FCC MPE REPORT

Report No.:	20230817G10100X-E-1
Product Name:	Microwave Oven
Trade Name:	Midea, SHARP
Model Number:	TM048K##-PH, TM048K***-PH, SMO1759JS
FCC ID:	VG8TM048KYYW
Applicant:	Guangdong Midea Kitchen Appliances Manufacturing Co., Ltd.
Received Date:	2023.08.16
Test Data:	2023.08.24-2023.08.24
Issued by:	CCIC Southern Testing Co., Ltd.
Lab Location:	Electronic Testing Building, No.43, Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China **Tel:** 86 755 26627338 **Fax:** 86 755 26627238

This test report consists of **5** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit

MAXIMUM PERMISSIBLE EXPOSURE REPORT

Product Name.....:	Microwave Oven
Model Number.....:	TM048K##-PH, TM048K***-PH, SMO1759JS
Trade Name.....	Midea, SHARP
Applicant.....:	Guangdong Midea Kitchen Appliances Manufacturing Co., Ltd.
Applicant Address.....:	No.6, Yong An Road, Beijiao, Shunde, Foshan, China
Manufacturer .....:	Guangdong Midea Kitchen Appliances Manufacturing Co., Ltd.
Manufacturer Address ...:	No.6, Yong An Road, Beijiao, Shunde, Foshan, China
Standard(s) .....:	FCC/OST MP-5(1986), OET Bulletin 56(1999)
Test Result.....:	PASS
Tested by .....:	Ruihong Xie
	Ruihong Xie Test Engineer 2023.08.25
Reviewed by .....:	Chris You
	Chris You Senior Engineer 2023.08.25
Approved by .....:	Yang Fan
	2023.08.25
	Yang Fan, Manager

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

EUT Name ..... :	Microwave Oven
Trade Name……...:	Midea, SHARP
Model…….:	TM048K##-PH, TM048K***-PH, SMO1759JS model designations as follow: T: Touch type keypad; M: indicates microwave function; 048: “0” indicates the microwave output power is 1000W; “48” indicates cavity capacity is 48 liters; K: Indicates the design No.; ## or ***: "#", "*" may be 0~9, A~Z or blank, indicates different appearance; -P: Indicate Painted (Steel) Cavity, Stand for transduction function; H: indicates Humidity sensor. Customer model “SMO1759JS” with trade mark as “SHARP”. Model of TM048K6SF-PH was selected for final testing.
Power Supply ..... :	120VAC/60Hz
Rated input Power(microwave):	1500W
Rated output Power(microwave):	1000W
Frequency..... :	2450MHz (Class B/Group 2)
Magnetron Model..... :	2M319J
Magnetron Manufacturer ... :	WITOL
RF…….:	Buit-in a 2.4GHz Wi-Fi & Bluetooth Internet of Things Module
RF Module Type……:	Single modular
Contain Modular FCC ID……:	2AC7Z-ESP32PICOZERO
Frequency of RF……:	BT:2402-2480MHz, WiFi:2412-2462MHz, 2402-2480MHz of BLE
Channel Number……:	BT: 79, WIFI: 11, BLE 40
Channel Separation……:	BT: 1MHz, WIFI: 5MHz, BLE: 2MHz
Modulation Type……:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type…….:	BT&2.4G Wi-Fi & BLE: PCB Antenna
Maximum Ant. Gain……:	BT&2.4G Wi-Fi & BLE: 3dBi

1.2 Facilities and Accreditations

1.2.1 Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until Sep.30, 2023.

A2LA Code: 5721.01

CCIC-SET is a third-party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.2.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C- 35°C
Relative Humidity (%):	25% -75%
Atmospheric Pressure (kPa):	86kPa-106kPa

1.2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Radiation Hazard Test:	Uc = 2.4 dB (k=2)

Test Equipment List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
Portable Spectrometer	Rohde & Schwarz	FSH8	A1140401672	2023.02.14	2024.02.13
Probe	Rohde & Schwarz	TSEMF-B1	A1140401671	2023.02.14	2024.02.13

1.3 Assessment Method:

According to KDB 447498 D01 General RF Exposure Guidance v06, FCC subpart §2.1091, subpart §1.1310, FCC/OST MP-5(1986) and OET Bulletin 56(1999).

