



FCC EMC Test Report

FCC ID: ACLAPCW91

Project No. : 2410H001
Equipment : Microwave Oven
Brand Name : Panasonic
Test Model : NN-CV88QS
Series Model : NN-CV87QS
Applicant : Panasonic Corporation of North America
Two Riverfront Plaza, Newark New Jersey USA
Address : Two Riverfront Plaza, Newark New Jersey USA
Manufacturer : Panasonic Kitchen Appliances Technology (Jiaxing) Co.,Ltd
Address : No.369 Chenggong Road, Economic and Technological Development
Zone, Jiaxing, Zhejiang Province, China
Factory : Panasonic Kitchen Appliances Technology (Jiaxing) Co.,Ltd
Address : No.369 Chenggong Road, Economic and Technological Development
Zone, Jiaxing, Zhejiang Province, China
Date of Receipt : Oct. 08, 2024
Date of Test : Oct. 08, 2024 ~ Oct. 12, 2024
Issued Date : Nov. 15, 2024
Report Version : R00
Test Sample : Engineering Sample No.: SH2024100832
Standard(s) : FCC Part 18 (using FCC MP-5:1986)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Shanghai)

Devo.wang

Prepared by : Devo Wang

Simon.Jia

Approved by : Simon Jia

Add: No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

Tel: +86-021-61765666

Web: www.newbtl.com

Service mail: btl_qa@newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL. The report must not be used by the client to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

Table of Contents	Page
REPORT ISSUED HISTORY	5
1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACILITY	7
1.2 MEASUREMENT UNCERTAINTY	7
1.3 TEST ENVIRONMENT CONDITIONS	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
2.2 DESCRIPTION OF TEST MODES	9
2.3 EUT OPERATING CONDITIONS	10
2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	10
2.5 DESCRIPTION OF SUPPORT UNITS	11
3. EMC EMISSION TEST	12
3.1 AC POWER LINE CONDUCTED EMISSIONS TEST	12
3.1.1 LIMIT	12
3.1.2 MEASUREMENT INSTRUMENTS LIST	13
3.1.3 TEST PROCEDURE	13
3.1.4 DEVIATION FROM TEST STANDARD	13
3.1.5 TEST SETUP	14
3.1.6 TEST RESULTS	14
3.2 RADIATION HAZARD MEASUREMENT	19
3.2.1 MEASUREMENT INSTRUMENTS LIST	19
3.2.2 RADIATION HAZARD MEASUREMENT FOR MICROWAVE	19
3.2.3 INPUT POWER	20
3.2.4 LOAD FOR MICROWAVE OVENS	20
3.2.5 POWER OUTPUT MEASUREMENT FOR MICROWAVE OVENS	21
3.2.6 BROIL-RADIATION TUBE POWER MEASUREMENT	22
3.2.7 OPERATING FREQUENCY MEASUREMENT	23
3.3 RADIATED EMISSIONS	25
3.3.1 LIMITS	25
3.3.2 MEASUREMENT INSTRUMENTS LIST	27
3.3.3 TEST PROCEDURE	28
3.3.4 DEVIATION FROM TEST STANDARD	28
3.3.5 TEST SETUP	29
3.3.6 TEST RESULTS-30 MHZ to 1 GHZ	30
3.3.7 TEST RESULTS- Above 1 GHZ	35
4. EUT TEST PHOTO	42
APPENDIX	46

Table of Contents**Page**

DECLARATION LETTER

67

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCE-1-2410H001	R00	Original Report.	Nov. 15, 2024	Valid

1. SUMMARY OF TEST RESULTS

Emission		
Ref Standard(s)	Test Item	Result
FCC/OST MP-5 (1986)	AC Power Line Conducted Emissions	PASS
	Radiation hazard measurement	PASS
	Radiated emission between 30MHz and 1000MHz	PASS
	Radiated emission Above 1 GHz	PASS

NOTE:

(1) "N/A" denotes test is not applicable to this device.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.

BTL's Test Firm Registration Number for FCC: 964234

BTL's Designation Number for FCC: CN1374

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$))

The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-C01	CISPR 16-4-2	150 kHz ~ 30 MHz	2.02

B. Radiation hazard measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR 16-4-2	1GHz ~ 6GHz	4.70

C. Radiated emissions test:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB08 (10m)	CISPR 16-4-2	30MHz ~ 200MHz	V	4.28
		30MHz ~ 200MHz	H	4.12
		200MHz ~ 1,000MHz	V	3.74
		200MHz ~ 1,000MHz	H	4.00

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01 (3m)	CISPR 16-4-2	1GHz ~ 6GHz	4.70
		6GHz ~ 18GHz	4.42
		18 ~ 26.5 GHz	3.22

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Tested By
AC Power Line Conducted Emissions	24°C	49%	Toby Xiong
Radiation hazard measurement	25°C	51%	Grunt Fan
Radiated emission between 30MHz and 1000MHz	22°C	51%	Don Tang
Radiated emission Above 1 GHz	22.6°C~24°C	45%~52%	Toby Xiong Rex Ren

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Microwave Oven
Brand Name	Panasonic
Test Model	NN-CV88QS
Series Model	NN-CV87QS
Model Difference(s)	Only the accessories are different
Rate Voltage	AC 120V
Power Rating	1110W (Microwave) / 1350W (Broil/HEATER)
Connecting I/O Port(s)	1*AC Port
Highest Internal Frequency(Fx)	2450 MHz

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Microwave Max Power (BT+WIFI Link)
Mode 2	Broil Max Power (BT+WIFI Link)

Radiation hazard measurement	
Final Test Mode	Description
Mode 1	Microwave Max Power (BT+WIFI Link)

AC Power Line Conducted Emissions test	
Final Test Mode	Description
Mode 1	Microwave Max Power (BT+WIFI Link)
Mode 2	Broil Max Power (BT+WIFI Link)

Radiated Emission between 30MHz and 1000MHz	
Final Test Mode	Description
Mode 1	Microwave Max Power (BT+WIFI Link)
Mode 2	Broil Max Power (BT+WIFI Link)

Radiated Emission Above 1 GHz	
Final Test Mode	Description
Mode 1	Microwave Max Power (BT+WIFI Link)

2.3 EUT OPERATING CONDITIONS

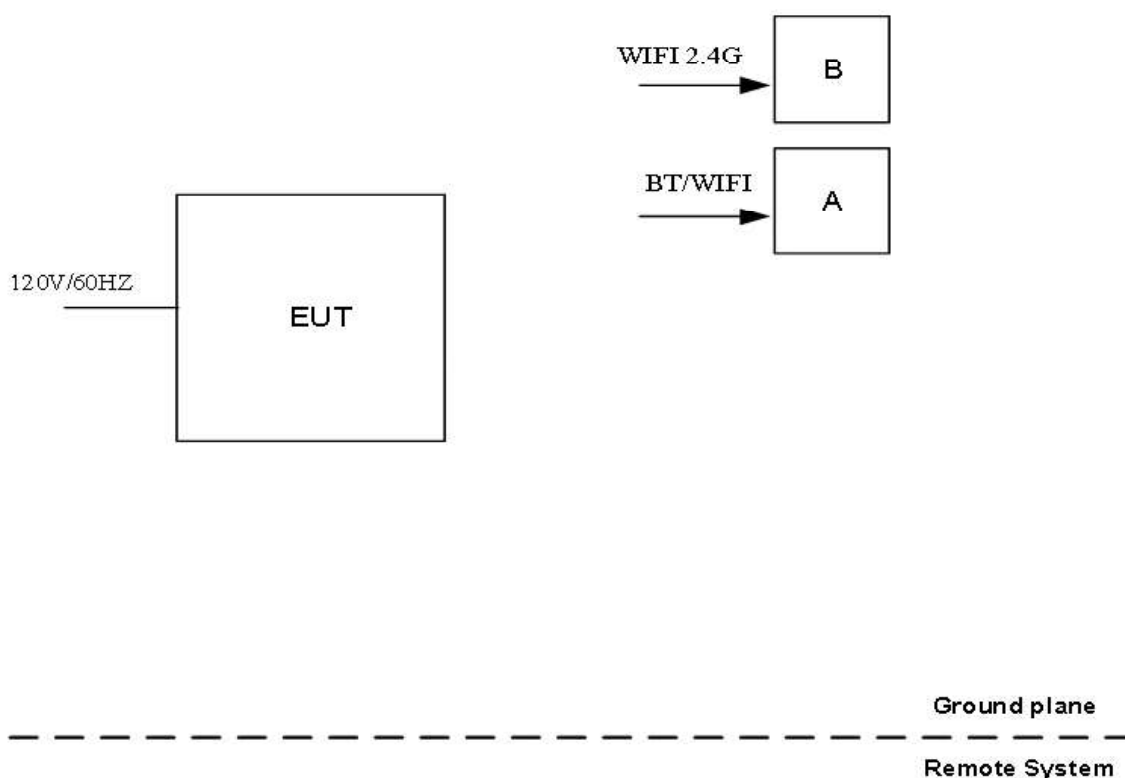
The smart phone (A) is configured with the EUT through the Bluetooth signal, so that the EUT is connected to the WIFI network signal (B), so that the terminal (A) can achieve data interaction with the EUT through the network signal.

Evaluate the following patterns for testing in a typical way (typically used by typical users).

Mode 1: Microwave Max Power (BT+WIFI Link)

Mode 2: Broil Max Power (BT+WIFI Link)

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

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.	Series No.
A	Mobile phone	Xiao mi	MDE5	N/A
B	N750 Wireless Dual Band Gigabit Router	NETGEAR	WNDR4300V2	3XB15A5V00EF3

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1.10m

3. EMC EMISSION TEST

3.1 AC POWER LINE CONDUCTED EMISSIONS TEST

3.1.1 LIMIT

Frequency of Emission (MHz)	(dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5.0	56.00	46.00
5.0 - 30.0	60.00	50.00

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.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value - Limit Value

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101340	Jul. 12, 2025
2	Test Cable	emci	EMCRG400-B M-NM-10000	N/A	Mar. 09, 2025
3	EMI Test Receiver	R&S	ESR3	100082	Dec. 22, 2024
4	50Ω coaxial switch	Anritsu	MP59B	6201750902	Feb. 2, 2025
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

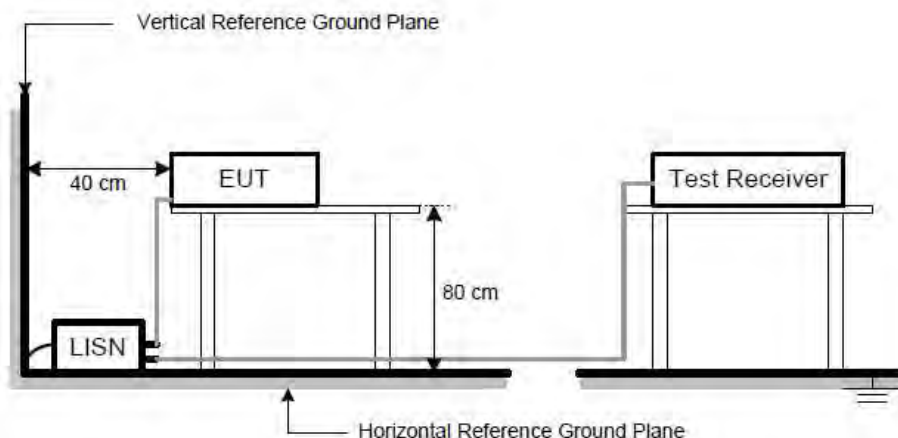
3.1.3 TEST PROCEDURE

- 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 equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.
- Measuring frequency range from 150KHz to 30MHz,IF B/W:9 kHz

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 TEST RESULTS

Remark

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9 kHz; SPA setting in RBW=10 kHz, VBW =10 kHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=10 kHz, VBW=10 kHz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

Test Result Summary:

Accordings to the recorded date in following table, the EUT complied with the FCC PART18, the worst Over limit reading as below:

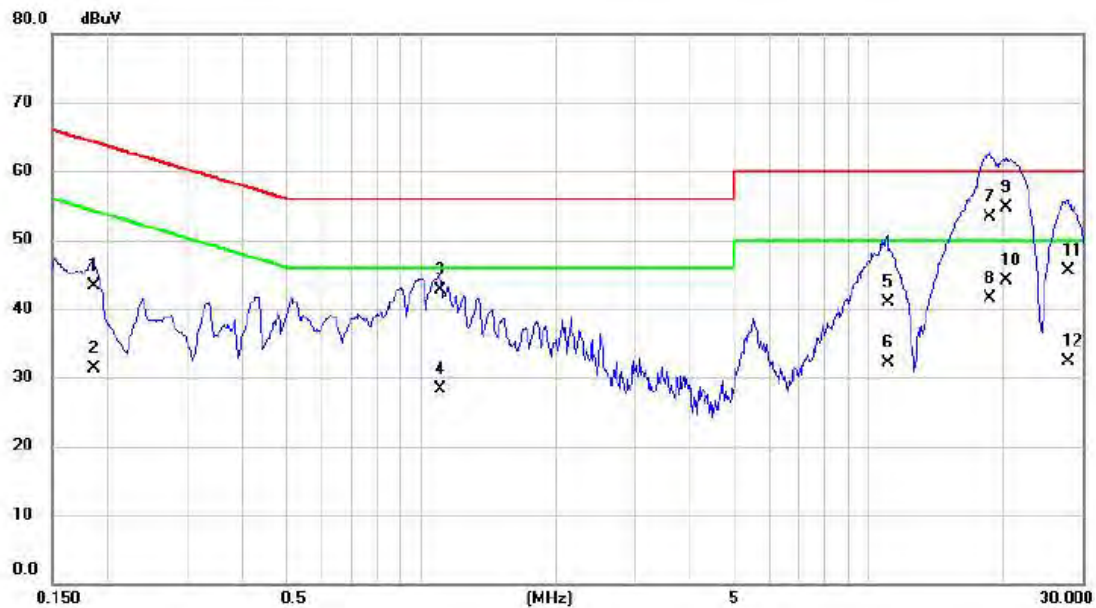
Mode1: Microwave Max Power (BT+WIFI Link)

-5.34 dB at 20.2605 MHz in the Line conducted mode
-6.07 dB at 19.806 MHz in the Neutral conducted mode

Mode2: Broil Max Power (BT+WIFI Link)

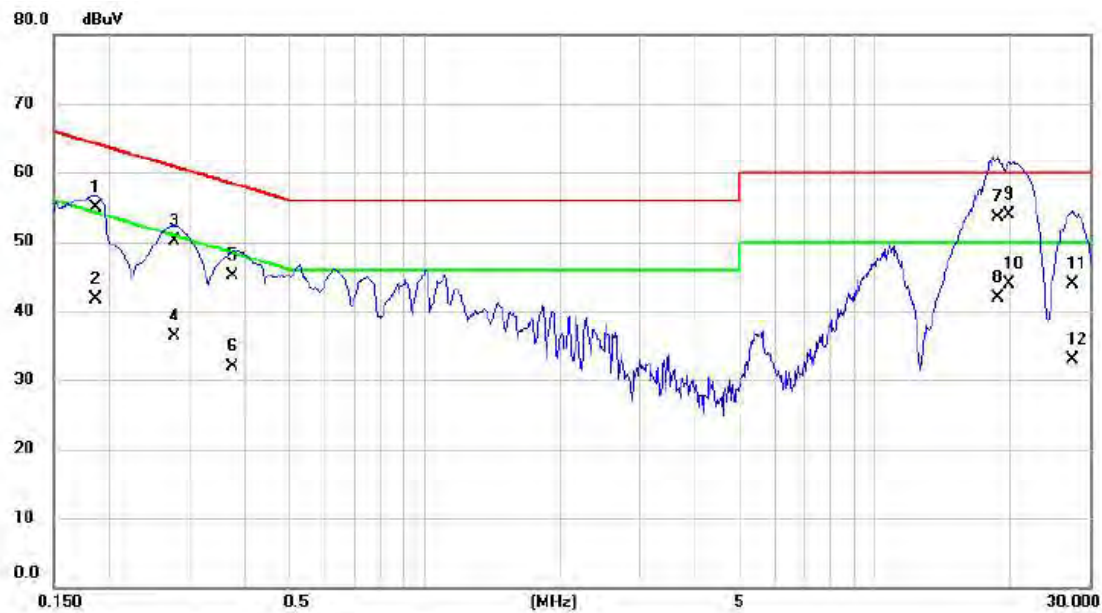
-25.53 dB at 19.3268 MHz in the Line conducted mode
-22.24 dB at 19.0748 MHz in the Neutral conducted mode

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 1		



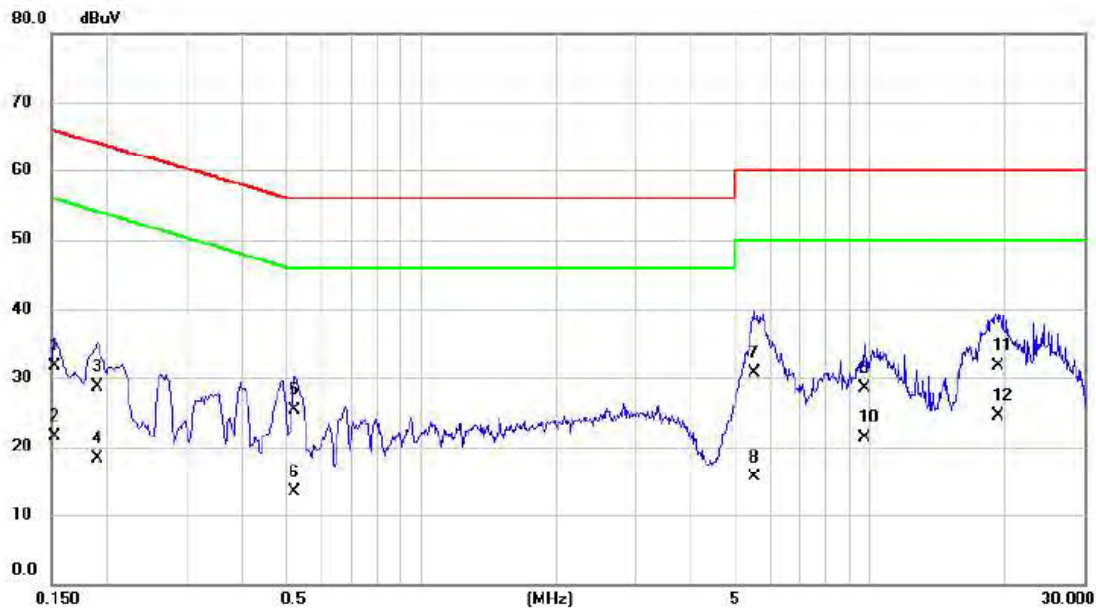
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over limit dB	Detector	Comment
1		0.1860	43.20	0.04	43.24	64.21	-20.97	QP	
2		0.1860	31.20	0.04	31.24	54.21	-22.97	AVG	
3		1.1062	42.60	0.15	42.75	56.00	-13.25	QP	
4		1.1062	28.20	0.15	28.35	46.00	-17.65	AVG	
5		11.0175	40.60	0.26	40.86	60.00	-19.14	QP	
6		11.0175	31.80	0.26	32.06	50.00	-17.94	AVG	
7		18.6000	53.20	0.18	53.38	60.00	-6.62	QP	
8		18.6000	41.30	0.18	41.48	50.00	-8.52	AVG	
9	*	20.2605	54.50	0.16	54.66	60.00	-5.34	QP	
10		20.2605	43.90	0.16	44.06	50.00	-5.94	AVG	
11		27.8745	45.10	0.46	45.56	60.00	-14.44	QP	
12		27.8745	31.90	0.46	32.36	50.00	-17.64	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 1		



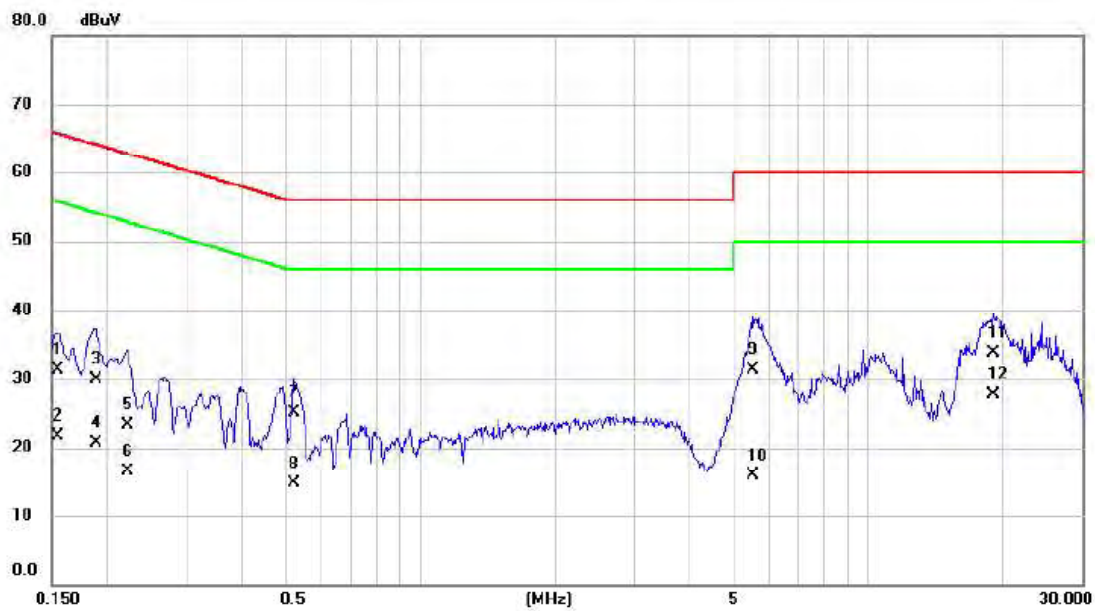
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over limit		
		MHz	Level	Factor	ment				
			dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1860	54.80	0.05	54.85	64.21	-9.36	QP	
2		0.1860	41.70	0.05	41.75	54.21	-12.46	AVG	
3		0.2782	50.10	0.10	50.20	60.87	-10.67	QP	
4		0.2782	36.20	0.10	36.30	50.87	-14.57	AVG	
5		0.3750	45.00	0.11	45.11	58.39	-13.28	QP	
6		0.3750	31.80	0.11	31.91	48.39	-16.48	AVG	
7		18.8160	53.39	0.15	53.54	60.00	-6.46	QP	
8		18.8160	41.79	0.15	41.94	50.00	-8.06	AVG	
9		19.8060	53.70	0.13	53.83	60.00	-6.17	QP	
10	*	19.8060	43.80	0.13	43.93	50.00	-6.07	AVG	
11		27.4155	43.60	0.39	43.99	60.00	-16.01	QP	
12		27.4155	32.50	0.39	32.89	50.00	-17.11	AVG	

Test Voltage	AC 120V/60Hz	Phase	Line
Test Mode	Mode 2		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over limit dB	Detector	Comment
1		0.1522	21.90	9.73	31.63	65.88	-34.25	QP	
2		0.1522	11.80	9.73	21.53	55.88	-34.35	AVG	
3		0.1905	18.80	9.81	28.61	64.01	-35.40	QP	
4		0.1905	8.40	9.81	18.21	54.01	-35.80	AVG	
5		0.5235	15.40	9.86	25.26	56.00	-30.74	QP	
6		0.5235	3.50	9.86	13.36	46.00	-32.64	AVG	
7		5.5343	20.70	10.08	30.78	60.00	-29.22	QP	
8		5.5343	5.40	10.08	15.48	50.00	-34.52	AVG	
9		9.7260	18.30	10.23	28.53	60.00	-31.47	QP	
10		9.7260	11.00	10.23	21.23	50.00	-28.77	AVG	
11		19.3268	21.10	10.67	31.77	60.00	-28.23	QP	
12	*	19.3268	13.80	10.67	24.47	50.00	-25.53	AVG	

Test Voltage	AC 120V/60Hz	Phase	Neutral
Test Mode	Mode 2		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over limit dB	Detector	Comment
1		0.1545	21.50	9.78	31.28	65.75	-34.47	QP	
2		0.1545	11.90	9.78	21.68	55.75	-34.07	AVG	
3		0.1883	20.00	9.81	29.81	64.11	-34.30	QP	
4		0.1883	10.90	9.81	20.71	54.11	-33.40	AVG	
5		0.2220	13.50	9.83	23.33	62.74	-39.41	QP	
6		0.2220	6.70	9.83	16.53	52.74	-36.21	AVG	
7		0.5235	15.20	9.83	25.03	56.00	-30.97	QP	
8		0.5235	4.80	9.83	14.63	46.00	-31.37	AVG	
9		5.5388	21.20	10.11	31.31	60.00	-28.69	QP	
10		5.5388	5.70	10.11	15.81	50.00	-34.19	AVG	
11		19.0748	23.00	10.76	33.76	60.00	-26.24	QP	
12	*	19.0748	17.00	10.76	27.76	50.00	-22.24	AVG	

3.2 RADIATION HAZARD MEASUREMENT

3.2.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	206960	Mar. 12, 2025
2	Test Cable	RW	RWLP50-4.0A-SMSM-7M	20200824-001	Jul. 27, 2025
3	Test Cable	emci	EMC-104HS-SM-SM-3500	240626	Jul. 27, 2025
4	MXE EMI Receiver	Keysight	N9038A	MY57290116	Jul. 12, 2025
5	Dynamometer	HIOKI	PW3198	160527667	Mar. 02, 2025
6	Thermometer	SS	TP101	N/A	Jan. 03, 2025
7	Microwave leakage tester	ETS	HI-1710A	S81-042-DA	Jan. 01, 2025

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

3.2.2 RADIATION HAZARD MEASUREMENT FOR MICROWAVE

Test Procedure	<p>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</p> <p>A 275ml 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</p>
Results	<p>There was no microwave leakage exceeding a power level of <u>0.41</u> mW/cm² observed at any point 5cm or more from the external surface of the oven.</p> <p>A maximum of 1.0 mW/cm² is allowed in accordance with the applicable FCC standards. Hence, microwave leakage in the as-received condition with the oven door closed was below the maximum allowed.</p>

3.2.3 INPUT POWER

Input power and current was measured. A 1000mL 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.

