

Technical Compliance Statement FCC Test Report

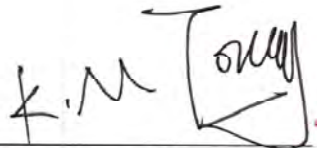
For the following information

Ref. File No.: C1W2312047

Product	:	Microwave Oven
Model Number	:	NN-SN77HS
Brand	:	Panasonic
Applicant	:	Panasonic Corporation of North America
Manufacturer	:	Panasonic Kitchen Appliances Technology (Jiaxing) Co., Ltd.
Rules and Standards	:	Title 47 FCC CFR, Part 18 FCC OST/MP-5 (1986)

We, **AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.** hereby certify that the above product has been tested by us and complied with the FCC official limits. The product might be marketed in US in accordance with the standard Title 47 CFR FCC Part 18 equipment regulations under FCC Rules. The test was performed according to the procedures mentioned in FCC OST/MP-5 (1986). The test data and results are issued on the test report no. ACWE-F2312021.

Signature



K.M Tong/ Assistant Manager

Date: 2024. 01. 05

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

TEST REPORT

Microwave Oven
Model Number: NN-SN77HS
Brand: Panasonic
FCC ID: ACLAPBP21

Applicant for:
Panasonic Corporation of North America
Two Riverfront Plaza, Newark New Jersey USA

Prepared by:
Audix Technology (Wujiang) Co., Ltd. EMC Dept.
No.1289 Jiangxing East Road, the Eastern Part of Wujiang Economic Development Zone
Jiangsu China 215200

File No. : C1W2312047
Report No. : ACWE-F2312021
Date of Report : 2024.01.05

The test report is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Test Report

Applicant : Panasonic Corporation of North America
Manufacturer : Panasonic Kitchen Appliances Technology (Jiaxing) Co., Ltd.
EUT Description
(A) Product : Microwave Oven
(B) Model Number : NN-SN77HS
(C) Brand : Panasonic
(D) Power Rating : 120V, 60Hz, 12.3A

Rules of Compliance and Applicable Standards:

Title 47 FCC CFR, Part 18
FCC OST/MP-5 (1986)

The device described above was tested by Audix Technology (Wujiang) Co., Ltd. EMC Dept. to determine the maximum emission levels emanating from the device. All of the tests were requested by the applicant and the results thereof based upon the information that the applicant provided to us. We, Audix Technology (Wujiang) Co., Ltd. assumes full responsibility for the accuracy and completeness of these measurements. This report is made under Title 47 FCC CFR, Part 18, and shows that the EUT is technically compliance with the FCC OST/MP-5 (1986) for FCC rule and described as above.

No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Audix Technology (Wujiang) Co., Ltd. EMC Dept.

Date of Test: 2023.12.26~2024.01.05 Date of Report: 2024.01.05

Reviewed by: Emma Hu
Emma Hu/ Assistant Administrator

Approved by: K.M Tong
K.M Tong/ Assistant Manager

Name of the Representative of the Responsible Party: _____

Signature: _____



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APPENDIX (Photos of EUT)

1. Revision of Test Report

Edition No.	Date of Revision	Revision Summary	Report Number
0	Jan.05, 2024	Original Report.	ACWE-F2312021

2. Summary of Test Result

2.1. Test Result

EMISSION		
Description of Test Item	Standard	Results
Power-line conducted emission	Title 47 FCC CFR, Part 18 FCC OST/MP-5 (1986)	PASS
		Margin 9.84dB at 20.938MHz
Radiated emissions (30 – 1000MHz)	Title 47 FCC CFR, Part 18 FCC OST/MP-5 (1986)	PASS
		Margin 24.52dB at 314.210MHz
Radiated emissions (Above 1GHz)	Title 47 FCC CFR, Part 18 FCC OST/MP-5 (1986)	PASS
		Margin 6.66dB at 7356.520MHz
Note :		
1. The uncertainty of our LAB-related test items is determined according to CISPR16-4-2 subclause 4.2, and the evaluation results are all ULAB<U _{cispr} , which is determined according to the Binary Statement for Simple Acceptance Rule (W=0).		
2. N/A is an abbreviation for Not Applicable.		
3. Special measures: None		
4. Decision and justification not to measure: None		

2.2. Description of Test Firm

Name of Test Firm	Audix Technology (Wujiang) Co., Ltd. EMC Dept. No1289 Jiangxing East Road, the Eastern Part of Wujiang Economic Development Zone Jiangsu China 215200 Tel: +86-512-63403993 Fax: +86-512-63403339 Contact e-mail: Reportfeedback@audix.com.cn
Accreditations	The laboratory is accredited by following organizations under ISO/IEC 17025:2017 (1) NVLAP(USA) NVLAP Lab Code 200786-0
Test Facilities	FCC OET Designation Number is : CN5026 (1) No.2 Conducted Shielding Enclosure (2) No.2 3m Semi-Anechoic Chamber

3. General Information

3.1. Description of Application

Applicant	Panasonic Corporation of North America Two Riverfront Plaza, Newark New Jersey USA
Manufacturer	Panasonic Kitchen Appliances Technology (Jiaxing) Co., Ltd. No.369 Chenggong Road, Economic and Technological Development Zone, Jiaxing, Zhejiang Province, China
Product	Microwave Oven
Brand	Panasonic
Model Number	NN-SN77HS

3.2. Description of the EUT

Test Model	NN-SN77HS
Serial Number	PP10001
Power Rating	120V, 60Hz, 12.3A
Firmware Version	N/A
Date of Receipt	2023.12.11
Date of Test	2023.12.26~2024.01.05
I/O Ports List	AC IN port*1
AC power cord(3C)	Unshielded, Undetachable

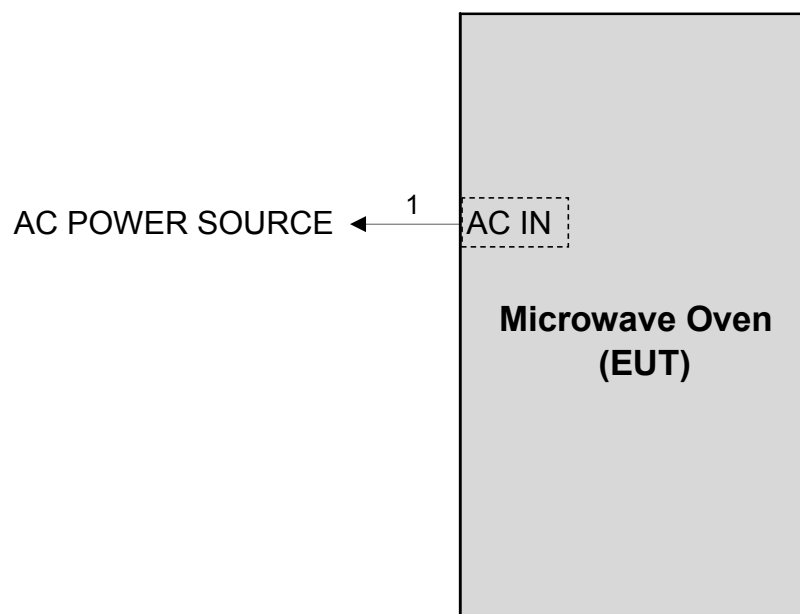
3.3. Highest Frequency within EUT

The highest frequency is 2450MHz.

