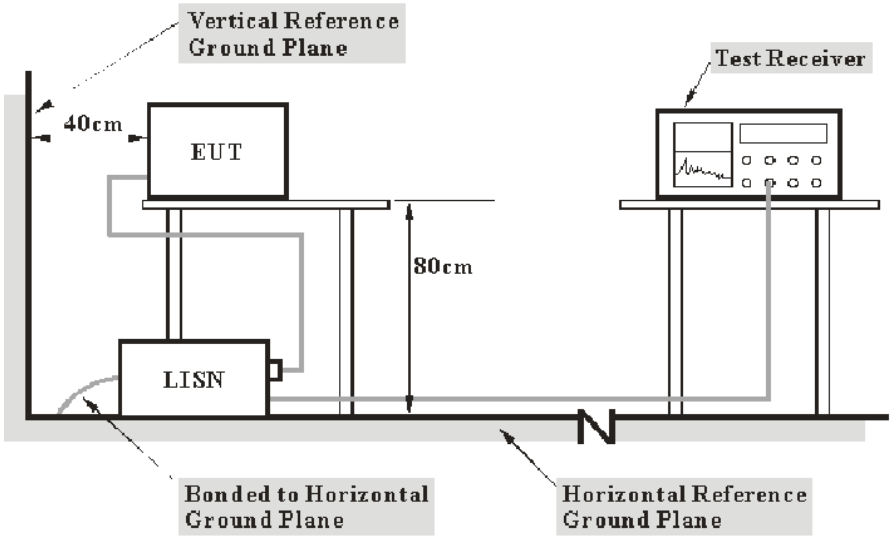
2. SUMMARY OF TEST RESULTS

Standard Clause	Description of Test	Test Result
FCC §18.307	Conducted emissions	Compliant
FCC §18.305, §18.309	Radiated emissions	Compliant
FCC/OST MP-5 FCC §18.301	Radiation Hazard Measurement	Compliant
FCC §18.305	Field Strength	Compliant
FCC §18.313, §1.1310, §2.1091	Maximum Permissible Exposure	Compliant

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 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. The specification used was with the FCC Part 18.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

3.1.2 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:

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

3.1.3 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT, the report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

All data was recorded in the Quasi-peak and average detection mode.

The report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

3.1.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = attenuation caused by cable loss + voltage division factor of AMN

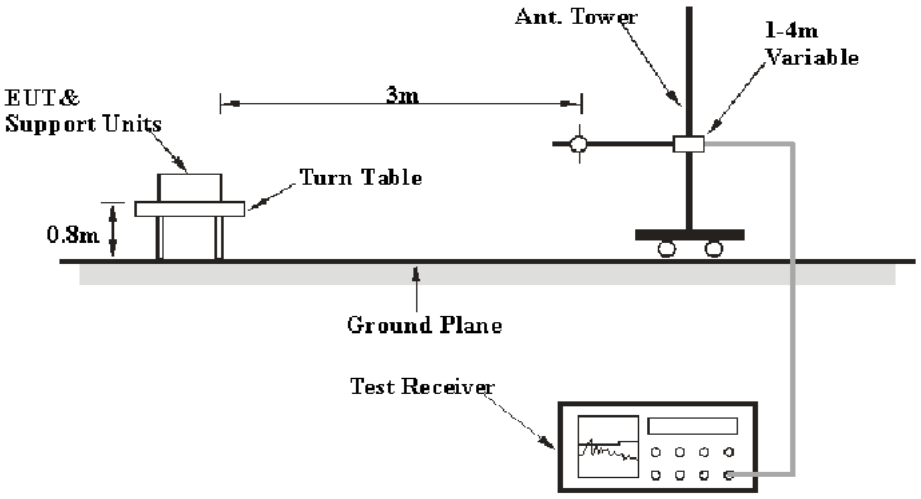
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