1.4 Applicable Standard:

For RF (Wi-Fi & BT) Modular:
According to subpart §2.1091 and 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.
Limits for 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/f^2)	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.
Calculated Formulary:
Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e. g. mW/cm^2);
P = power input to the antenna (in appropriate units, e. g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data for RF Modular:

Mode	Frequency Range (MHz)	Antenna Gain		Target Output Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412~2462	3.0	2.00	24.50	281.84	20	0.1121	1.0
802.11g		3.0	2.00	24.00	251.19	20	0.0999	1.0
802.11 n-HT20		3.0	2.00	23.50	223.87	20	0.0891	1.0
802.11 n-HT40	2422~2452	3.0	2.00	22.00	158.49	20	0.0631	1.0
BLE	2402~2480	3.0	2.00	6.50	4.47	20	0.0018	1.0
BT	2402~2480	3.0	2.00	9.00	7.94	20	0.0032	1.0

Note: 1. The target output power was declared by the manufacturer.
2. Wi-Fi and Bluetooth cannot transmit simultaneously.

For microwave oven:

ISM equipment operating on higher frequencies (above 900 MHz), in particulars microwave ovens and medical diathermy equipment, radiation leakage should be measured in accordance with the current Bureau of Radiological Health standard, employing an electromagnetic radiation monitor. This test is made primarily to assure that personnel will not be exposed to radiation hazard in testing the equipment. Equipment submitted to the FCC which have radiation leakage apparently in excess of BRH limit will be reported to BRH for their evaluation. See FCC Bulletin OST 56, "Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Radiation".

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	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

NOTE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

A maximum of $1.0mW/cm^2$ is allowed in according with the applicable FCC standards

Test results:

Test location:	Test result (mW/cm^2)	Limit (mW/cm^2)	Verdict
Left side	0.18	1.0	Pass
Right side	0.19	1.0	Pass
Front	0.39	1.0	Pass
Rear	0.33	1.0	Pass

There was no microwave leakage exceeding a power level of 0.39 mW/cm2 Observed at any point 5cm or more from the external surface of the oven.

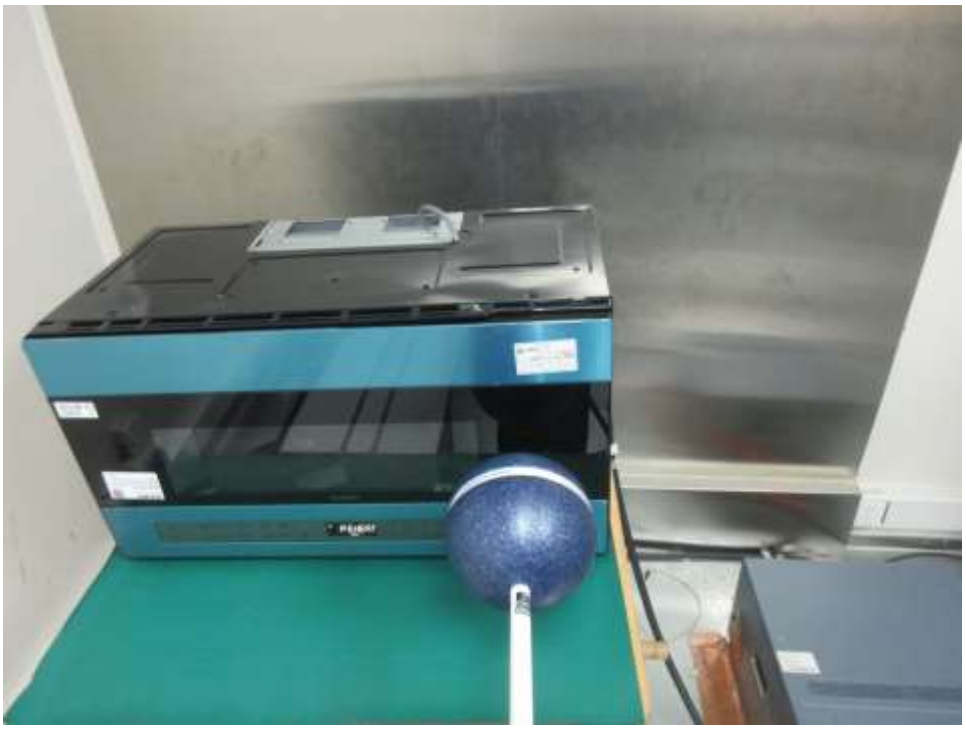
1.5 Conclusion:

RF Exposure for the product TM048K6SF-PH:

The worst-case RF exposure is 0.39+0.1121=0.5021 mW/cm^2 (<1 mW/cm^2).

The EUT meets exemption requirement- RF exposure evaluation greater than 20cm distance specified in § 2.1091.

1.6 Test setup photo



End of the report