4. Measurement Arrangement

4.1. Equipment and cables arrangement

- Connection Diagram of EUT and Peripheral Devices



(Out of Test Area)

Partner System
(None)

4.2. List of Used Cables under Test

Item	Type	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remark
1	AC Power Cord (3C)	1	1.1	No	0	Accessory of EUT

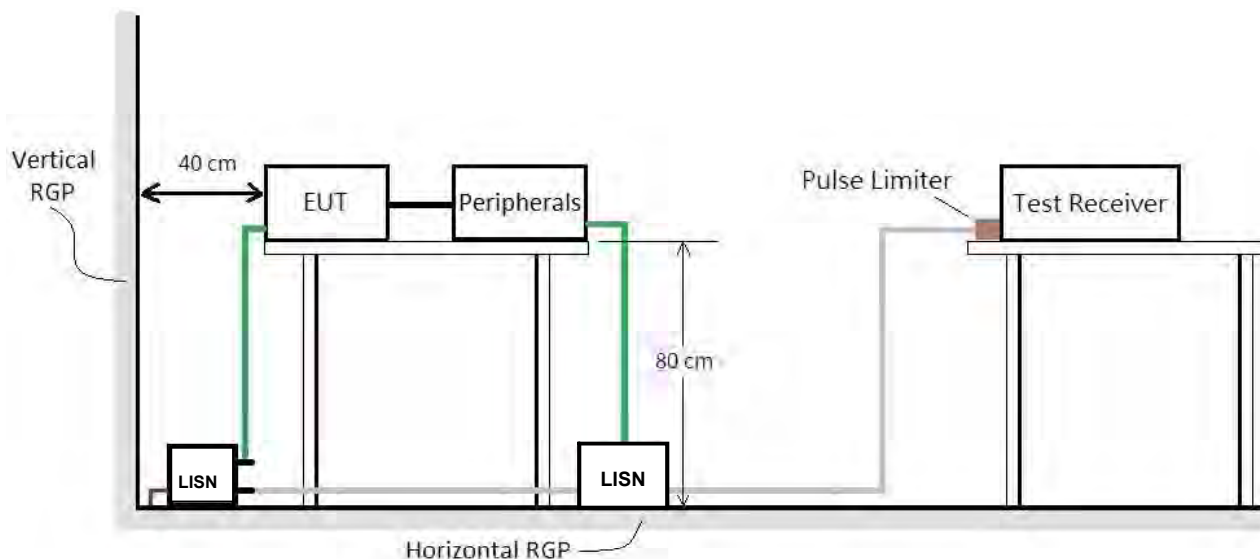
5. Measurement of Conducted Emissions

5.1. List of Test Instruments

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCI	100839	2023-03-25	2024-03-24
2.	L.I.S.N.	Schwarzbeck	NNLK 8129	8129-164	2023-12-13	2024-12-12
3.	L.I.S.N.	Kyoritsu	KNW-407	8-1793-4	2023-03-25	2024-03-24
4.	Pulse Limiter	R&S	ESH3-Z2	101832	2023-12-13	2024-12-12
5.	Switch	Anritsu	MP59B	6200547937	2023-12-13	2024-12-12
6.	50Ω Terminator	Tektronis	MS4630B	003-CON	2023-12-13	2024-12-12
7.	RF Cable	Shengxuan	ROS400	59/3	2023-12-13	2024-12-12
8.	Software	Audix /e3 (210616)				

5.2. Test Setup

The setup of EUT is according with MP-5: 1986 measurement procedure. Specification used was with the FCC part 18 limits.



5.3. 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

5.4. Measurement Procedure

- Setup the EUT and associated equipment described as section 4.1, and they were located 40cm from the vertical conducting plane.
- Connect the EUT power cord to the main A.M.N and associated equipment to the second A.M.N. All ports of the A.M.N not connecting to the measuring equipment was terminated into 50 ohm resistive load.
- Setup the resolution bandwidth of the test receiver at 9kHz (while testing within 0.15 to 30MHz).
- Operate the EUT system as described in section 4.2.
- Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, all of the interconnecting cables were manipulated.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of the EUT power cord with the peak detector by each of the EUT operation over the specified frequency range and record it.
- For final measurement, select the EUT operation mode that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it. All of the current-carrying conductors of each of the EUT power cords, except the ground conductor, must be measured over the specified frequency range.
- The measurement result was calculated by following formula:
Emission Level = Reading (Receiver) + Factor (A.M.N) + Cable Loss + Pulse Limiter
- If the average limit is met when using a Quasi-Peak detector receiver, the EUT is deemed to meet both limits and measurement with the average detector is unnecessary.

5.5. Measurement Result

The following data are the worst emissions based on the pre-scan measurement result.

Test Result Summary

According to the recorded data in following table, the EUT complied with the FCC PART18, the worst margin reading as below:

9.84dB at 20.938MHz in the Neutral conducted mode

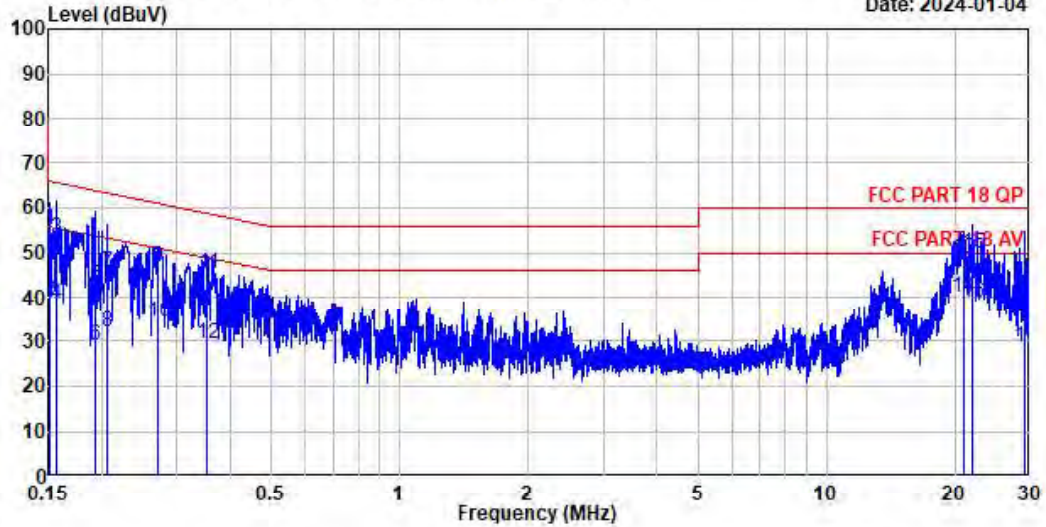
10.07dB at 20.404MHz in the Line conducted mode

Test Date: Jan.04, 2024 Temperature: 19.2℃ Humidity: 43%

Item	Test Condition	Reference Test Data No.	
		Neutral	Line
1	Max Power	# 1	# 2

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Date: 2024-01-04



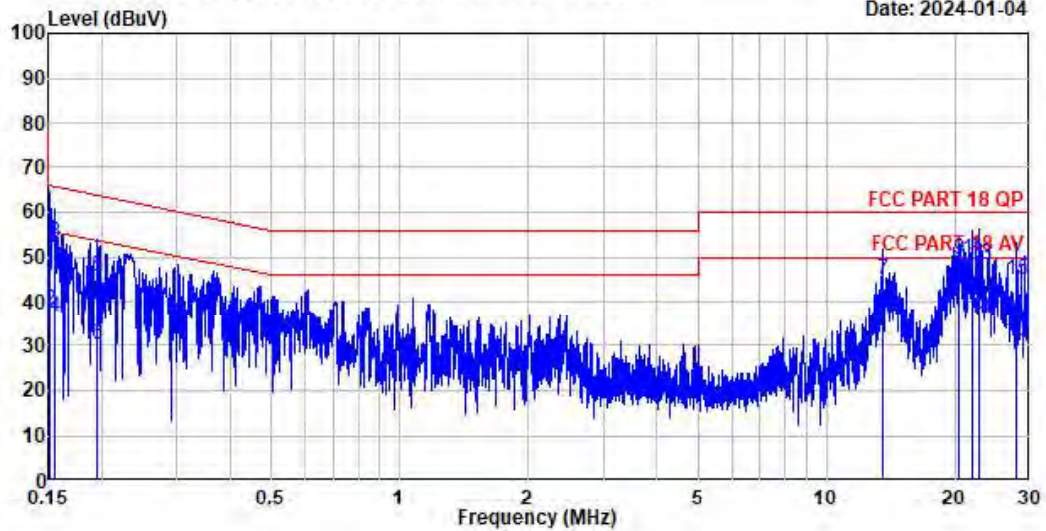
Site NO. : NO.2 shielded Room
 Instrument 1 : Receiver ESCI (839)
 Instrument 2 : NNLK 8129(164) 59/3 ESH3-Z2 (832)
 Dis. / Ant. : NNLK8129-2312
 Limit : FCC PART 18 QP
 Env. / Ins. : 19.2°C & 43 %
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :
 Ant. pol.: Neutral
 Data NO.:1
 Engineer : Zhaolin