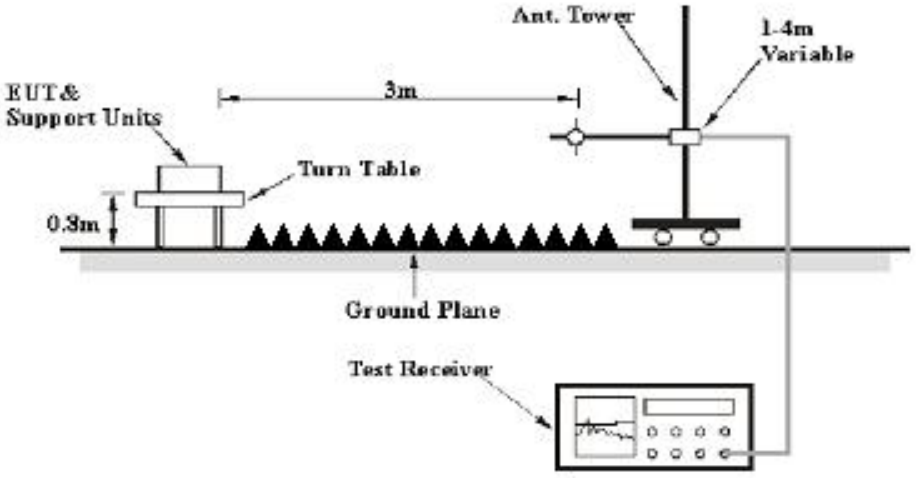
3.2 Radiation Spurious Emissions

3.2.1 EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission were performed in the 3 meters chamber test site, using the setup accordance with the FCC MP-5. The specification used was the FCC part 18 limits.

3.2.2 EMI Test Receiver Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10Hz	/	AVG

If the maximized peak measured value complies with under the limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

3.2.3 Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

All emissions under the average limit and under the noise floor have not recorded in the report.

3.2.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = Antenna Factor + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

3.3 Radiation Hazard Measurement

3.3.1 Applicable Standard

FCC §18.301

3.3.2 Test Procedure

1) **Input Power**

Input power and current was measured using a power analyzer. A 1000 mL water load was placed in the center of the oven and the 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.

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 500watts or fraction thereof in excess of 1000 watts. Additional beakers were used if necessary.

● 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.

2) RF Output Power

A cylindrical container of borosilicate glass is used for the test. It has a maximum thickness of 3 mm, an external diameter of approximately 190 mm and a height of approximately 90 mm. The mass of the container is determined.

At the start of the test, the oven and the empty container are at ambient temperature. Water having an initial temperature is used for the test. The water temperature is measured immediately before it is poured into the container.

A quantity of 1000 g ± 5 g of water is added to the container and its actual mass obtained. The container is then immediately placed in the centre of the oven shelf, which is in its lowest normal position. The oven is operated and the time for the water temperature to attain is measured. The oven is then switched off and the final water temperature is measured within 60 s.

3) Operating Frequency

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.

Variation in Operating Frequency with 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.

4. TEST DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	22II-1	Test Date:	2023/04/10
Test Site:	CE	Test Mode:	Operation
Tester:	David Huang	Test Result:	Pass

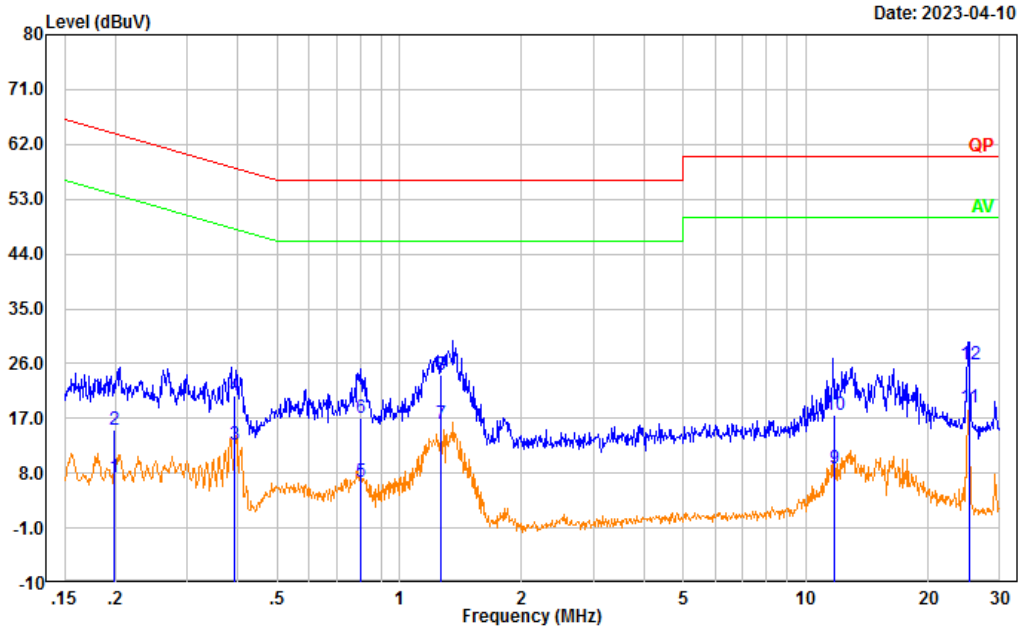
Environmental Conditions:					
Temperature: (℃)	23	Relative Humidity: (%)	61	ATM Pressure: (kPa)	101.3