Input Voltage (V/Hz)	Input Current (A)	Measured Input Power (W)	Rated Input Power (W)	Operation Mode
120V / 60Hz	9.5	1159	1110	Microwave
120V / 60Hz	11.4	1315	1350	Broil

* Based on the measured input power, the EUT was found to operate within the expected specifications.

3.2.4 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.

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

According to the above content and product power, the water load is 1000 milliliters.

Load used for power output measurement = 1000 milliliters of water

Load used for frequency measurement = 1000 milliliters of water

Load used for harmonic measurement = 700 & 300 milliliters of water

Load used for other measurement = 700 milliliters of water

3.2.5 POWER OUTPUT MEASUREMENT FOR MICROWAVE OVENS

The power output is measured by the calorimetric method, using the load specified in FCC MP-5 Section 4.1, computing the power output from the observed temperature rise of the load over a period of time. The measured value of power output is used to determine the allowable out-of-band field strength under the terms specified in Section 18.305 of the Rules.

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 beginning of the test, the ambient temperature is recorded,
The temperature of the water is measured immediately before pouring into the container, and the initial temperature of the test water is $10^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

Add $1000\text{g} \pm 5\text{g}$ of water to the container to get its actual mass. The container was then immediately placed in the center of the microwave heating area, heated at maximum power until the water temperature reached $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$, and the heating time was recorded.

m_w (g)	m_c (g)	T_0 ($^{\circ}\text{C}$)	T_1 ($^{\circ}\text{C}$)	T_2 ($^{\circ}\text{C}$)	t (s)
1000	450	23.5	10.2	20.4	40

RF Output Power = $(4.187 \times 1000 \times (20.4 - 10.2) + 0.55 \times 450 \times (20.4 - 23.5)) / 40 = \underline{1048.5 \text{ Watts}}$

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 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:

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

Field Strength = $25 \times \text{SQRT} (1048.5 / 500)$

Field Strength = 36.2 $\mu\text{V/m}$

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

LFS $\mu\text{V/m@300m}$	$\text{dB}\mu\text{V/m@300m}$	$\text{dB}\mu\text{V/m@3m}$	$\text{dB}\mu\text{V/m@10m}$
36.2	31.17	71.17	60.71

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

3.2.6 BROIL-RADIATION TUBE POWER MEASUREMENT

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:

$$\text{LFS} = 15 \times \text{SQRT} (\text{Power Output}/500)$$

$$\text{LFS} = 15 \times \text{SQRT} (\underline{1300} / 500)$$

$$\text{LFS} = \underline{24.18}$$

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 $\mu\text{V}/\text{m}@300\text{m}$	$\text{dB}\mu\text{V}/\text{m}@300\text{m}$	$\text{dB}\mu\text{V}/\text{m}@10\text{m}$
24.18	27.67	57.21

Note.: (1) Limit ($\text{dB } \mu\text{V}/\text{m}@10\text{m}$) = Limit ($\text{dB } \mu\text{V}/\text{m}@300\text{m}$) + $20\log (300\text{m}/10\text{m})$

(2) Only applicable to non-ISM system frequencies (**See Section 3.3.1**) .

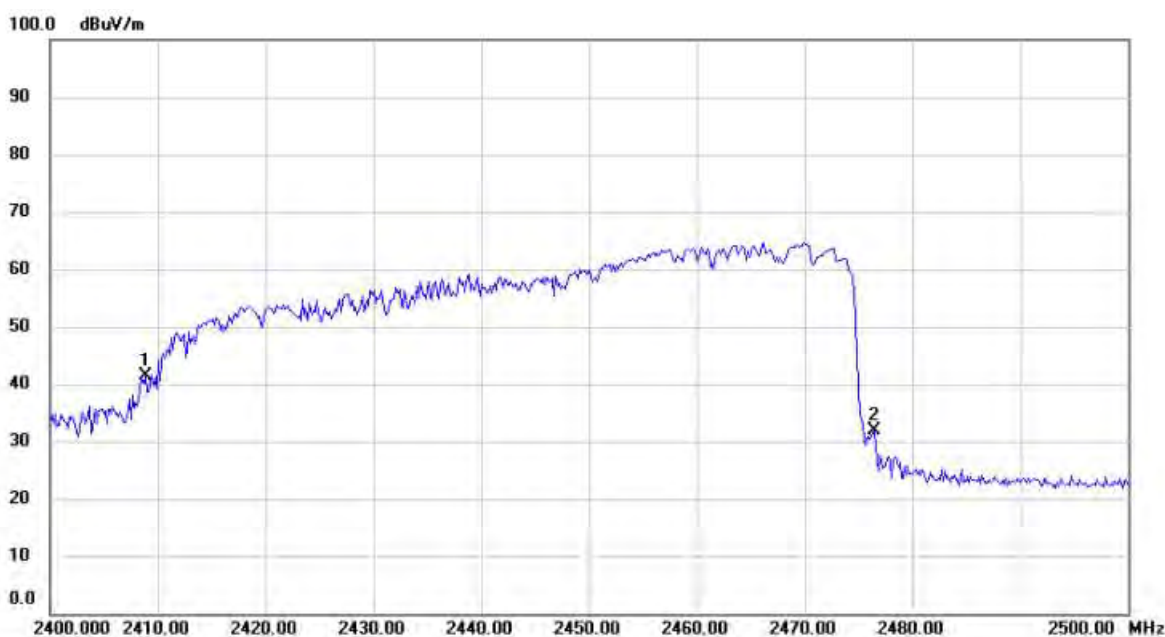
3.2.7 OPERATING FREQUENCY MEASUREMENT

The Variation of frequency with time

The operating frequency was measured using a spectrum analyzer, starting with EUT at room temperature, a 1000ml water load was located in the center of the oven, set a spectrum analyzer with antenna at 3 meters distance from the oven and 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.

The results of this test are as follows:

Low Frequency (MHz)	High Frequency (MHz)
2408.859	2476.426



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	*	2408.859	54.43	-13.16	41.27			peak	
2		2476.426	44.95	-12.98	31.97			peak	

The variation of frequency with Line Voltage

The operating frequency was measured using a spectrum analyzer. The EUT was operated/ warmed by at least 10 minutes 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.

The results of this test are as follows:

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

Low Frequency (MHz)	High Frequency (MHz)
2404.850	2481.000



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	*	2404.850	48.91	-13.17	35.74			peak	
2		2481.000	47.94	-12.97	34.97			peak	

3.3 RADIATED EMISSIONS

3.3.1 LIMITS

Operating frequency	Field Strength (uV/m)	Measurement Distance (meters)	F.S Limitation at 3or10m Distance
			(dBuV/m)
Any ISM	25*SQRT (Power Output/500)	300	71.17 at 3m
			60.71 at 10m
Any non ISM	15*SQRT (Power Output/500)	300	57.21 at 10m

NOTE:

- (1) Operation of ISM equipment within the following safety, search and rescue frequency bands is prohibited: 490–510 kHz, 2170–2194 kHz, 8354–8374 kHz, 121.4–121.6 MHz, 156.7–156.9 MHz, and 242.8–243.2 MHz.
- (2) Emission level (dBuV/m) = 20log Emission level (uV/m);
3or10m Emission level (dBuV/m) = 300m Emission level +20log(300m/3or10m).
- (3)The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Required highest frequency for radiated measurement

Frequency band in which device operates (MHz)	Range of frequency measurements	
	Lowest frequency	Highest frequency
Below 1.705	Lowest frequency generated in the device, but not lower than 9 kHz	30 MHz
1.705 to 30	Lowest frequency generated in the device, but not lower than 9 kHz	400 MHz
30 to 500	Lowest frequency generated in the device or 25 MHz, whichever is lower	Tenth harmonic or 1,000 MHz, whichever is higher.
500 to 1,000	Lowest frequency generated in the device or 100 MHz, whichever is lower	Tenth harmonic
Above 1,000do	Tenth harmonic or highest detectable emission.

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	Detector Type
30MHz-1000 MHz	120khz	300khz	120khz	QP
Above 1 GHz	1MHz	3MHz	/	Peak
	1MHz	10Hz	1MHz	AVG

3.3.2 MEASUREMENT INSTRUMENTS LIST

Radiated emission up to 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	787	Mar. 12, 2025
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	788	Mar. 12, 2025
3	Pre-Amplifier	emci	EMC9135	980412	Feb. 2, 2025
4	Pre-Amplifier	emci	EMC9135	980413	Feb. 2, 2025
5	EXA Spectrum Analyzer	Keysight	N9010A	MY56480561	Feb. 2, 2025
6	MXE EMI Receiver	Keysight	N9038A	MY57150106	Feb. 2, 2025
7	Test Cable	emci	EMCCFD400-NM-NM-6000	170641	Mar. 9, 2025
8	Test Cable	emci	EMCCFD400-NM-NM-10000	170642	Mar. 9, 2025
9	Test Cable	emci	EMC104-SM-NM-2500	170645	Mar. 9, 2025
10	Test Cable	emci	EMC104-SM-SM-800	170333	Mar. 9, 2025
11	Test Cable	emci	EMCCFD400-NM-NM-6000	170639	May 31, 2025
12	Test Cable	emci	DLZJ-NM-NM-HA800-6M-6G	GD24022121	May 31, 2025
13	Test Cable	emci	EMCCFD400-NM-NM-6000	170640	Mar. 9, 2025
14	Test Cable	emci	EMC104-SM-NM-2500	170644	May 31, 2025
15	Test Cable	emci	EMC104-SM-SM-800	170334	May 31, 2025

Radiated emission above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	206960	Mar. 12, 2025
2	Pre-Amplifier	emci	EMC012645B	980264	Jul. 12, 2025
3	MXE EMI Receiver	Keysight	N9038A	MY57290116	Jul. 12, 2025
4	Test Cable	RW	RWLP50-4.0A-SMS M-7M	20200824-001	Jul. 27, 2025
5	Test Cable	emci	EMC-104HS-SM-S M-3500	240626	Jul. 27, 2025
6	Test Cable	emci	EMC-104HS-SM-S M-1000	240625	Jul. 27, 2025
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1	N/A	N/A
8	Antenna	Schwarzbeck	BBHA9170	9170-651	Mar. 15, 2025
9	Pre-Amplifier	EMC INSTRUMENT	EMC184045B	980265	Feb. 2, 2025
10	EXA Spectrum Analyzer	Keysight	N9010A	MY56480559	Feb. 2, 2025
11	Test Cable	emci	EMC-104HS-SM-S M-1000	240625	Aug. 5, 2025
12	Test Cable	emci	EMC104HS-SM-SM -5000	240627	Aug. 5, 2025
13	2.4G Filter	HJ	2.4GHz	N/A	Feb. 2, 2025

Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

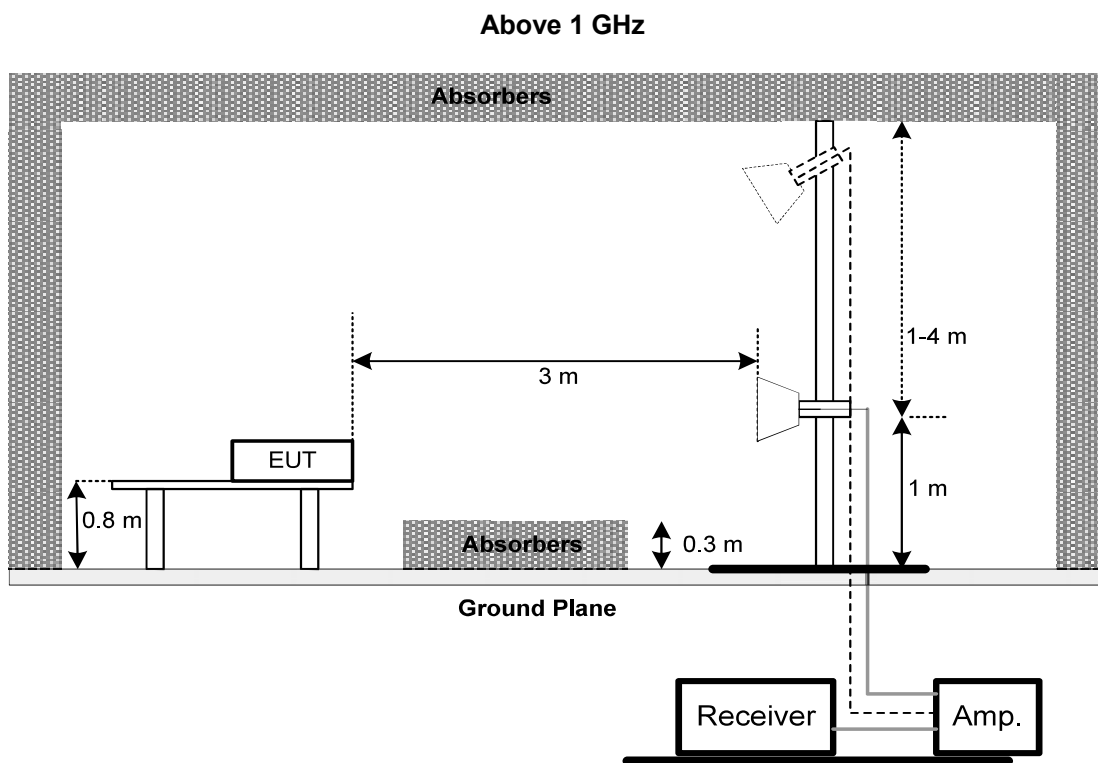
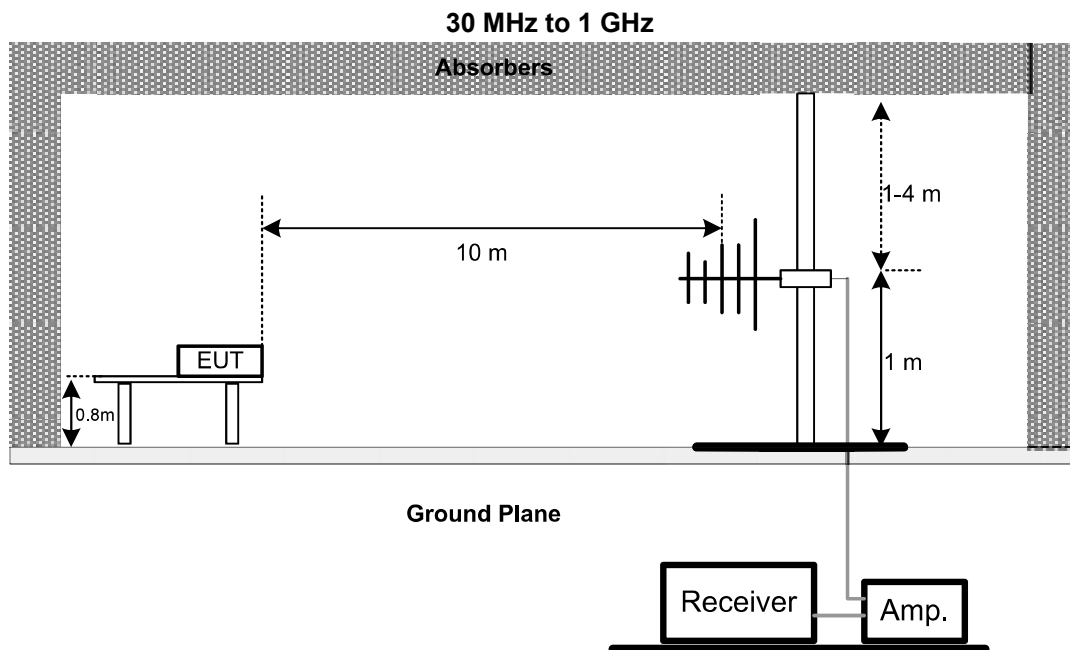
3.3.3 TEST PROCEDURE

- The measuring distance of 10 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation

3.3.5 TEST SETUP



3.3.6 TEST RESULTS-30 MHZ to 1 GHZ

Remark:

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform。
- (2) Measuring frequency range from 30 MHz to 1000 MHz

Test Result Summary:

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

Mode1: Microwave Max Power (BT+WIFI Link)

- 24.79 dB at 30 MHz in the Vertical polarization, 30MHz-1GHz
- 22.65 dB at 320.03 MHz in the Horizontal polarization, 30MHz-1GHz

Mode2: Broil Max Power (BT+WIFI Link)

- 25.63 dB at 990.785 MHz in the Vertical polarization, 30MHz-1GHz
- 20.57 dB at 320.03 MHz in the Horizontal polarization, 30MHz-1GHz

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



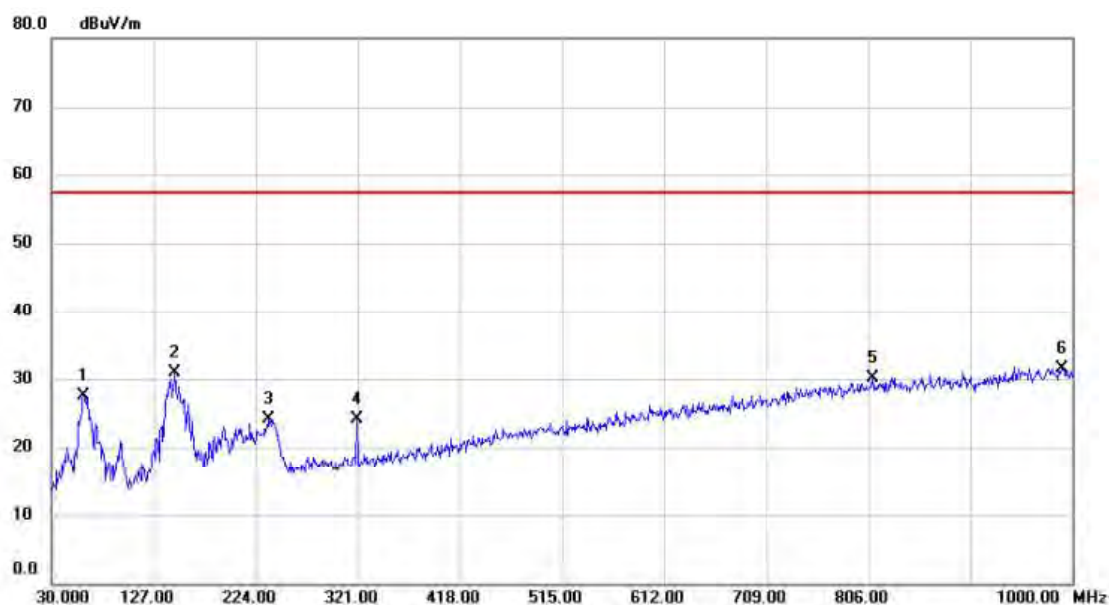
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	*	30.0000	54.82	-18.90	35.92	60.71	-24.79	QP	
2		68.3150	51.14	-18.13	33.01	60.71	-27.70	QP	
3		141.0650	43.77	-15.98	27.79	60.71	-32.92	QP	
4		255.5250	46.77	-15.82	30.95	60.71	-29.76	QP	
5		778.3550	33.85	-3.02	30.83	60.71	-29.88	QP	
6		998.0600	33.01	-0.41	32.60	60.71	-28.11	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



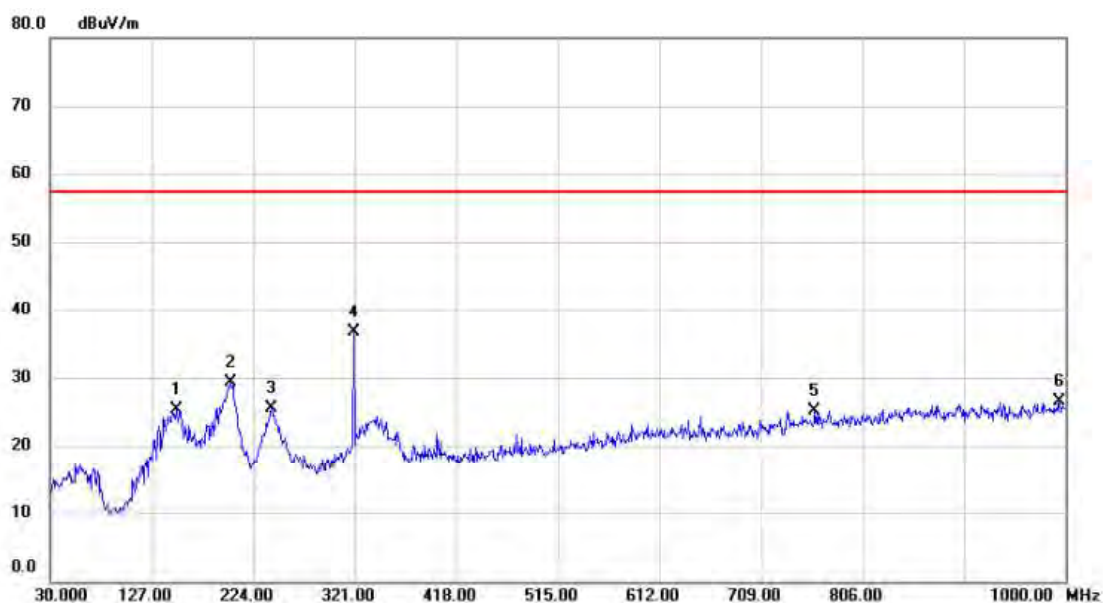
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1		145.4300	41.80	-14.16	27.64	60.71	-33.07	QP	
2		204.6000	46.70	-17.17	29.53	60.71	-31.18	QP	
3		253.1000	44.97	-15.11	29.86	60.71	-30.85	QP	
4	*	320.0300	51.09	-13.03	38.06	60.71	-22.65	QP	
5		640.1300	34.77	-7.09	27.68	60.71	-33.03	QP	
6		714.8200	34.65	-6.45	28.20	60.71	-32.51	QP	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 2		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1		60.0700	44.40	-16.95	27.45	57.21	-29.76	QP	
2		147.3700	46.48	-15.60	30.88	57.21	-26.33	QP	
3		236.6100	41.00	-16.83	24.17	57.21	-33.04	QP	
4		320.0300	37.43	-13.33	24.10	57.21	-33.11	QP	
5		809.8800	32.87	-2.67	30.20	57.21	-27.01	QP	
6	*	990.7850	32.09	-0.51	31.58	57.21	-25.63	QP	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 2		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1		150.2800	39.30	-13.99	25.31	57.21	-31.90	QP	
2		202.6600	46.39	-17.14	29.25	57.21	-27.96	QP	
3		241.4600	41.03	-15.51	25.52	57.21	-31.69	QP	
4	*	320.0300	49.67	-13.03	36.64	57.21	-20.57	QP	
5		760.4100	30.89	-5.76	25.13	57.21	-32.08	QP	
6		994.1800	30.64	-4.04	26.60	57.21	-30.61	QP	

3.3.7 TEST RESULTS- Above 1 GHZ

Remark:

- (1) All readings are AVG unless otherwise stated QP in column of 『Note』 .
- (2) Measuring frequency range from Above 1 GHz

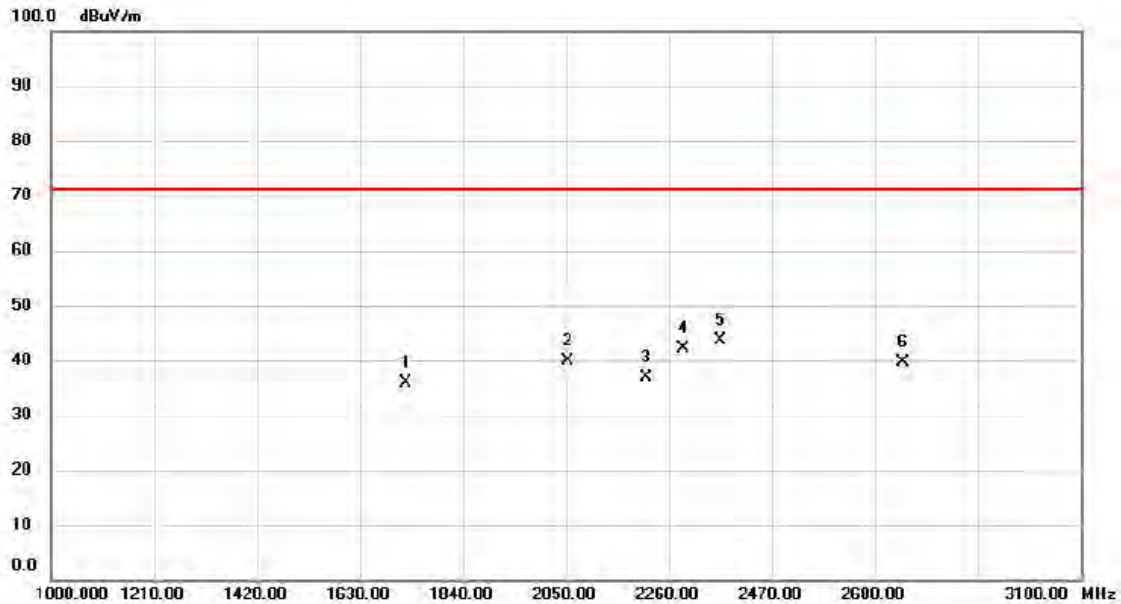
Test Result Summary:

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

Mode1: Microwave Max Power (BT+WIFI Link)

- 11.23 dB at 4284.55 MHz in the Vertical polarization, 1-25GHz
- 23.42 dB at 2293.6 MHz in the Horizontal polarization, 1-25GHz

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



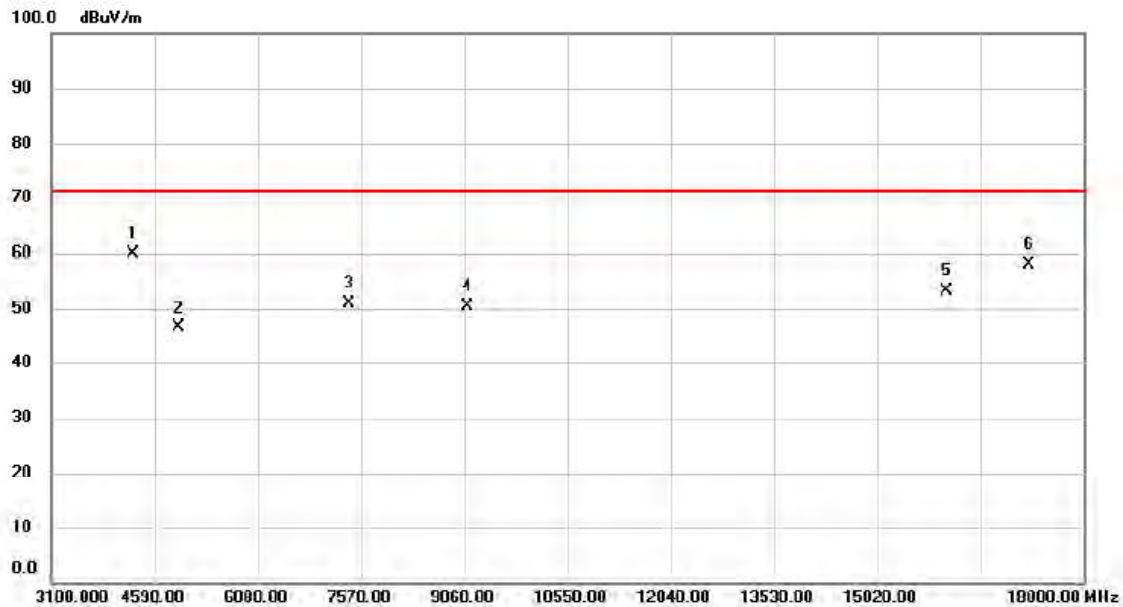
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1		1724.500	52.35	-16.59	35.76	71.17	-35.41	AVG	
2		2053.150	53.98	-14.07	39.91	71.17	-31.26	AVG	
3		2213.800	50.47	-13.67	36.80	71.17	-34.37	AVG	
4		2288.350	55.71	-13.47	42.24	71.17	-28.93	AVG	
5	*	2365.000	56.87	-13.27	43.60	71.17	-27.57	AVG	
6		2736.700	52.24	-12.62	39.62	71.17	-31.55	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over limit	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2156.050	54.67	-13.81	40.86	71.17	-30.31	AVG
2		2210.650	59.73	-13.67	46.06	71.17	-25.11	AVG
3	*	2293.600	61.21	-13.46	47.75	71.17	-23.42	AVG
4		2334.550	61.03	-13.35	47.68	71.17	-23.49	AVG
5		2702.050	56.06	-12.66	43.40	71.17	-27.77	AVG
6		2786.050	53.12	-12.56	40.56	71.17	-30.61	AVG

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



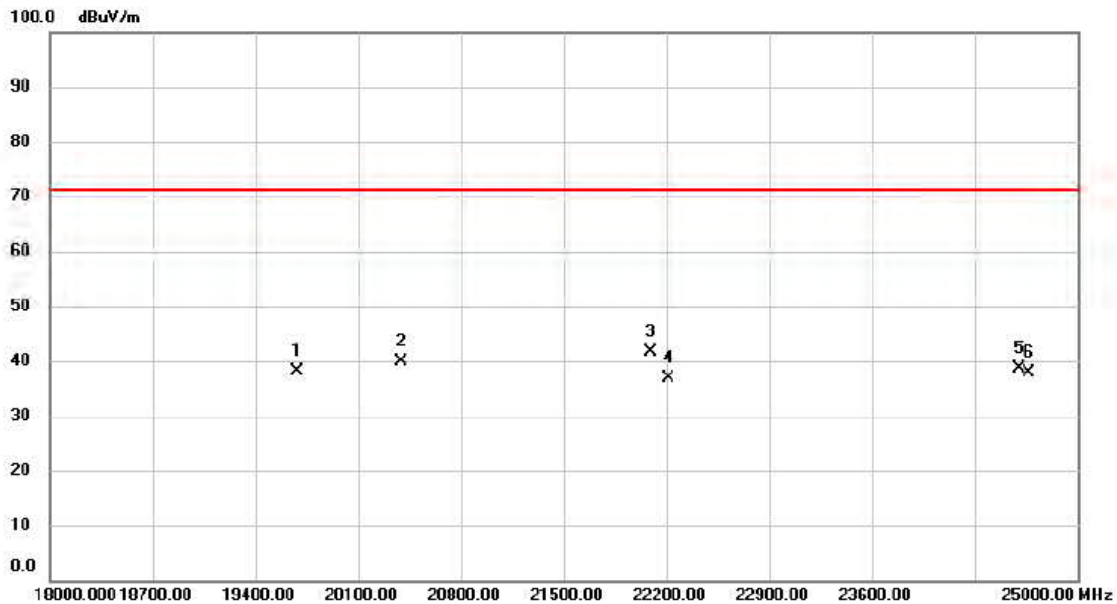
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	*	4284.550	69.46	-9.52	59.94	71.17	-11.23	AVG	
2		4940.150	53.47	-7.16	46.31	71.17	-24.86	AVG	
3		7406.100	55.13	-4.35	50.78	71.17	-20.39	AVG	
4		9104.700	48.99	1.42	50.41	71.17	-20.76	AVG	
5		16025.750	42.99	10.17	53.16	71.17	-18.01	AVG	
6		17210.300	47.16	10.73	57.89	71.17	-13.28	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



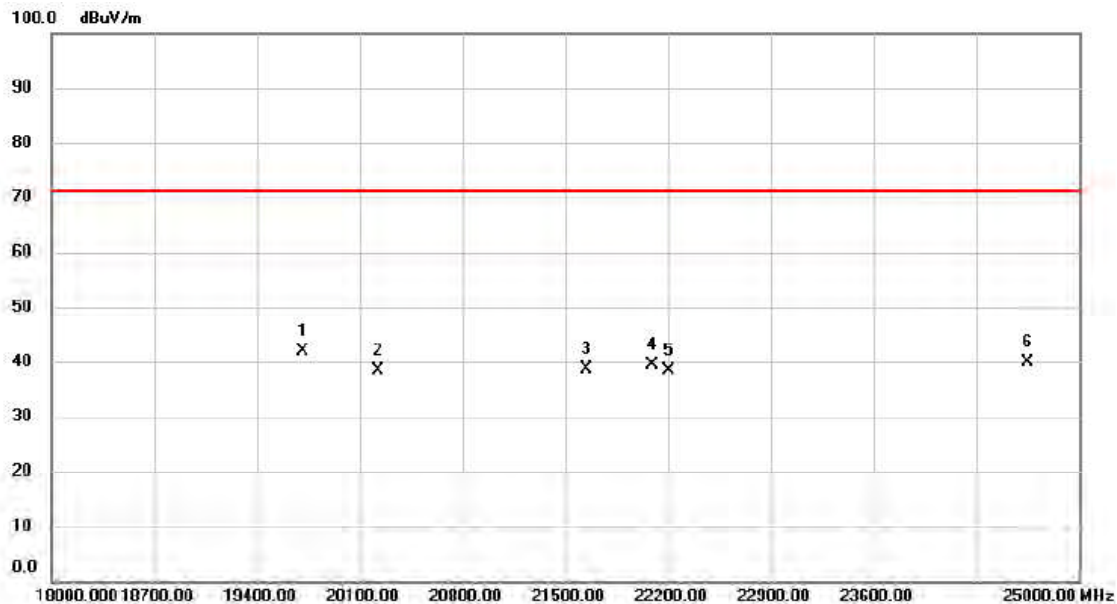
No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	4277.100	52.64	-9.54	43.10	71.17	-28.07	AVG	
2	4843.300	47.07	-7.51	39.56	71.17	-31.61	AVG	
3	4940.150	48.46	-7.16	41.30	71.17	-29.87	AVG	
4	7413.550	41.57	-4.37	37.20	71.17	-33.97	AVG	
5	14841.200	35.15	7.85	43.00	71.17	-28.17	AVG	
6 *	17329.500	33.83	10.57	44.40	71.17	-26.77	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1		19687.000	46.62	-8.46	38.16	71.17	-33.01	AVG	
2		20394.000	47.54	-7.74	39.80	71.17	-31.37	AVG	
3	*	22091.500	47.89	-6.28	41.61	71.17	-29.56	AVG	
4		22210.500	42.98	-6.12	36.86	71.17	-34.31	AVG	
5		24604.500	42.48	-3.95	38.53	71.17	-32.64	AVG	
6		24667.500	41.74	-3.81	37.93	71.17	-33.24	AVG	

Test Voltage	AC 120V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over limit dB	Detector	Comment
1	*	19715.000	50.42	-8.44	41.98	71.17	-29.19	AVG	
2		20226.000	46.43	-7.94	38.49	71.17	-32.68	AVG	
3		21643.500	45.43	-6.80	38.63	71.17	-32.54	AVG	
4		22088.000	45.54	-6.28	39.26	71.17	-31.91	AVG	
5		22200.000	44.47	-6.13	38.34	71.17	-32.83	AVG	
6		24650.000	43.65	-3.84	39.81	71.17	-31.36	AVG	