Freq. MHz	LISN Factor dB	Cable Loss dB	Reading dBUV	Emission Level dBUV	Limits dBUV	Margin dB	Remark
0.151	0.10	10.03	45.11	55.24	65.92	10.68	QP
0.151	0.10	10.03	29.25	39.38	55.92	16.54	Average
0.157	0.10	10.03	42.96	53.09	65.63	12.54	QP
0.157	0.10	10.03	28.42	38.55	55.63	17.08	Average
0.193	0.10	10.03	32.42	42.55	63.89	21.34	QP
0.193	0.10	10.03	18.75	28.88	53.89	25.01	Average
0.206	0.10	10.03	35.58	45.71	63.35	17.64	QP
0.206	0.10	10.03	21.77	31.90	53.35	21.45	Average
0.272	0.10	10.03	36.47	46.60	61.05	14.45	QP
0.272	0.10	10.03	24.20	34.33	51.05	16.72	Average
0.354	0.10	10.03	34.97	45.10	58.87	13.77	QP
0.354	0.10	10.03	19.12	29.25	48.87	19.62	Average
20.938	0.72	10.21	37.63	48.56	60.00	11.44	QP
20.938	0.72	10.21	29.23	40.16	50.00	9.84	Average
22.004	0.74	10.21	38.77	49.72	60.00	10.28	QP
22.004	0.74	10.21	28.10	39.05	50.00	10.95	Average
29.216	0.88	10.27	32.41	43.56	60.00	16.44	QP
29.216	0.88	10.27	17.42	28.57	50.00	21.43	Average

Remarks: Emission Level = LISN factor + Cable loss (Cable + Pulse Att + Switch) + Reading

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Date: 2024-01-04



Site NO. : NO.2 shielded Room
 Instrument 1 : Receiver ESCI (839)
 Instrument 2 : NNLK 8129(164)59/3|ESH3-Z2 (832)
 Dis. / Ant. : NNLK8129-2312
 Limit : FCC PART 18 QP
 Env. / Ins. : 19.2°C & 43 %
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :

Ant. pol.: Line1

Data NO.:2

Engineer : Zhaolin

Freq. MHz	LISN Factor dB	Cable Loss dB	Reading dBuV	Emission Level dBuV	Limits dBuV	Margin dB	Remark
0.152	0.10	10.03	44.32	54.45	65.90	11.45	QP
0.152	0.10	10.03	28.16	38.29	55.90	17.61	Average
0.155	0.10	10.03	43.09	53.22	65.72	12.50	QP
0.155	0.10	10.03	26.52	36.65	55.72	19.07	Average
0.196	0.10	10.03	35.39	45.52	63.79	18.27	QP
0.196	0.10	10.03	20.12	30.25	53.79	23.54	Average
13.551	0.40	10.19	34.33	44.92	60.00	15.08	QP
13.551	0.40	10.19	26.21	36.80	50.00	13.20	Average
20.404	0.81	10.21	38.50	49.52	60.00	10.48	QP
20.404	0.81	10.21	28.91	39.93	50.00	10.07	Average
21.917	0.84	10.21	38.21	49.26	60.00	10.74	QP
21.917	0.84	10.21	26.48	37.53	50.00	12.47	Average
22.821	0.86	10.22	37.40	48.48	60.00	11.52	QP
22.821	0.86	10.22	25.13	36.21	50.00	13.79	Average
27.966	0.96	10.26	33.87	45.09	60.00	14.91	QP
27.966	0.96	10.26	19.70	30.92	50.00	19.08	Average

Remarks:Emission Level = LISN factor+Cable loss(Cable+Pulse Att+Switch)+Reading

6. Measurement of Radiated Hazard

6.1. List of Test Instruments

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	PXA signal analyzer	Agilent	N9030A	MY53120367	2023-07-12	2024-07-11
2.	Horn Antenna	ETS	3115	00062960	2023-05-29	2024-05-28
3.	Power Meter	Yokogawa test&Measurement Corporation	WT310E	C3XL12007E	2023-12-13	2024-12-12
4.	Thermometer	LUYUETING	923	N/A	2023-10-11	2024-10-10
5.	Field Probe + Field Meter	WAVECONTROL	WPF6 & SMP2	20WP060285 & 20SN1471	2023-10-11	2024-10-10

6.2. Applicable Standard

FCC §18.301 & FCC §18.305

6.3. Measurement Procedure

Radiation Hazard Measurement for microwave

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/cm² observed at any point 5 cm or more from the external surface of the oven.

A maximum of 1.0 mW/cm² 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.

Input Power

Input power and current was measured using a power analyzer. A 1250mL water load was placed in the center of the oven and the oven was operated at maximum output power. A 1250mL water load was chosen for its compatibility with the procedure commonly used by manufacturers to determine their input ratings.

Input Voltage (V _{AC} /Hz)	Input Current (Amps)	Measured Input Power (Watts)	Rated Input Power (Watts)	Mode
120/60	12.4	1456	1460	Microwave

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

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: 1250 milliliters of water in the beaker located in the center of the oven.
- Load for frequency measurement: 1250 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 875 and the other of 375 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.

The RF output power is rated at 1250 watts

Load used for power output measurement = 1250 milliliters of water

Load used for frequency measurement = 1250 milliliters of water

Load used for harmonic measurement = 875 & 375 milliliters of water

Load used for other measurement = 875 milliliters of water

RF Output Power Measurement

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 of $10\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ is used for the test. The water temperature is measured immediately before it is poured into the container.

A quantity of $1250\text{ g} \pm 5\text{ g}$ 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 $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ is measured. The oven is then switched off and the final water temperature is measured within 60 s.

m_w (g)	m_c (g)	T_0 ($^{\circ}\text{C}$)	T_1 ($^{\circ}\text{C}$)	T_2 ($^{\circ}\text{C}$)	t (s)
1250	450	16.0	10.8	20.7	45

$$\text{RF Output Power} = (4.187 \times 1250 \times (20.7 - 10.8) + 0.55 \times 450 \times (20.7 - 16)) / 45 = 1177.3 \text{ Watts}$$

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-B, the measured out-of-band emissions were compared to the limit of $25\mu\text{V}/\text{meter}$ 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-B, the measured out-of-band emissions were compared with the limit calculated as following:

$$\text{LFS} = 25 \times \text{SQRT} (\text{Power Output} / 500)$$

$$\text{LFS} = 25 \times \text{SQRT} (1177.3 / 500) \text{ LFS}$$

$$= \underline{38.36}$$

Where: LFS is the maximum allowable field strength for out-of-band emissions in $\mu\text{V}/\text{meter}$ at a 300-meter measurement distance. Power Output is the measured output power in watts.