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2023/03/31	2024/03/30
R&S	EMI Test Receiver	ESR3	102726	2022/07/15	2023/07/14
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2022/08/07	2023/08/06
Audix	Test Software	E3	190306 (V9)	N/A	N/A

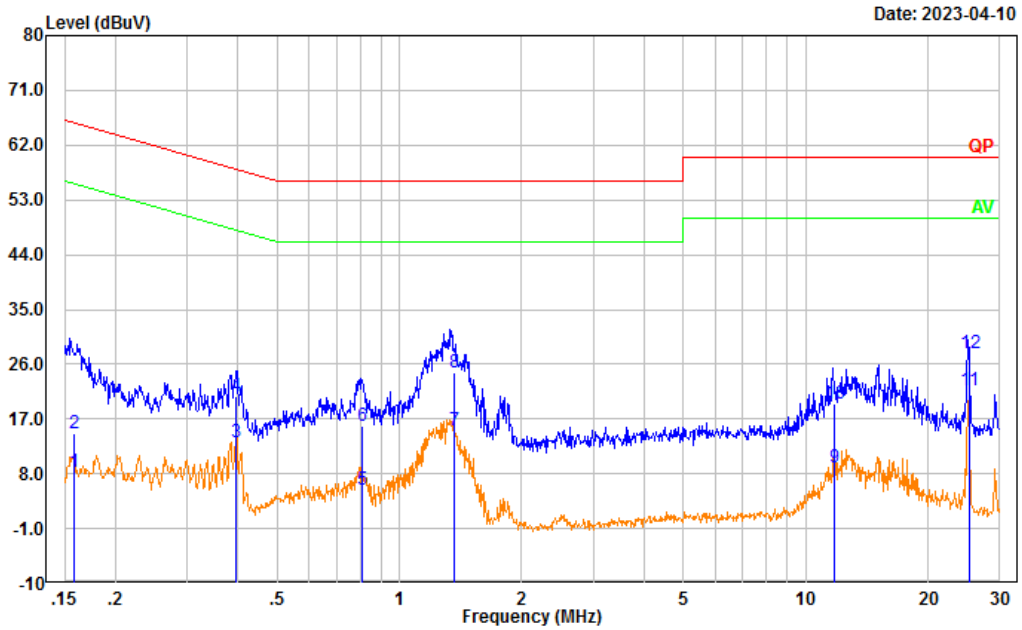
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.199	-2.32	9.61	7.29	53.63	46.34	Average
2	0.199	5.49	9.61	15.10	63.63	48.53	QP
3	0.394	2.96	9.61	12.57	47.97	35.40	Average
4	0.394	11.05	9.61	20.66	57.97	37.31	QP
5	0.803	-3.13	9.62	6.49	46.00	39.51	Average
6	0.803	7.51	9.62	17.13	56.00	38.87	QP
7	1.263	6.57	9.62	16.19	46.00	29.81	Average
8	1.263	14.46	9.62	24.08	56.00	31.92	QP
9	11.760	-0.91	9.67	8.76	50.00	41.24	Average
10	11.760	8.01	9.67	17.68	60.00	42.32	QP
11	25.208	9.01	9.81	18.82	50.00	31.18	Average
12	25.208	15.92	9.81	25.73	60.00	34.27	QP

Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.159	-1.35	9.61	8.26	55.52	47.26	Average
2	0.159	5.01	9.61	14.62	65.52	50.90	QP
3	0.395	3.65	9.61	13.26	47.95	34.69	Average
4	0.395	11.11	9.61	20.72	57.95	37.23	QP
5	0.811	-4.29	9.62	5.33	46.00	40.67	Average
6	0.811	6.13	9.62	15.75	56.00	40.25	QP
7	1.362	5.49	9.62	15.11	46.00	30.89	Average
8	1.362	15.02	9.62	24.64	56.00	31.36	QP
9	11.724	-0.60	9.67	9.07	50.00	40.93	Average
10	11.724	9.90	9.67	19.57	60.00	40.43	QP
11	25.215	12.01	9.76	21.77	50.00	28.23	Average
12	25.215	17.93	9.76	27.69	60.00	32.31	QP

4.2 Radiation Spurious Emissions

Serial Number:	22II-1	Test Date:	2023/04/05~2023/04/19
Test Site:	966-2, 966-1	Test Mode:	Operation
Tester:	Vic Du, Mack Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24~24.3	Relative Humidity: (%)	60~63	ATM Pressure: (kPa)	99.9~100.2

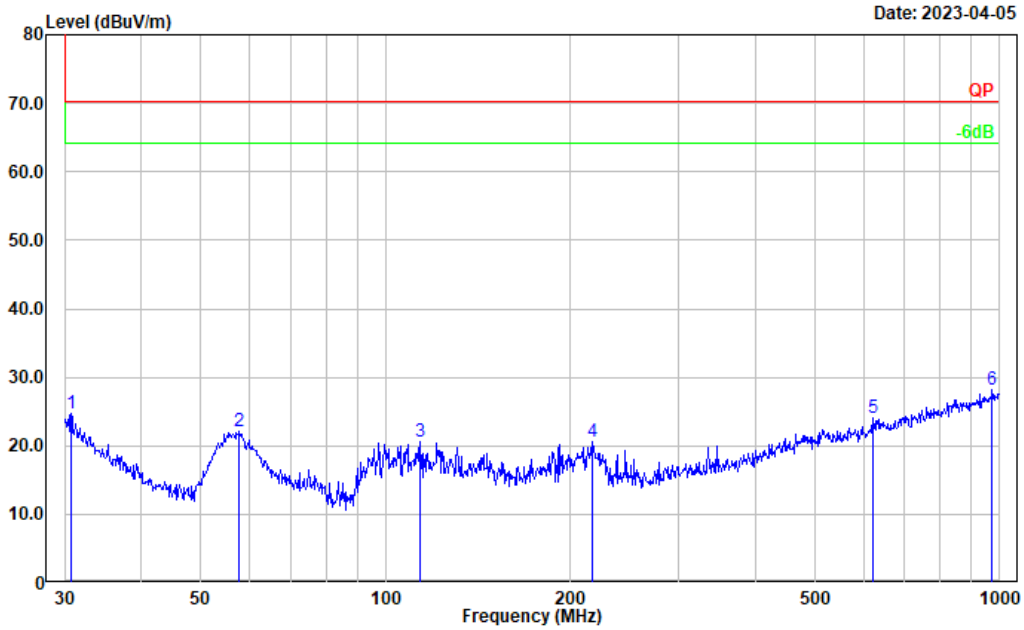
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020/10/19	2023/10/18
R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022/07/17	2023/07/16
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2022/07/17	2023/07/16
Sonoma	Amplifier	310N	186165	2022/07/17	2023/07/16
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020/10/13	2023/10/12
R&S	Spectrum Analyzer	FSV40	101591	2022/07/15	2023/07/14
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2022/08/07	2023/08/06
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2022/08/07	2023/08/06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/09	2023/11/08
Audix	Test Software	E3	201021 (V9)	N/A	N/A
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021/02/05	2024/02/04
AH	Preamplifier	PAM-1840VH	190	2022/11/09	2023/11/08
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2022/08/07	2023/08/06
E-Microwave	Band Rejection Filter	2400-2483.5MHz	OE01902424	2022/08/07	2023/08/06
Mini Circuits	High Pass Filter	VHF-6010+	31119	2022/08/07	2023/08/06