4. EUT TEST PHOTO

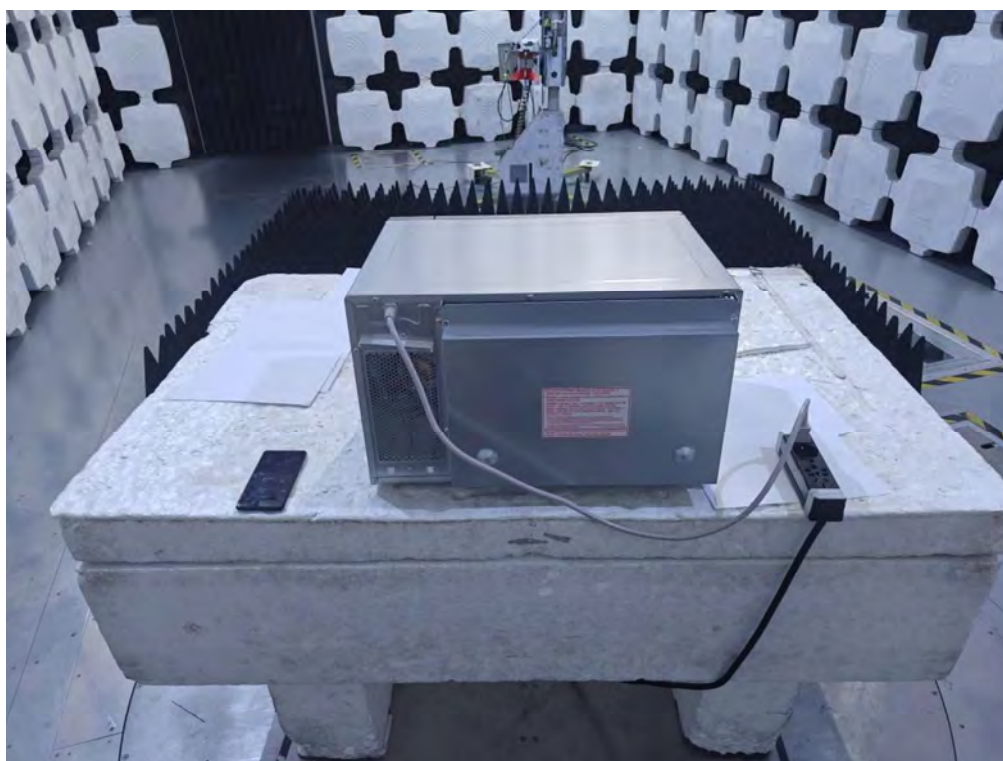
AC Power Line Conducted Emissions



Radiated Emissions 30 MHz to 1 GHz



Radiated Emissions 1 GHz to 18 GHz

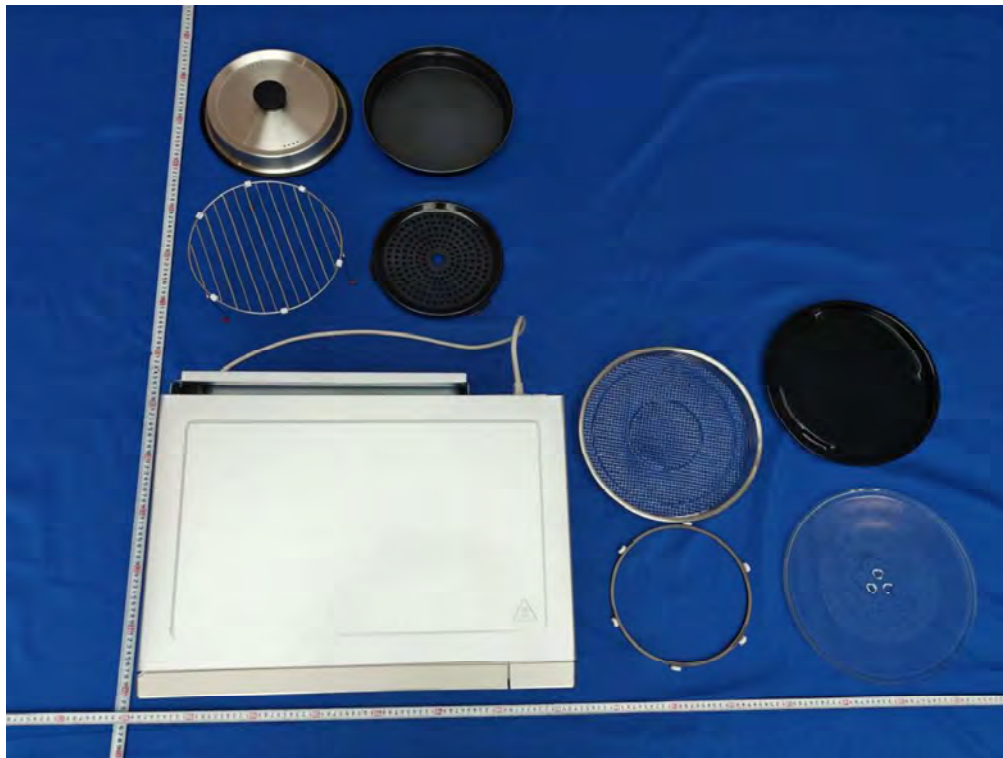


Radiated Emissions 18 GHz to 25 GHz

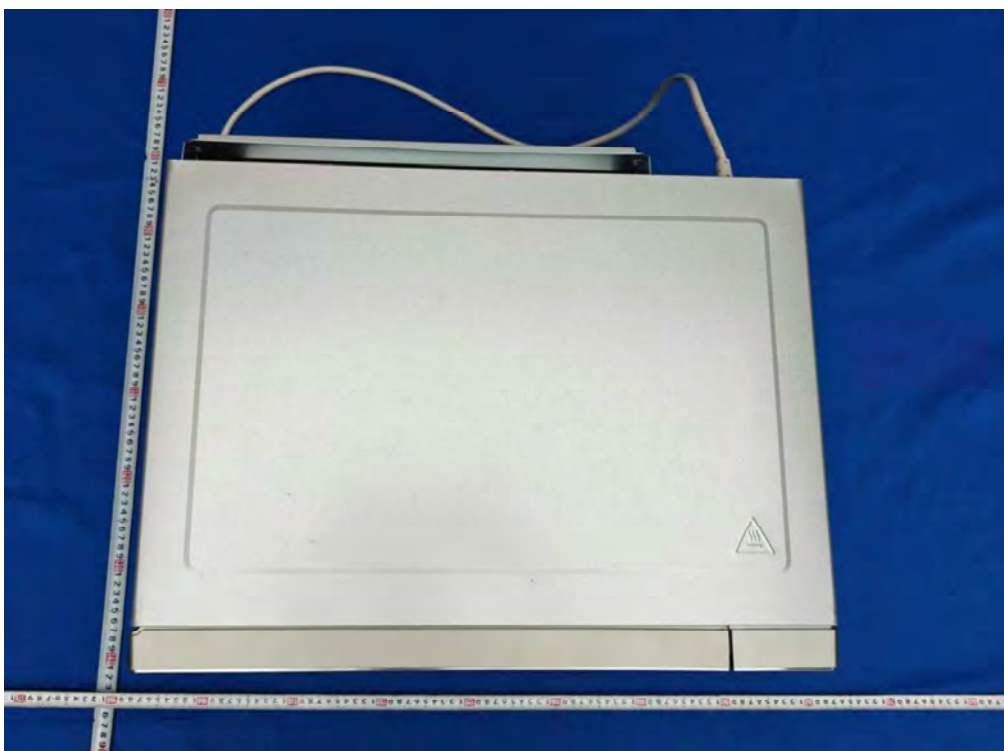


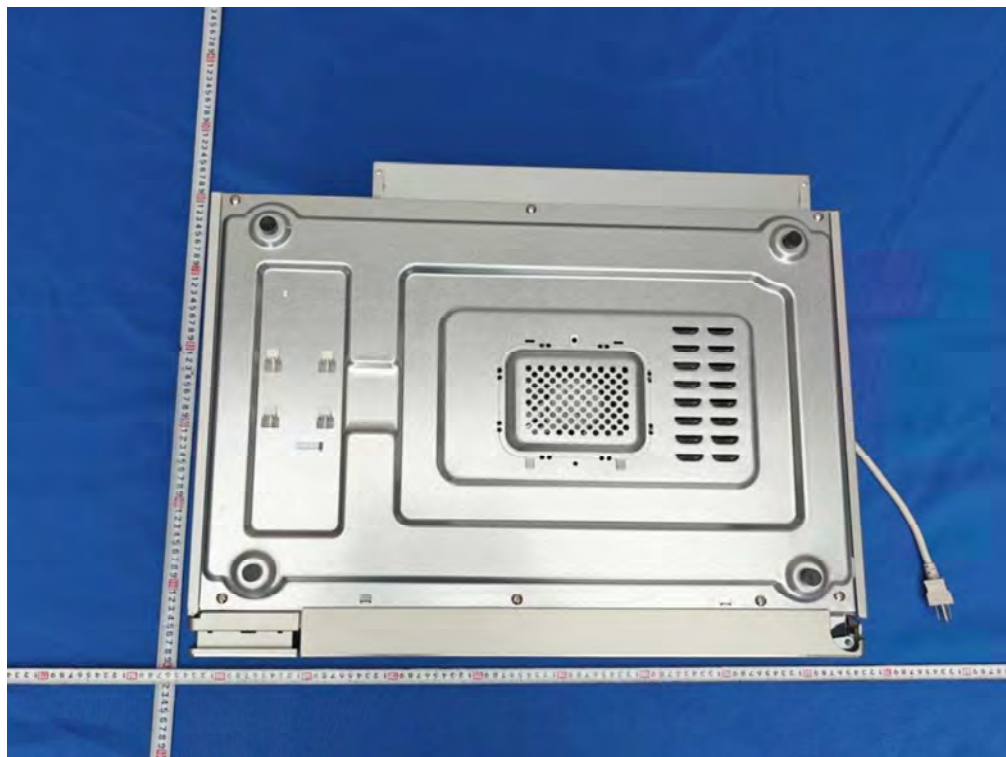
APPENDIX

(Photos of EUT)