LFS $\mu\text{V}/\text{m}@300\text{m}$	$\text{dB}\mu\text{V}/\text{m}@300\text{m}$	$\text{dB}\mu\text{V}/\text{m}@3\text{m}$
38.36	31.7	71.7

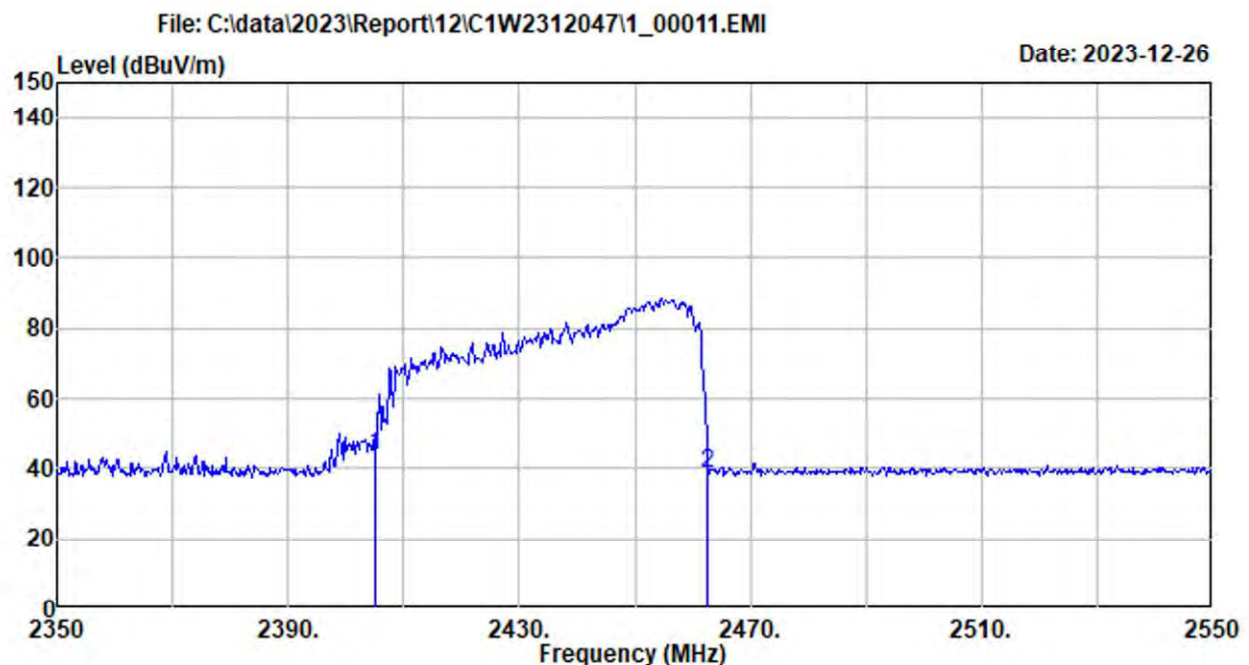
Note: Limit ($\text{dB}\mu\text{V}/\text{m}@3$) = Limit ($\text{dB}\mu\text{V}/\text{m}@300\text{m}$) + 40(dB)

6.4. Measurement Result

Variation in Operating Frequency with Time

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1250mL 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.

Low Frequency (MHz)	High Frequency (MHz)
2405.000	2462.600

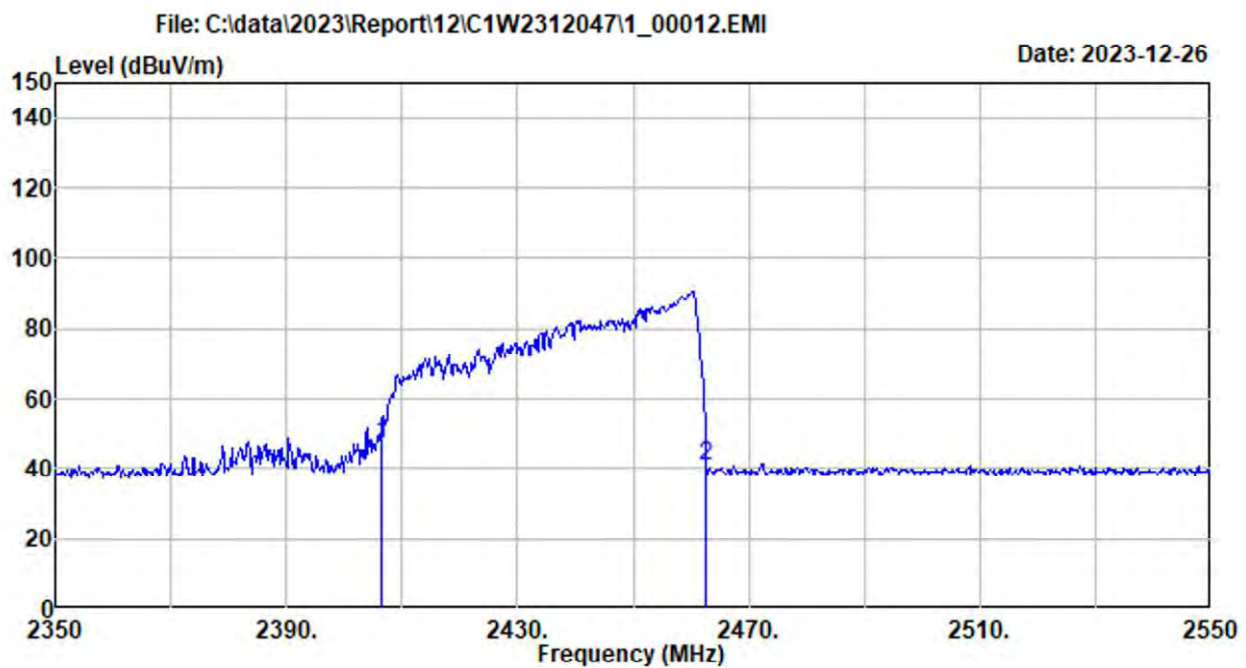


Variation in Operating Frequency with Line Voltage

The EUT was operated / warmed by at least 10 minutes of use with a 1250mL 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.

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

Low Frequency (MHz)	High Frequency (MHz)
2406.400	2462.600



7. Measurement of Radiated Emissions

7.1. List of Test Instruments

- For measurement of 30 to 1000MHz frequency range
(At No.2 3m Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESR7	101956	2023-03-25	2024-03-24
2.	Pre-Amplifier	Agilent	8447D	2944A10922	2023-03-25	2024-03-24
3.	Bi-log Antenna	SCHWARZBEC K	VULB 9168	706	2023-03-12	2024-03-11
4.	RF Cable	Chengyi +Shengxuan	NM500+RO S400	190945+6000+3 000	2023-07-12	2024-07-11
5.	Software	Audix /e3 (210616)				

- For measurement of above 1GHz frequency range
(At No.2 3m Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	PXA signal analyzer	Agilent	N9030A	MY53120367	2023-07-12	2024-07-11
2.	PXA signal analyzer	Agilent	N9030A	MY53120217	2023-03-25	2024-03-24
3.	Microwave Amplifier	Agilent	8449B	3008A02232	2023-03-25	2024-03-24
4.	Preamplifier (18~40G)	Chengyi	EMC184045SE	980556	2023-12-13	2024-12-12
5.	Horn Antenna	ETS	3117	00218586	2023-03-13	2024-03-12
6.	Horn Antenna	ETS	3116	62641	2023-05-29	2024-05-28
7.	RF Cable(1~18G)	Chengyi	EMC104-SF-SM- 8000/NM-1000	190938+ 190942	2023-07-11	2024-07-10
8.	RF Cable(18~40G)	Huber+ Shuner	SUCOFLEX 102	800978/2+ 800977/2	2023-12-13	2024-12-12
9.	Software	Audix /e3 (210616)				