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

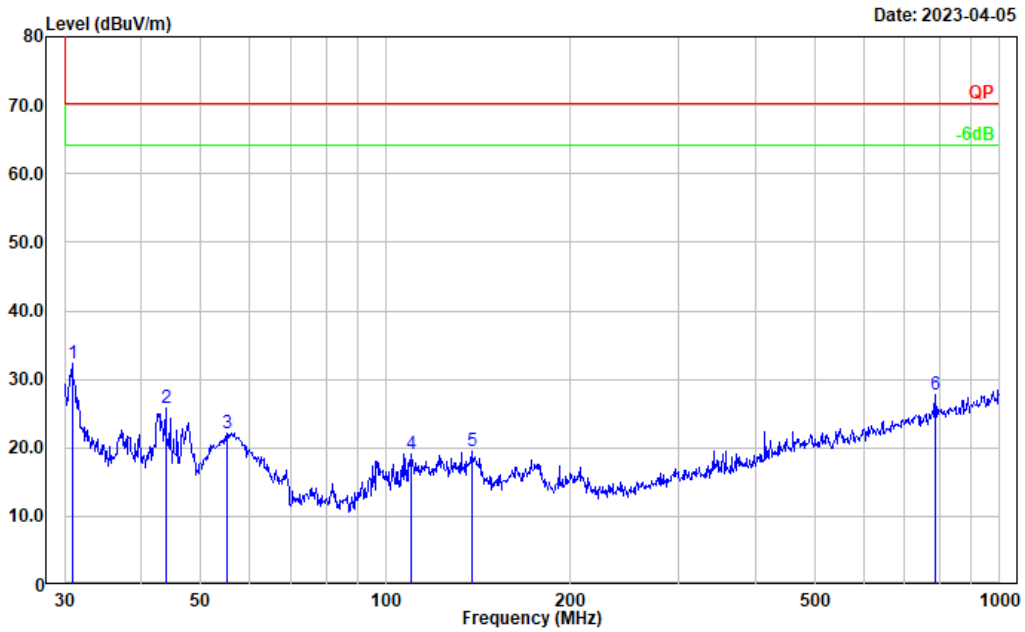
1) 30MHz-1GHz:

Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.745	28.96	-4.17	24.79	70.19	45.40	Peak
2	57.796	39.44	-17.35	22.09	70.19	48.10	Peak
3	113.714	32.63	-12.01	20.62	70.19	49.57	Peak
4	216.783	33.26	-12.68	20.58	70.19	49.61	Peak
5	622.890	28.80	-4.65	24.15	70.19	46.04	Peak
6	972.337	27.97	0.32	28.29	70.19	41.90	Peak

Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.853	36.63	-4.26	32.37	70.19	37.82	Peak
2	43.812	39.44	-13.56	25.88	70.19	44.31	Peak
3	55.221	39.50	-17.29	22.21	70.19	47.98	Peak
4	109.796	31.38	-12.36	19.02	70.19	51.17	Peak
5	137.903	31.30	-11.79	19.51	70.19	50.68	Peak
6	785.093	30.09	-2.33	27.76	70.19	42.43	Peak

2) 1-25GHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
1000ml water							
4912.200	48.03	AV	H	11.16	59.19	70.19	11.00
4929.300	50.82	AV	H	11.19	62.01	70.19	8.18
7369.800	47.39	AV	H	14.84	62.23	70.19	7.96
7386.600	40.59	AV	H	14.89	55.48	70.19	14.71
700ml water							
4914.000	54.37	AV	H	11.16	65.53	70.19	4.66
4914.000	57.34	AV	V	11.16	68.50	70.19	1.69
7359.000	47.35	AV	H	14.81	62.16	70.19	8.03
7359.000	41.37	AV	V	14.81	56.18	70.19	14.01
300ml water							
4914.000	50.37	AV	H	11.16	61.53	70.19	8.66
4914.000	49.67	AV	V	11.16	60.83	70.19	9.36
7359.000	38.64	AV	H	14.81	53.45	70.19	16.74
7359.000	36.54	AV	V	14.81	51.35	70.19	18.84

4.3 Radiation Hazard Measurement

Serial Number:	22II-1	Test Date:	2023/03/07
Test Site:	966-1	Test Mode:	Transmitting
Tester:	coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24.3	Relative Humidity: (%)	45	ATM Pressure: (kPa)	101.5