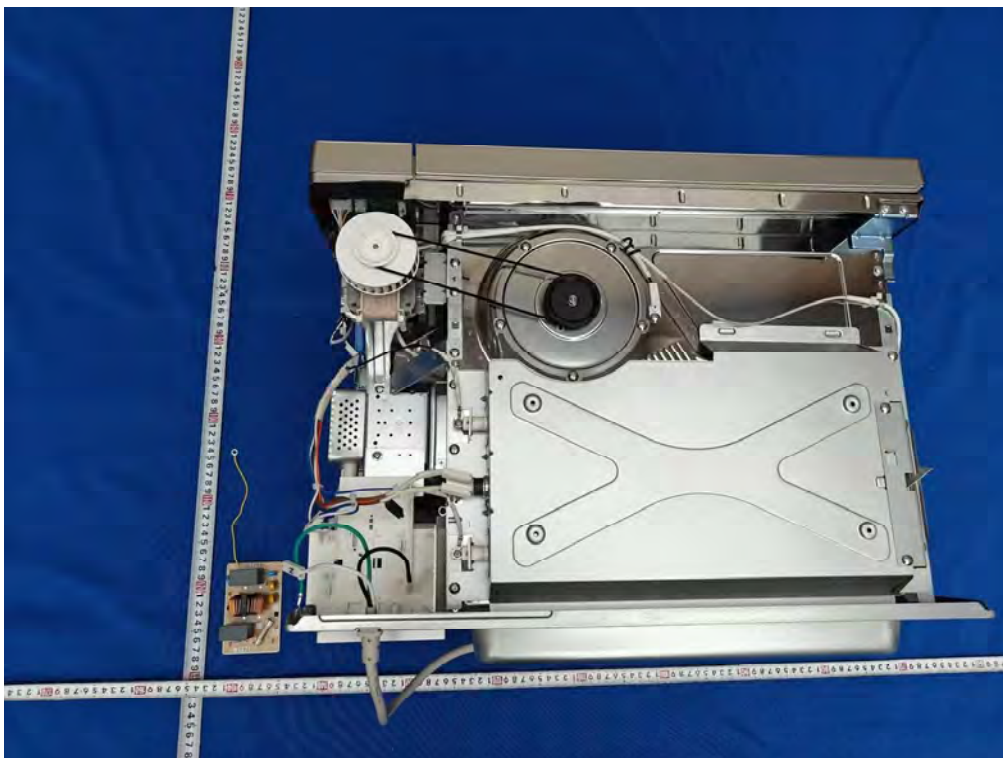


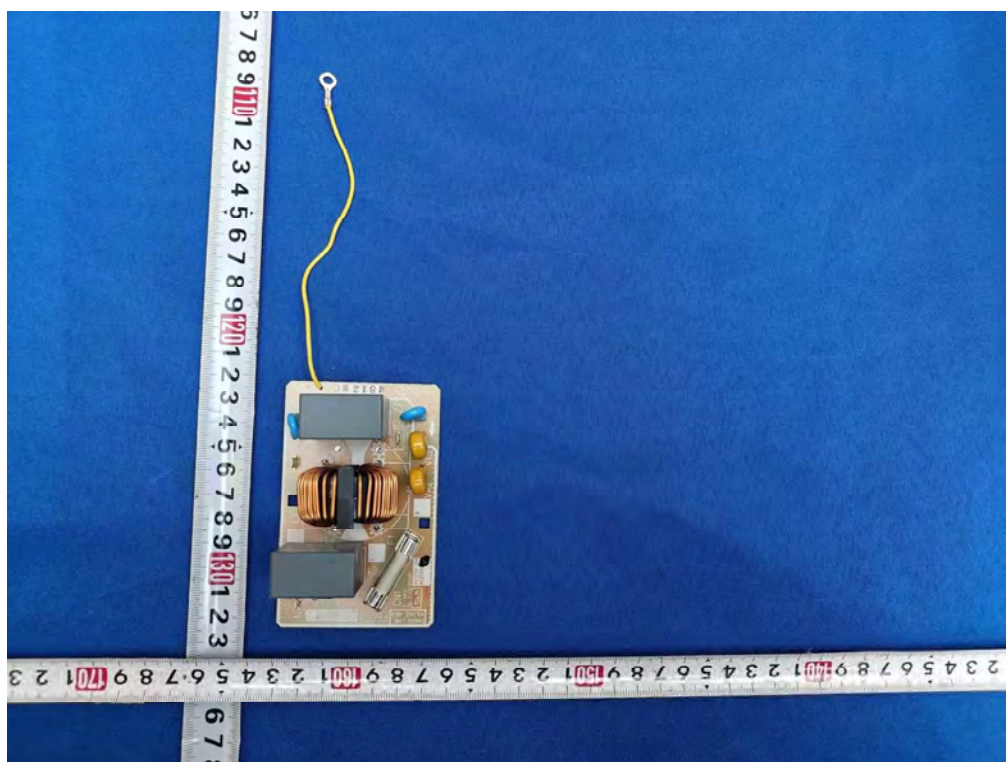
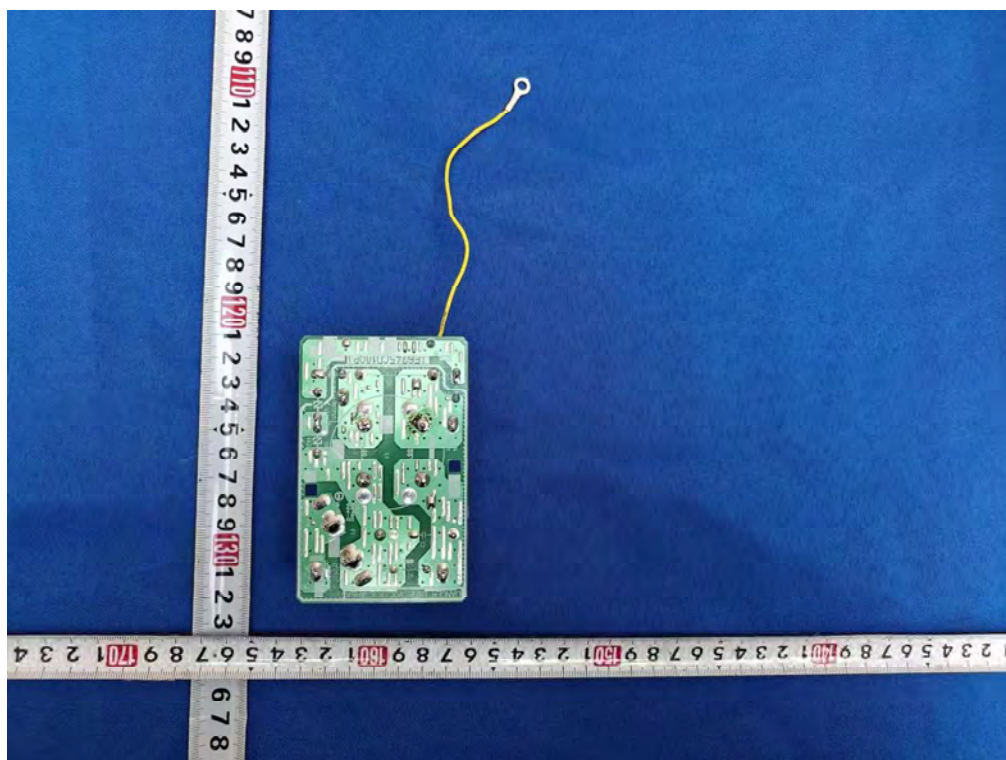


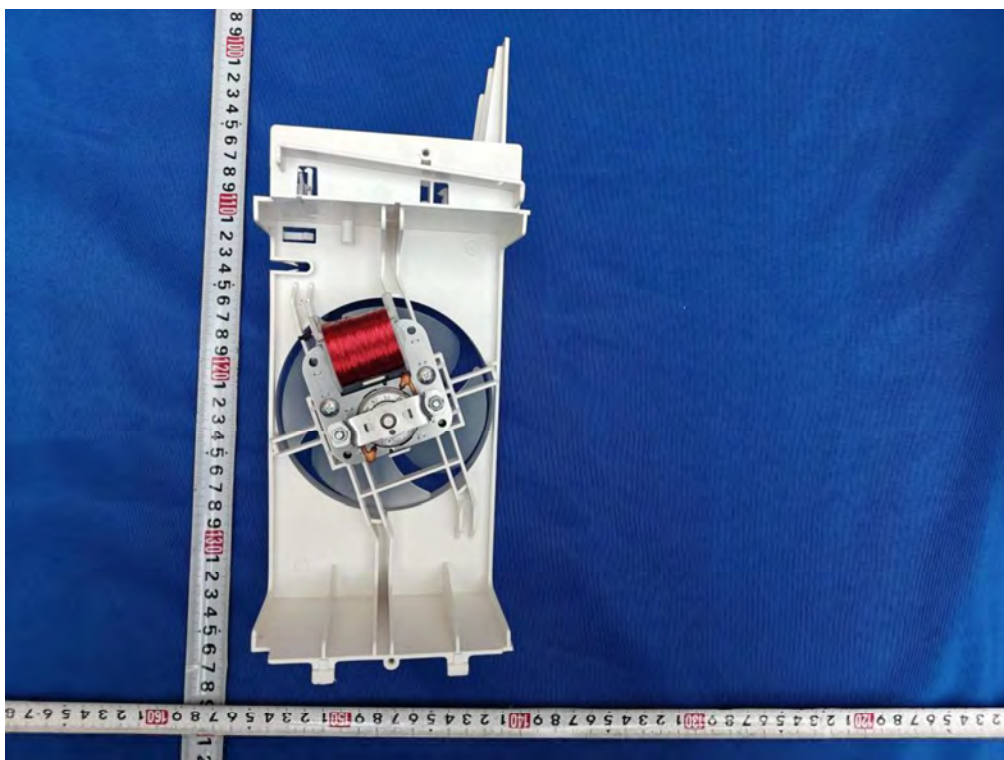
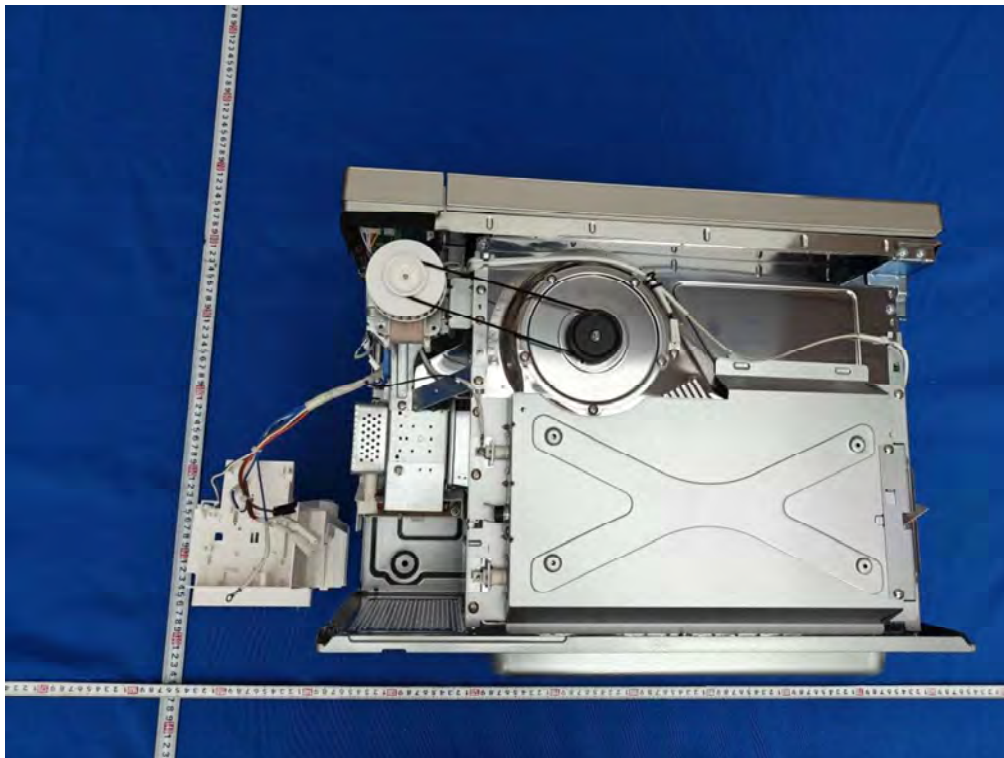


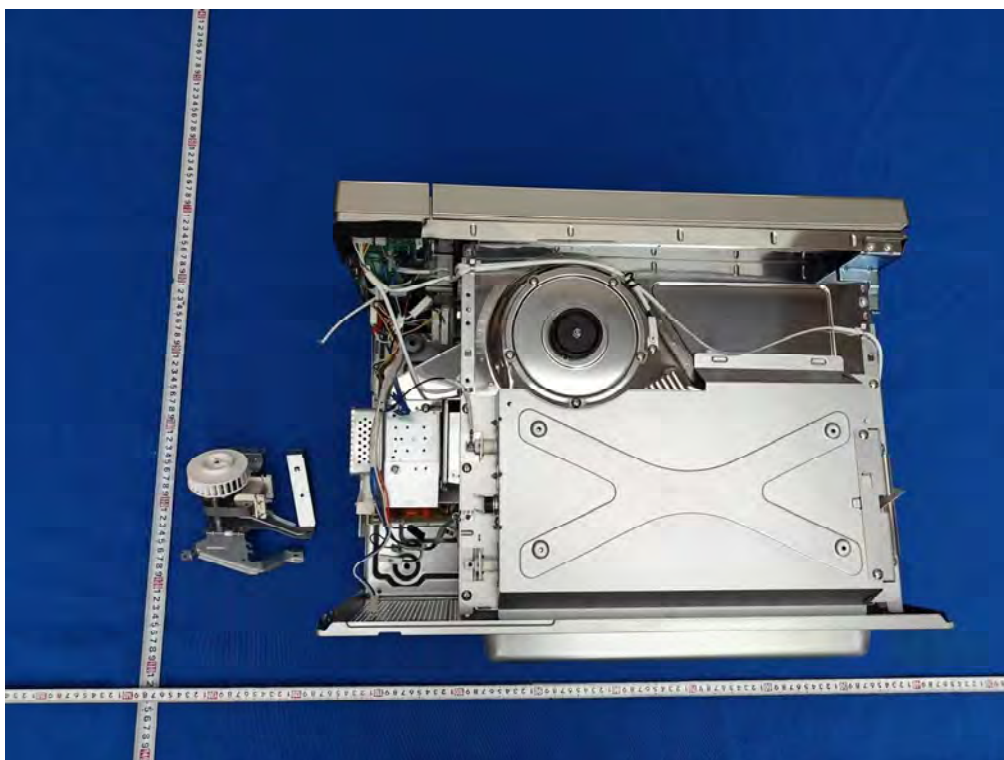
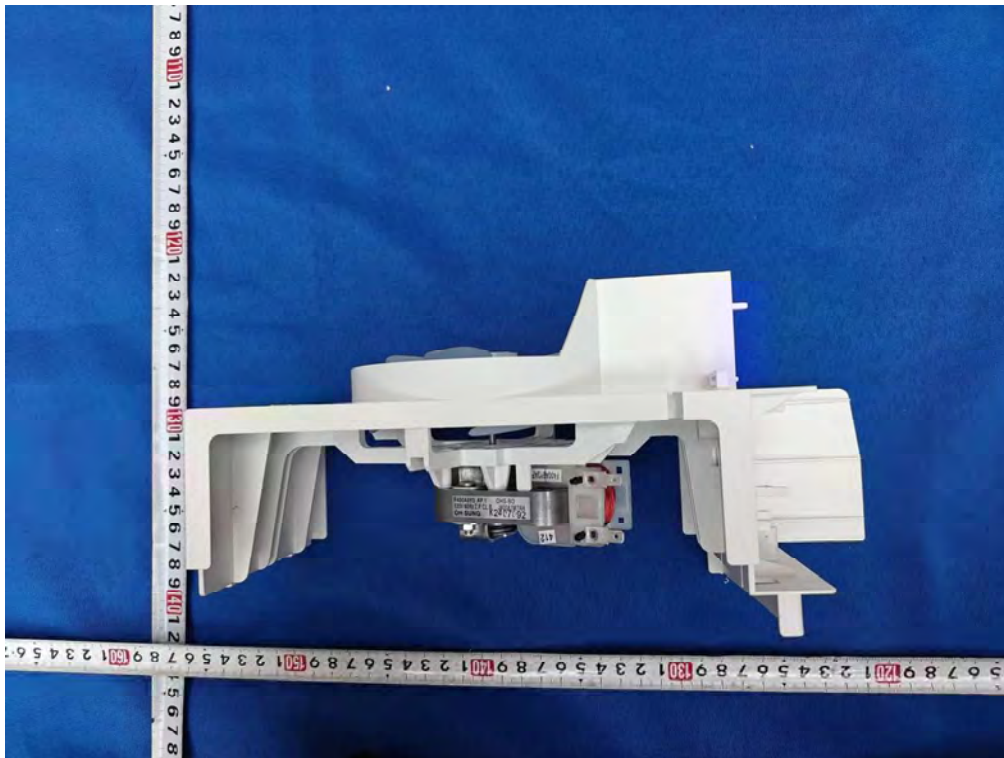