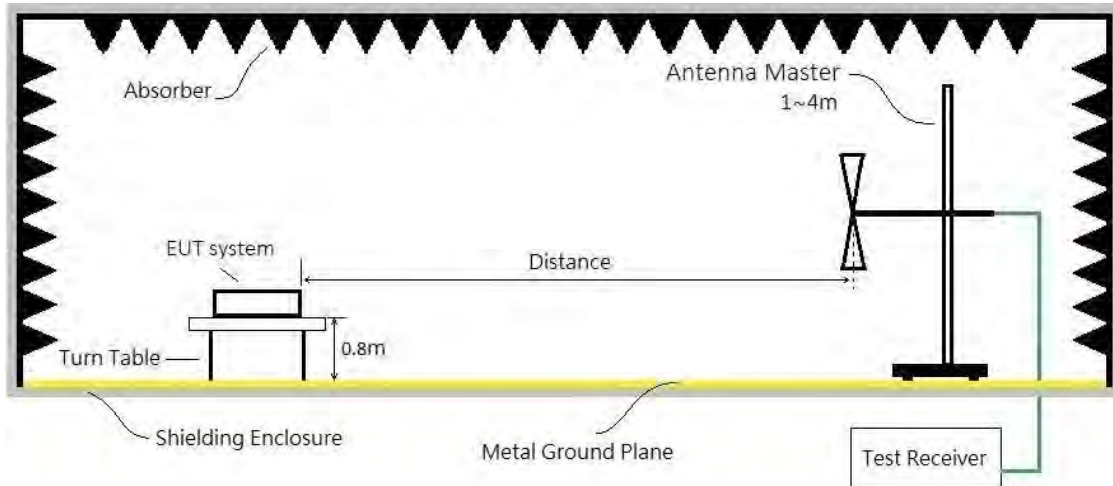
7.2. Applicable Standard

FCC §18.305, §18.309

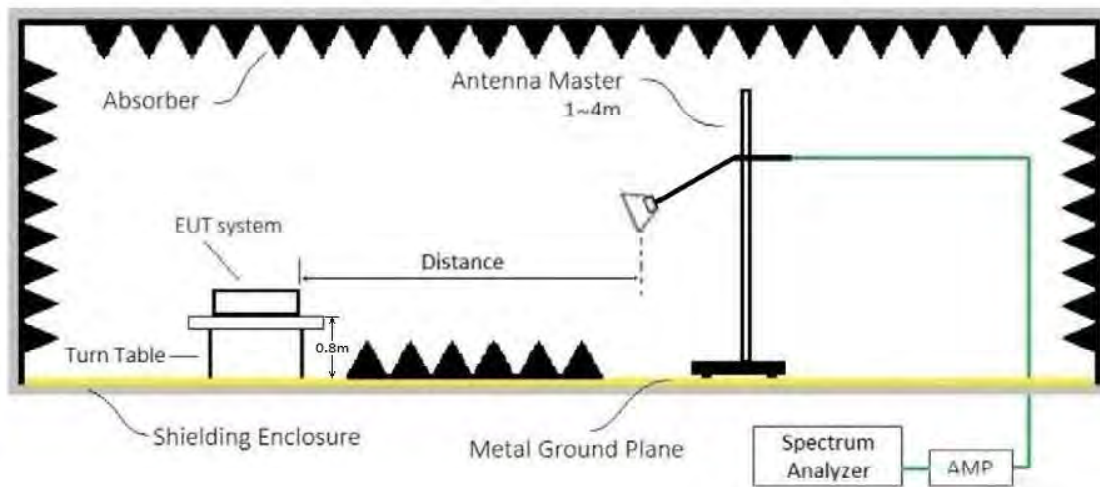
7.3. Test Setup

The radiated emission tests 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.

- For frequency range 30 to 1000MHz (at Semi-Anechoic Chamber)



- For frequency range above 1GHz (at Semi-Anechoic Chamber)



7.4. EMI Test Receiver Setup

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

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

7.5. Measurement Procedure

- The EUT and peripherals were placed on the rotatable non-conduction table, which is 0.8meters above the ground reference plane at the semi-anechoic chamber or OATS as described in section 4.1 and 6.2.
- The measurement distance is set as specified in section 6.3. The specified distance is between the horizontal projection onto the ground plane of the closest periphery of the EUT and the projection onto the ground plane of the center of the axis of the elements of the receiving antenna.
- The resolution bandwidth of the test receiver was at 120kHz (testing from 30 to 1000MHz) or 1MHz (testing above 1000MHz).
- Operate the EUT system as described in section 4.2.
- For the exploratory measurement, determine the highest emission amplitude relative to the limit on each of antenna polarization with the peak detector by each of the EUT operations over the specified frequency range and record it.
- For final measurement, select the EUT operation mode that produced the highest amplitude in the exploratory measurement to determine the highest emissions with each specified detector and record it.
- In order to determine the maximum emission level, must rotate the table in 360 degree and move the receiving antenna between 1~4m height above the ground reference plane.
- In order to find the maximum emission, all of the interconnecting cables were manipulated, except for the bundled cable.
- Both polarizations of receiving antenna were determined.
- The measurement result was calculated by following formulas:

(30 – 1000MHz)

$$\text{Emission Level (dB } \mu\text{V/m)} = \text{Reading (Spectrum) (dB } \mu\text{V)} + \text{Antenna Factor (dB/m)} - \text{Preamp Gain (dB)} + \text{Cable Loss (dB)}$$

(Above 1GHz)

$$\text{Emission Level (dB } \mu\text{V/m)} = \text{Reading (Spectrum) (dB } \mu\text{V)} + \text{Antenna Factor (dB/m)} - \text{Preamp Gain (dB)} + \text{Cable Loss (dB)}$$

- The 3dB bandwidth of the horn antenna is minimum 22 degree (or $w=1.17\text{m}$ at 3m distance) for 1~18 GHz.
- The 3dB bandwidth of the horn antenna is minimum 14 degree (or $w=0.73\text{m}$ at 3m distance) for 1~18 GHz.

7.6. Measurement Result

Test Result Summary

According to the recorded data in following table, the EUT complied with the FCC PART18, the worst margin reading as below:

24.52dB at 314.210MHz in the Horizontal polarization, 30MHz-1GHz

6.66dB at 7356.520MHz in the Vertical polarization, 1-25GHz

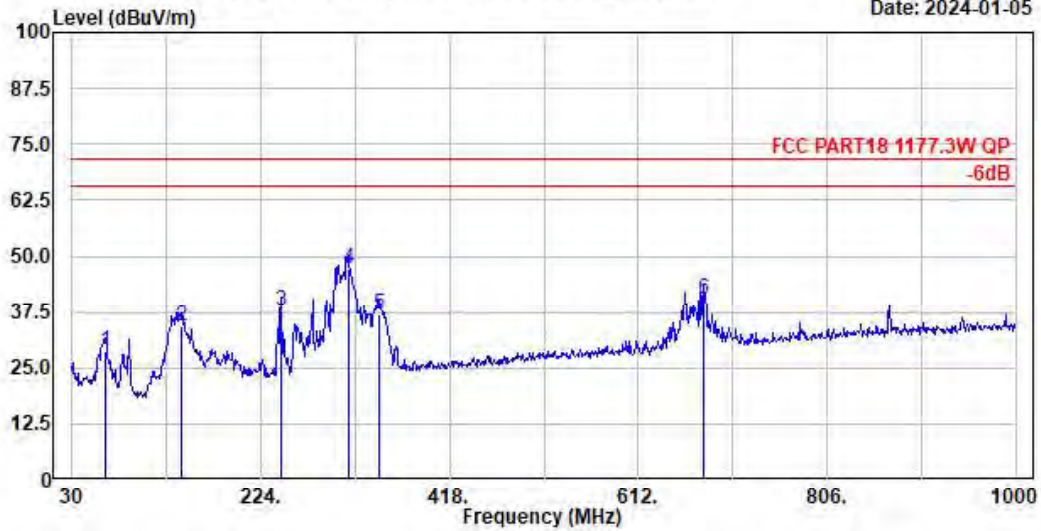
- For frequency range 30 – 1000MHz

Test Date: Jan.05, 2024 Temperature: 22℃ Humidity: 51%

Item	Test Condition	Reference Test Data No.	
		Horizontal	Vertical
1	Max Power	# 9	# 10