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020/10/13	2023/10/12
R&S	Spectrum Analyzer	FSV40	101591	2022/07/15	2023/07/14
R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2022/08/07	2023/08/06
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2022/08/07	2023/08/06
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/09	2023/11/08
YOKOGAWA	Digital Power Meter	WT210	CR23142113	2022/08/07	2023/08/06
FLLIKE	Temperature measuring instrument	725	BC-TL-504	2022/04/15	2023/04/24
Dingxing	Electronic Balance	DSII-861	215219	2022/09/09	2023/09/08
Audix	Test Software	E3	201021 (V9)	N/A	N/A

**** Statement of Traceability:*** *China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

1) Input Power

Input Voltage (V_{AC}/Hz)	Input Current (Amps)	Measured Input Power (Watts)	Rated Input Power (Watts)
117.32	13.21	1549.80	1500

☒ Based on the measured input power, the EUT was found to be operating within the intended specifications.

2) RF Output Power

m_w (g)	m_c (g)	T_0 (ºC)	T_1 (ºC)	T_2 (ºC)	t (s)
1000	377	24.8	10.2	18.7	41

RF Output Power = (4.187 x_1000_x (18.7-10.2) + 0.55 x 377.0 x (18.7- 24.8)) / 41= 837.187 Watts
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;
T_0 is the ambient temperature, in degrees Celsius;
T_1 is the initial temperature of the water, in degrees Celsius;
T_2 is the final temperature of the water, in degrees Celsius;
t is the heating time, in seconds, excluding the magnetron filament heating-up time.

☐ The measurement output power was found to be less than 500 watts. Therefore, in accordance with Section 18.305 of Subpart-C, the measured out-of-band emissions were compared to the limit of 25µV/meter at a 300-meter measurement distance.

☒ The measured output power was found to exceed 500 watts. 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)

LFS = 25*SQRT (837.187/500)

LFS = 32.35

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

LFS µV/m@300m	dBµV/m@300m	dBµV/m@3m
32.35	30.19	70.19

Note: Limit (dBµV/m@3m) = Limit (dBµV/m@300m) + 40(dB)