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00009.EMI

Date: 2024-01-05



Site NO. : NO.2 3M Chamber
Instrument 1 : Receiver ESR7 (956)
Instrument 2 : Preamplifier 8447D(922)|400
Dis. / Ant. : 9168-706-2304-3M
Limit : FCC PART18 1177.3W QP
Env. / Ins. : 22°C/51%
EUT : Microwave Oven
M/N : NN-SN77HS
Power Rating : 120Vac/60Hz
Test Mode : Max Power
Memo :

Ant. pol.: Horizontal Data NO.:9

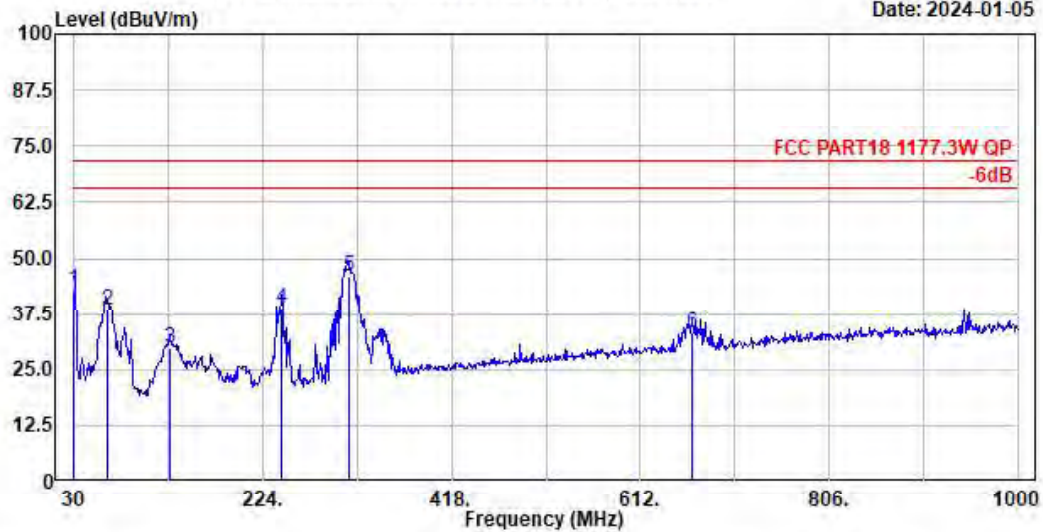
Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
64.920	18.46	0.43	37.49	27.74	28.64	71.70	43.06	QP
142.520	18.95	0.65	42.33	27.48	34.45	71.70	37.25	QP
244.370	17.61	0.90	46.29	27.17	37.63	71.70	34.07	QP
314.210	19.61	1.06	53.69	27.18	47.18	71.70	24.52	QP
345.250	20.30	1.12	43.08	27.38	37.12	71.70	34.58	QP
679.900	26.62	1.63	40.49	28.53	40.21	71.70	31.49	QP

Remarks: Emission Level = Antenna factor + Cable loss + Reading - Preamp Factor

File: E:\TEST DATA\2023\Report\12\1W2312047\1_00010.EMI

Date: 2024-01-05



Site NO. : NO.2 3M Chamber
Instrument 1 : Receiver ESR7 (956)
Instrument 2 : Preamplifier 8447D(922)|400
Dis. / Ant. : 9168-706-2304-3M
Limit : FCC PART18 1177.3W QP
Env. / Ins. : 22°C/51%
EUT : Microwave Oven
M/N : NN-SN77HS
Power Rating : 120Vac/60Hz
Test Mode : Max Power
Memo :
Ant. pol.: Vertical Data NO.:10
Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBUV	Preamp Factor dB	Emission Level dBUV/m	Limits dBUV/m	Margin dB	Remark
30.150	18.51	0.27	52.03	27.85	42.96	71.70	28.74	QP
64.290	18.56	0.43	47.23	27.74	38.48	71.70	33.22	QP
127.970	17.52	0.61	39.10	27.54	29.69	71.70	42.01	QP
243.400	17.58	0.89	47.46	27.18	38.75	71.70	32.95	QP
312.270	19.57	1.05	52.67	27.16	46.13	71.70	25.57	QP
665.350	26.41	1.62	33.85	28.51	33.37	71.70	38.33	QP

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

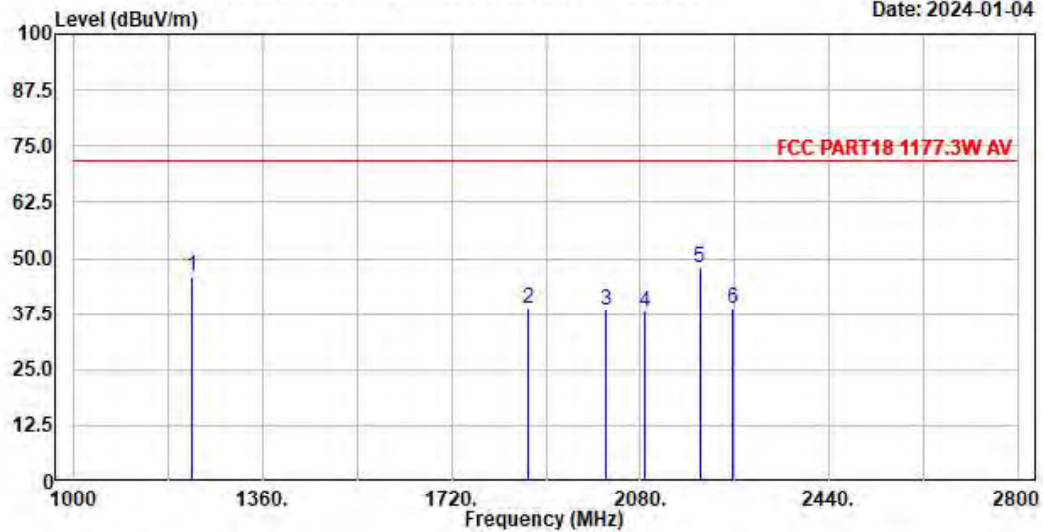
- For frequency range 1 – 2.8GHz

Test Date: Jan.04, 2024 Temperature: 22℃ Humidity: 51%

Item	Test Condition	Reference Test Data No.	
		Horizontal	Vertical
1	Max Power	# 4	# 3

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00004.EMI

Date: 2024-01-04



Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(217)
Instrument 2 : Preamplifier 8449B(234)000
Dis. / Ant. : 3117-586-2304
Limit : FCC PART18 1177.3W AV
Env. / Ins. : 22°C/51%
EUT : Microwave Oven
M/N : NN-SN77HS
Power Rating : 120Vac/60Hz
Test Mode : Max Power
Memo :