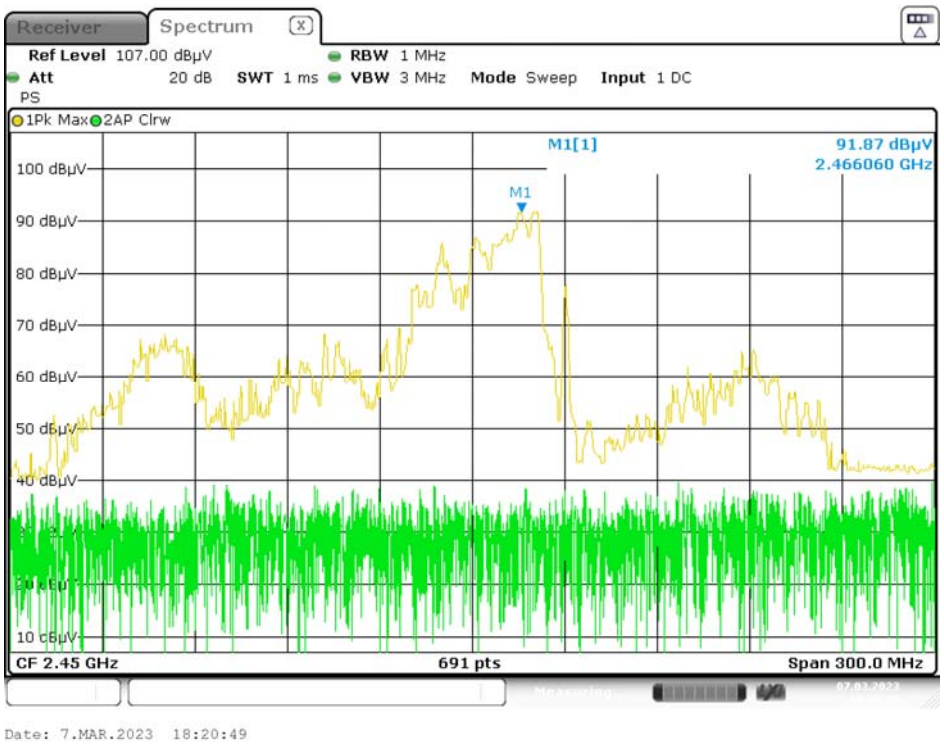
3) Operating Frequency

Variation in Operating Frequency with Time

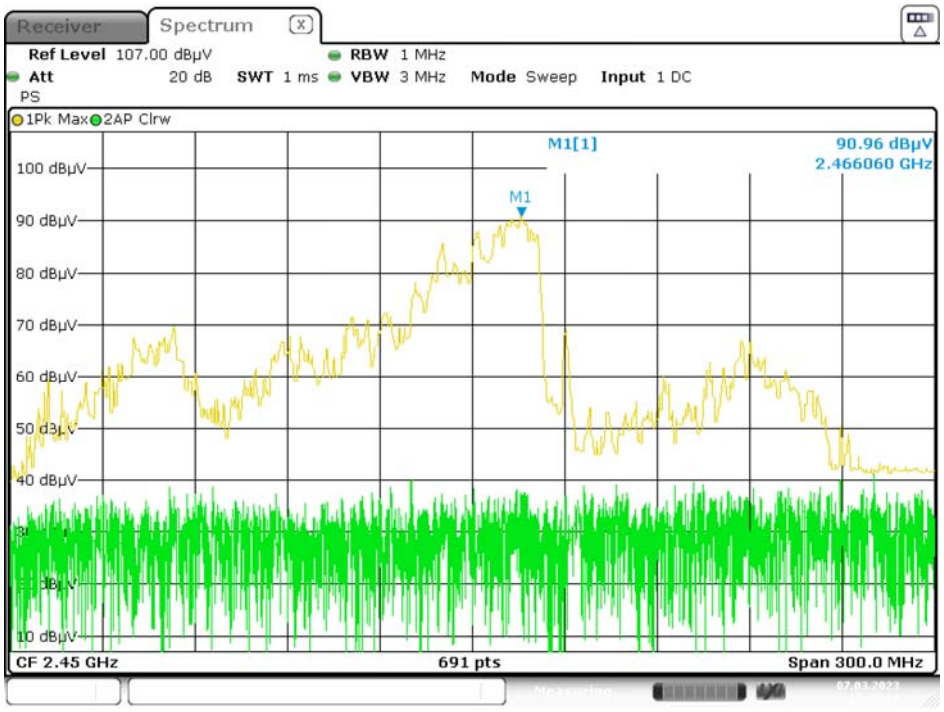
Frequency at Start time (MHz)	Frequency at End time (MHz)
2466.06	2466.06

Refer to data pages for details of the variation in operating frequency with time measurement.

Start time:



End time:


Receiver
Spectrum
Ref Level 107.00 dBµV
RBW 1 MHz
Att 20 dB SWT 1 ms VBW 3 MHz Mode Sweep Input 1 DC
PS
1Pk Max 2AP Clrw
M1[1]
90.96 dBµV
2.466060 GHz
M1
100 dBµV
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
10 dBµV
CF 2.45 GHz
691 pts
Span 300.0 MHz
Date: 7.MAR.2023 18:30:17

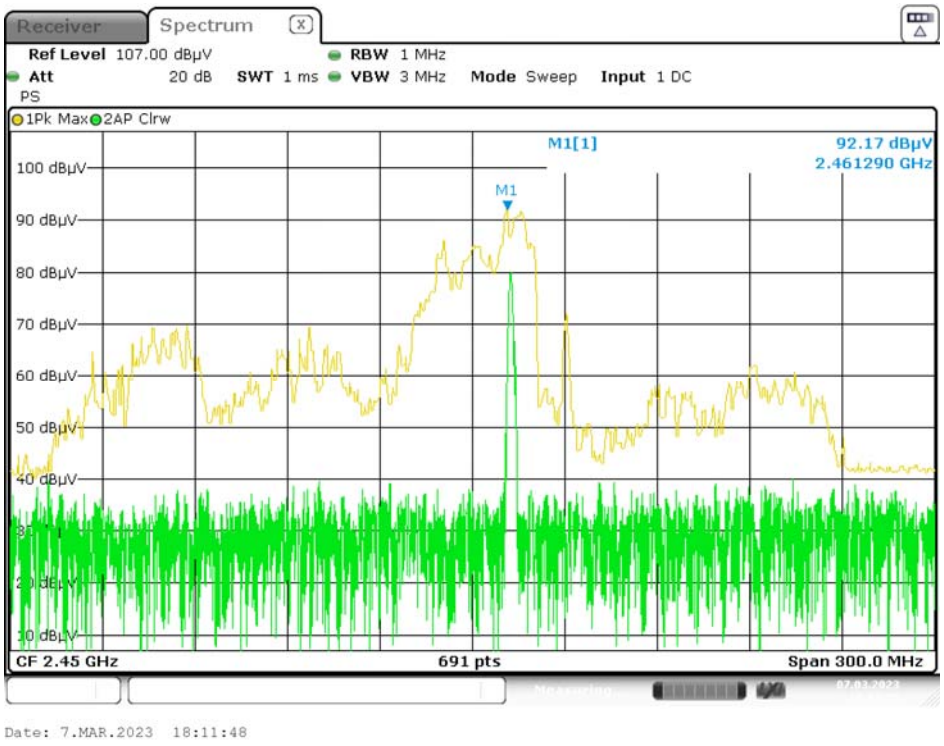
Variation in Operating Frequency with Line Voltage

Line voltage varied from 96 V_{AC} to 150 V_{AC}.

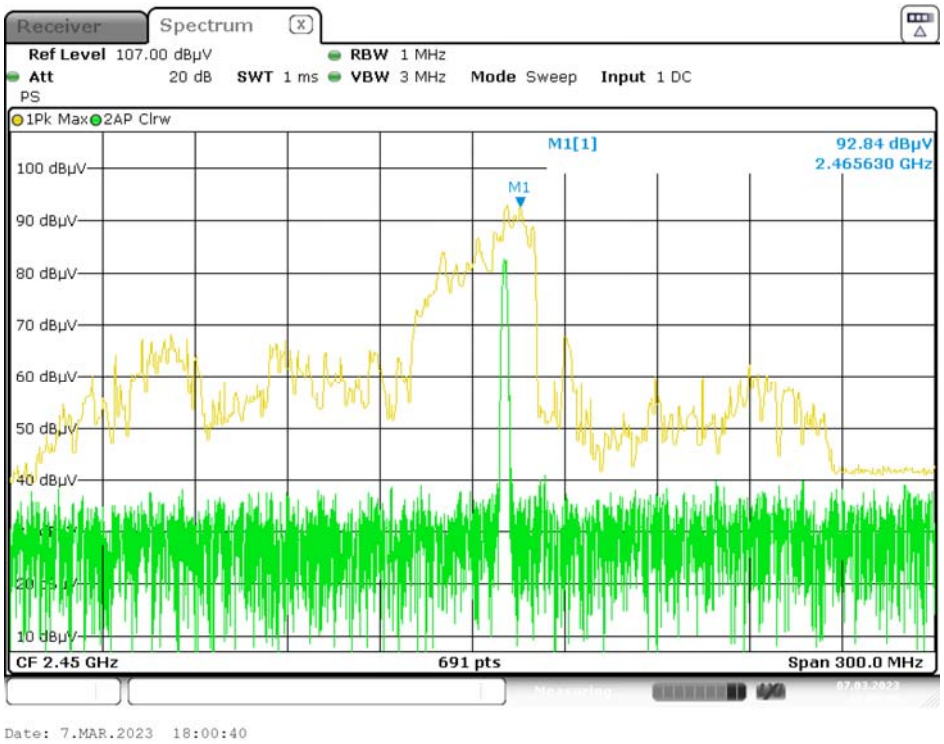
(Low voltage) Frequency (MHz)	(High voltage) Frequency (MHz)
2461.29	2465.63

Please refer to following pages for details of the variation in operating frequency with line voltage measurement.

Low Voltage:



High Voltage:



5. RF EXPOSURE EVALUATION

5.1 Maximum Permissible Exposure (MPE)

5.1.1 Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

5.1.2 Limits

Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

5.1.3 Measurement

Radiation leakage was measured in the as-received condition with the oven door closed using a microwave leakage meter.

A 275 mL water load was placed in the center of the oven and the oven was operated at maximum output power.

☒ There was no microwave leakage exceeding a power level of 0.1mW/cm^2 observed at any point 5 cm 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.

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