Ant. pol.: Horizontal Data NO.:4

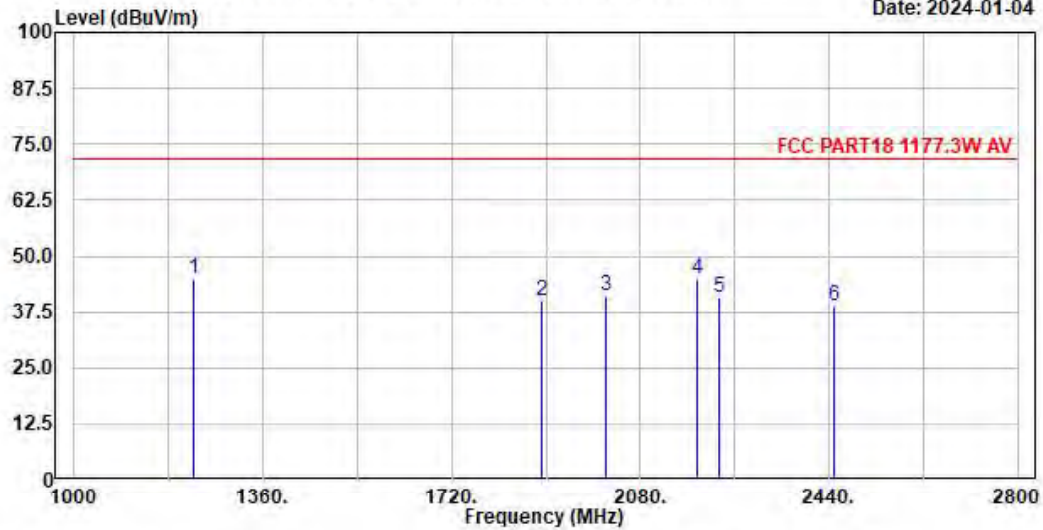
Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
1224.680	28.70	2.04	48.32	33.04	46.02	71.70	25.68	Average
1865.940	30.75	2.58	38.25	32.59	38.99	71.70	32.71	Average
2014.540	31.91	2.72	36.53	32.50	38.66	71.70	33.04	Average
2087.040	31.95	2.80	35.72	32.47	38.00	71.70	33.70	Average
2193.240	32.02	2.90	45.62	32.44	48.10	71.70	23.60	Average
2255.185	32.05	2.97	36.32	32.42	38.92	71.70	32.78	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00003.EMI

Date: 2024-01-04



Site NO. : NO.2 3M Chamber
Instrument 1 : Spectrum N9030A(217)
Instrument 2 : Preamplifier 8449B(234)|000
Dis. / Ant. : 3117-586-2304
Limit : FCC PART18 1177.3W AV
Env. / Ins. : 22°C/51%
EUT : Microwave Oven
M/N : NN-SN77HS
Power Rating : 120Vac/60Hz
Test Mode : Max Power
Memo :

Ant. pol.: Vertical Data NO.:3

Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
1227.350	28.69	2.04	47.19	33.04	44.88	71.70	26.82	Average
1891.720	30.97	2.60	38.95	32.58	39.94	71.70	31.76	Average
2013.050	31.91	2.72	39.19	32.50	41.32	71.70	30.38	Average
2187.140	32.01	2.90	42.31	32.44	44.78	71.70	26.92	Average
2230.359	32.04	2.94	38.07	32.43	40.62	71.70	31.08	Average
2448.128	32.17	3.16	35.95	32.37	38.91	71.70	32.79	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

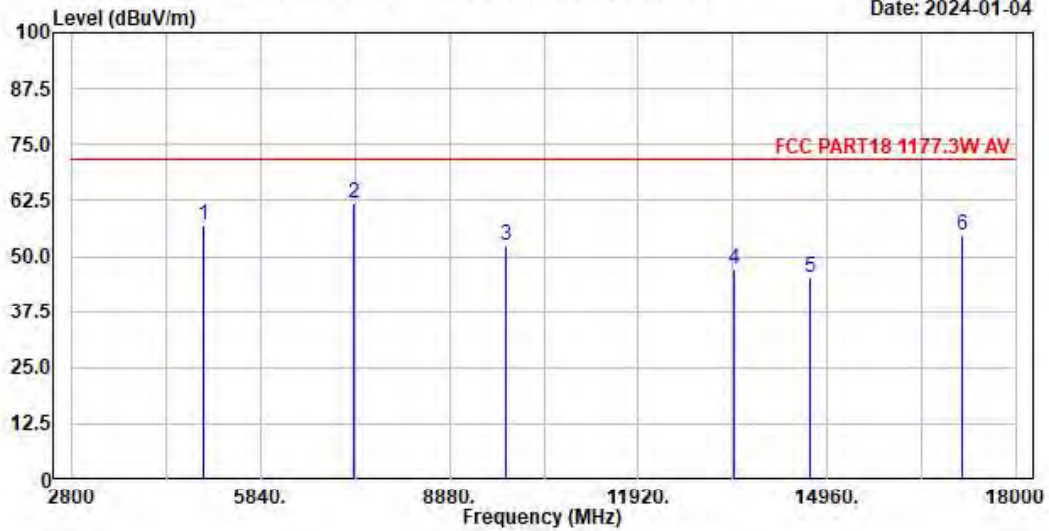
- For frequency range 2.8 – 18GHz

Test Date: Jan.04, 2024 Temperature: 22℃ Humidity: 51%

Item	Test Condition	Reference Test Data No.	
		Horizontal	Vertical
1	Max Power	# 5	# 6

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00005.EMI

Date: 2024-01-04



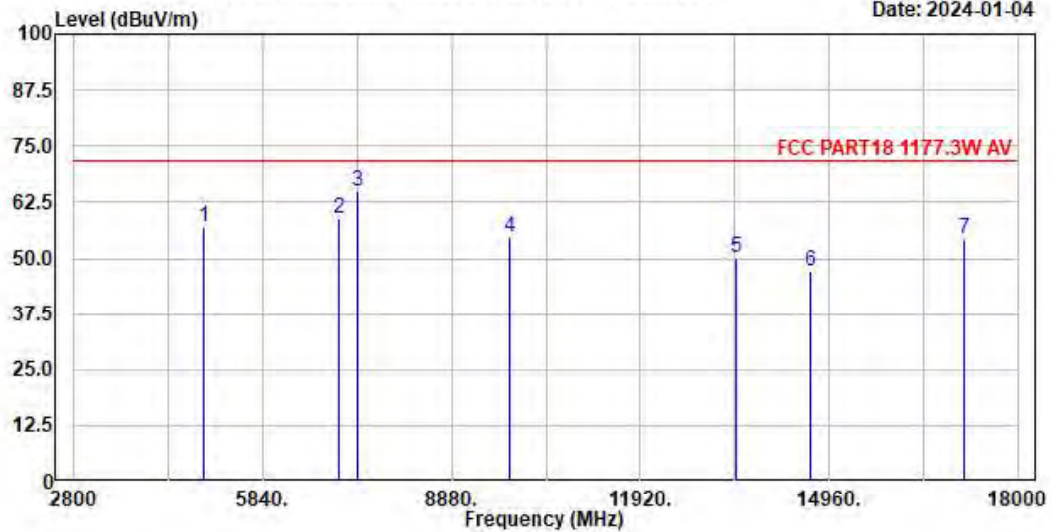
Site NO. : NO.2 3M Chamber
 Instrument 1 : Spectrum N9030A(217)
 Instrument 2 : Preamplifier 8449B(234)|000
 Dis. / Ant. : 3117-586-2304
 Limit : FCC PART18 1177.3W AV
 Env. / Ins. : 22°C/51%
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :
 Ant. pol.: Horizontal Data NO.:5
 Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
4906.400	33.96	4.40	50.33	31.78	56.91	71.70	14.79	Average
7341.200	35.60	5.88	52.17	31.63	62.02	71.70	9.68	Average
9783.050	36.84	6.58	40.99	32.01	52.40	71.70	19.30	Average
13450.550	38.73	7.46	32.35	31.42	47.12	71.70	24.58	Average
14681.800	39.45	7.77	30.06	31.90	45.38	71.70	26.32	Average
17122.500	41.73	8.56	35.32	30.92	54.69	71.70	17.01	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00006.EMI

Date: 2024-01-04



Site NO. : NO.2 3M Chamber
 Instrument 1 : Spectrum N9030A(217)
 Instrument 2 : Preamplifier 8449B(234)|000
 Dis. / Ant. : 3117-586-2304
 Limit : FCC PART18 1177.3W AV
 Env. / Ins. : 22°C/51%
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :

Ant. pol.: Vertical Data NO.:6

Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBUV	Preamp Factor dB	Emission Level dBUV/m	Limits dBUV/m	Margin dB	Remark
4891.590	33.96	4.39	50.47	31.78	57.04	71.70	14.66	Average
7062.300	35.60	5.80	49.17	31.61	58.96	71.70	12.74	Average
7356.520	35.60	5.89	55.19	31.64	65.04	71.70	6.66	Average
9805.440	36.87	6.60	43.10	32.00	54.57	71.70	17.13	Average
13454.370	38.73	7.46	35.29	31.42	50.06	71.70	21.64	Average
14669.700	39.44	7.77	31.91	31.87	47.25	71.70	24.45	Average
17126.900	41.72	8.56	35.13	30.93	54.48	71.70	17.22	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

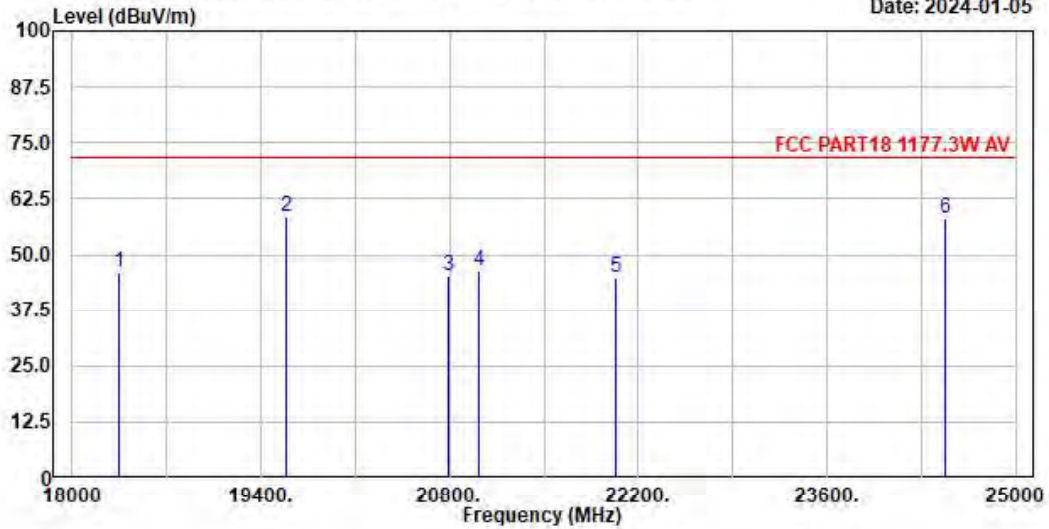
- For frequency range 18 – 25GHz

Test Date: Jan.05, 2024 Temperature: 22℃ Humidity: 51%

Item	Test Condition	Reference Test Data No.	
		Horizontal	Vertical
1	Max Power	# 8	# 7

File: E:\TEST DATA\2023\Report\12\C1W2312047\1_00008.EMI

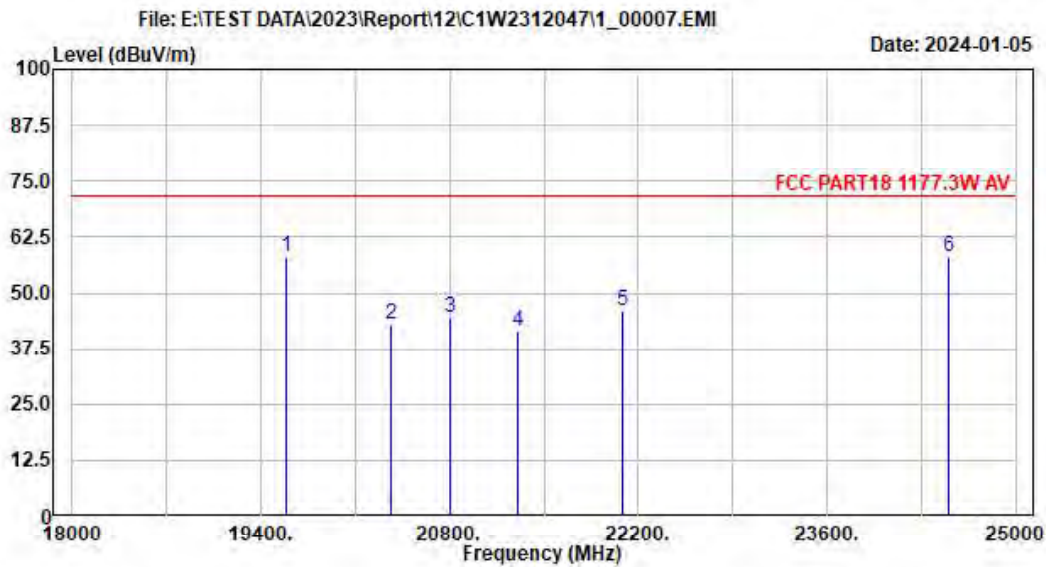
Date: 2024-01-05



Site NO. : NO.2 3M Chamber
 Instrument 1 : Spectrum N9030A(217)
 Instrument 2 : Preamplifier EMC184045SE(556)|7/2
 Dis. / Ant. : 3116-641-2307
 Limit : FCC PART18 1177.3W AV
 Env. / Ins. : 22°C/51%
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :
 Ant. pol.: Horizontal Data NO.:8
 Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
18345.200	44.25	9.15	44.06	51.37	46.09	71.70	25.61	Average
19590.300	45.30	9.56	55.30	51.85	58.31	71.70	13.39	Average
20795.350	45.50	9.77	42.19	52.10	45.36	71.70	26.34	Average
21014.350	45.70	9.79	43.00	52.11	46.38	71.70	25.32	Average
22028.640	45.40	10.12	42.06	52.60	44.98	71.70	26.72	Average
24472.350	45.39	10.73	54.31	52.34	58.09	71.70	13.61	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor



Site NO. : NO.2 3M Chamber
 Instrument 1 : Spectrum N9030A(217)
 Instrument 2 : Preamplifier EMC184045SE(556)|7/2
 Dis. / Ant. : 3116-641-2307
 Limit : FCC PART18 1177.3W AV
 Env. / Ins. : 22°C/51%
 EUT : Microwave Oven
 M/N : NN-SN77HS
 Power Rating : 120Vac/60Hz
 Test Mode : Max Power
 Memo :
 Ant. pol.: Vertical Data NO.:7
 Engineer : Zhouweihan

Freq. MHz	Ant. Factor dB/m	Cable Loss dB	Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limits dBuV/m	Margin dB	Remark
19584.650	45.30	9.55	55.01	51.05	58.01	71.70	13.69	Average
20369.600	45.23	9.73	40.18	52.10	43.04	71.70	28.66	Average
20800.050	45.50	9.77	41.38	52.10	44.55	71.70	27.15	Average
21308.900	45.64	9.89	38.08	52.25	41.36	71.70	30.34	Average
22084.500	45.40	10.13	43.12	52.61	46.04	71.70	25.66	Average
24502.650	45.40	10.74	54.21	52.35	58.00	71.70	13.70	Average

Remarks:Emission Level = Antenna factor+Cable loss+Reading-Preamp Factor

8. Measurement Uncertainty List

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2.

The uncertainties value is not used in determining the PASS/FAIL results.

Test Item	Range Frequency	Uncertainty
No.2 Conducted Shielding Enclosure		
Conducted Disturbance Measurement	0.15MHz ~ 30MHz	± 3.06dB
At 3m Semi-Anechoic Chamber		
Radiated Disturbance Measurement (Distance 3m)	30MHz ~ 1GHz	± 4.80dB
	1GHz ~ 6GHz	± 4.60dB
	6GHz ~ 18GHz	± 4.52dB
	18GHz ~ 40GHz	± 4.12dB

Remark: Uncertainty = $ku_c(y)$

The standards listed in this report only require the uncertainty to be listed, and the measurement uncertainty is not required to be calculated in the measurement results. Therefore, the conformity judgment results are in accordance with the quality document TMC-205, and the test results in this report meet the requirements of the standards listed in this report.