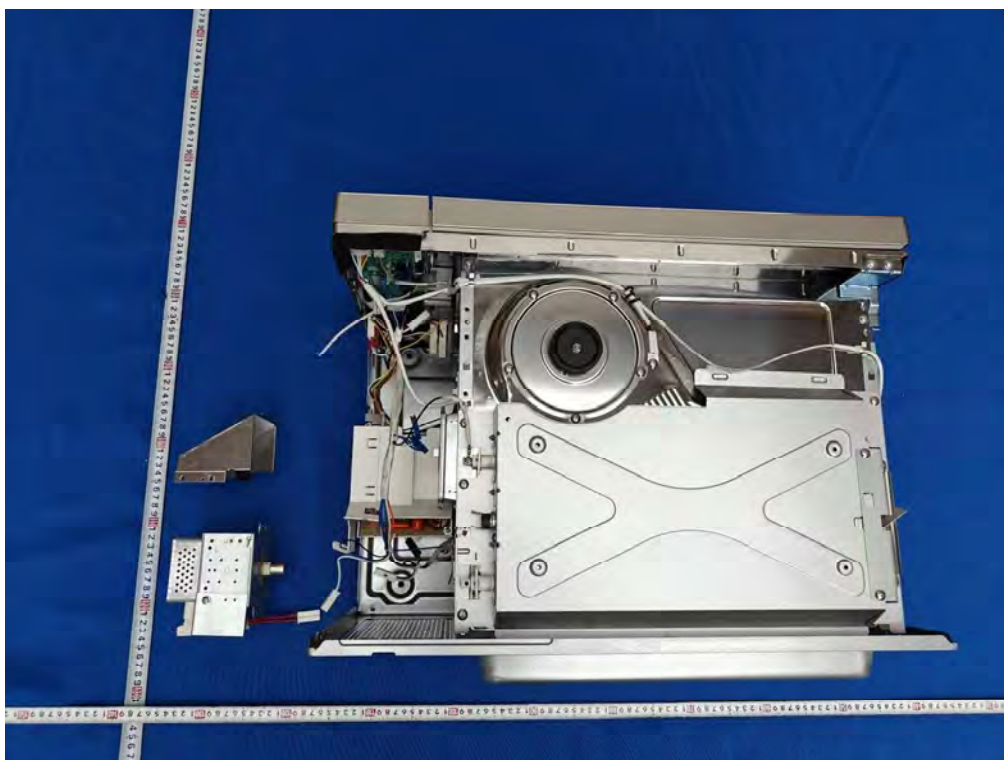
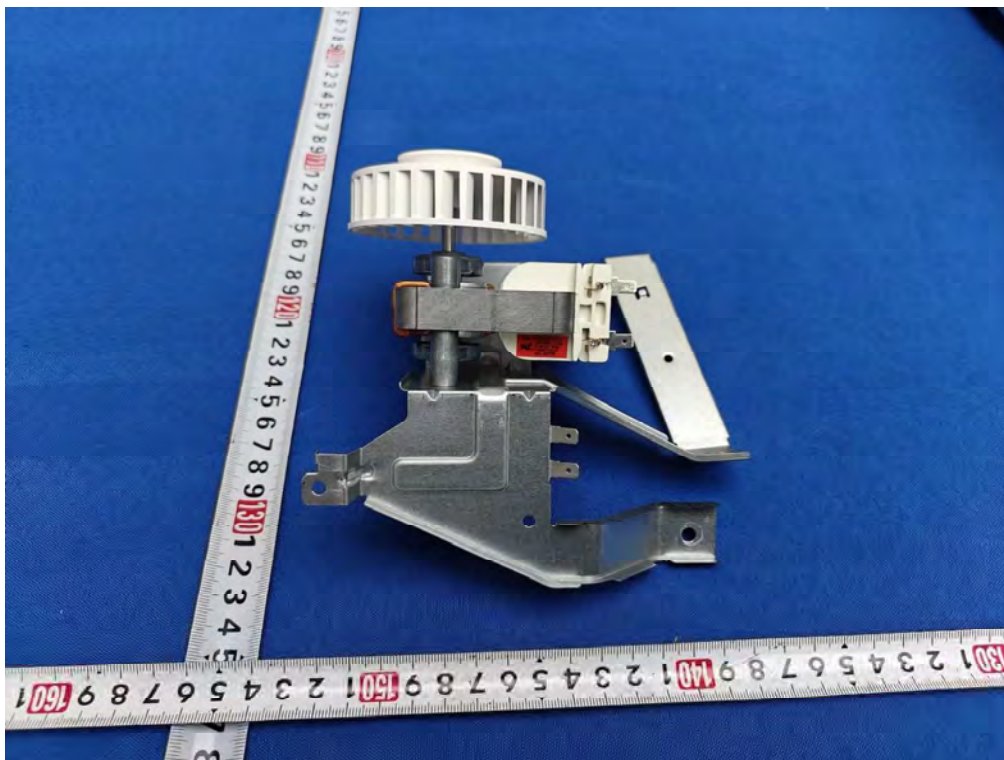


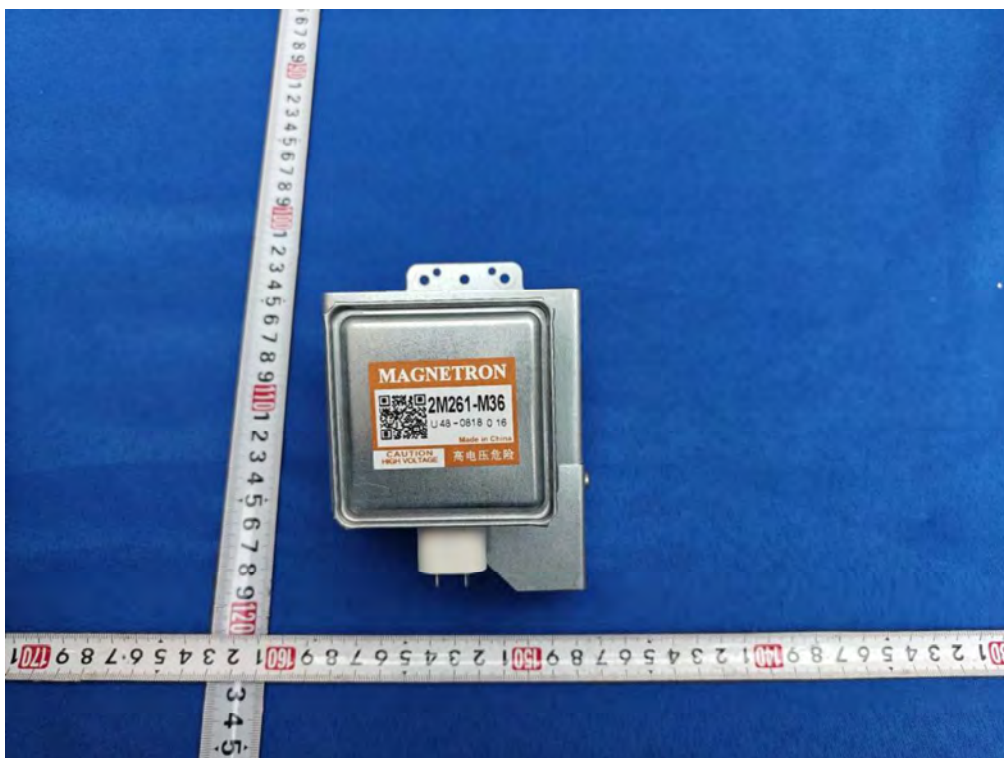
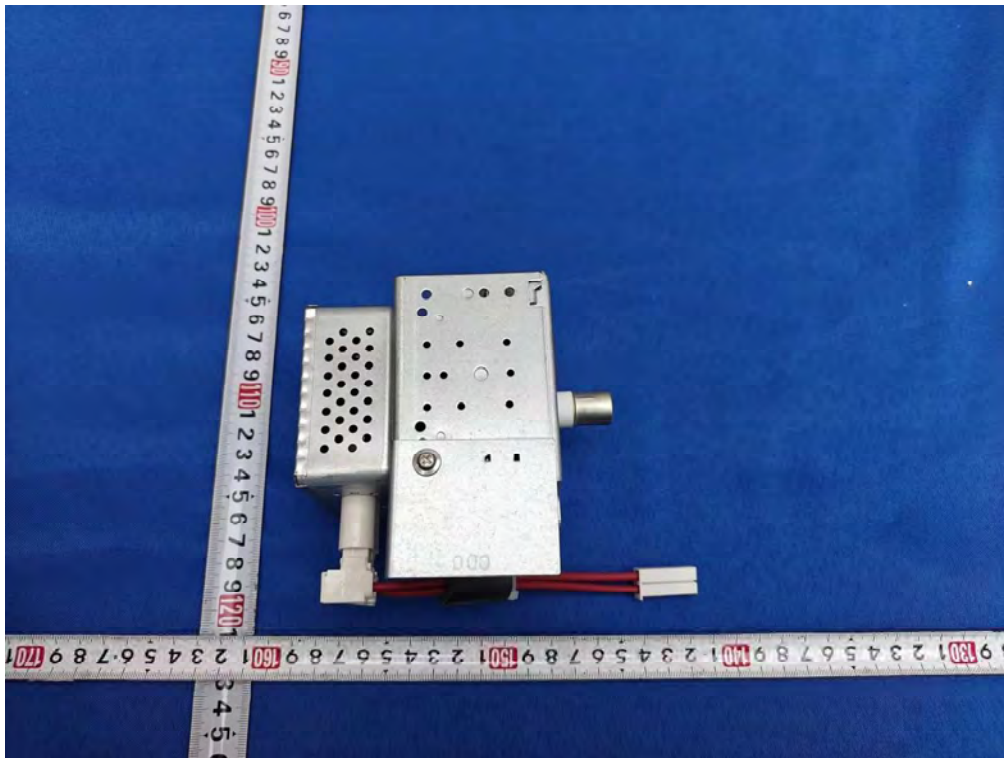


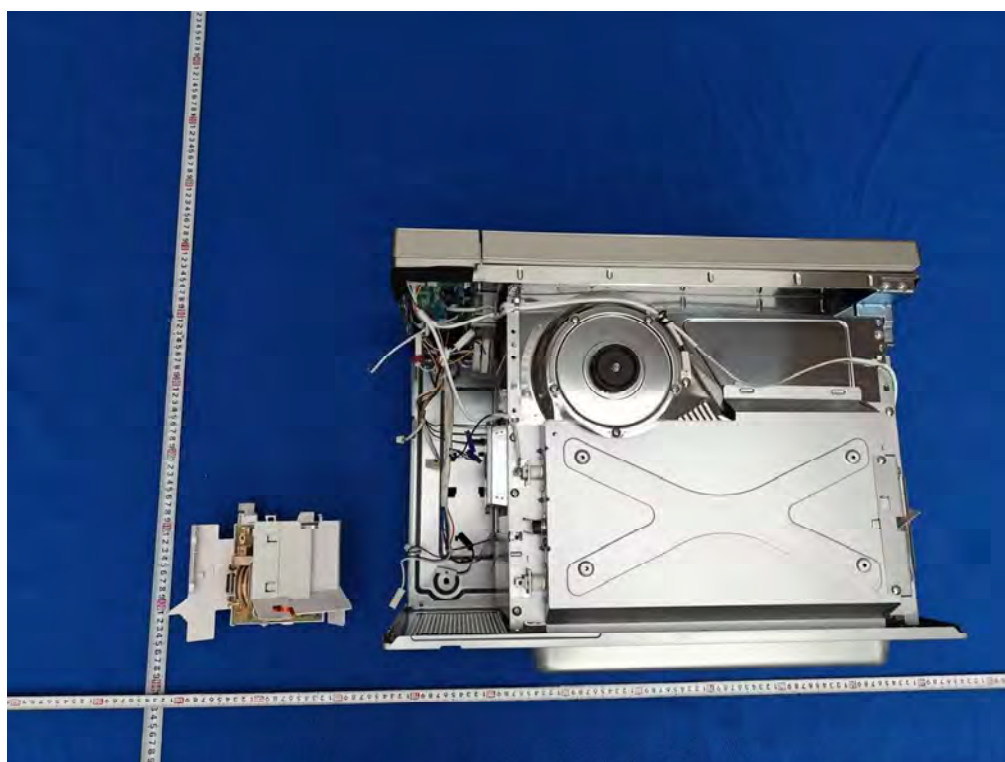
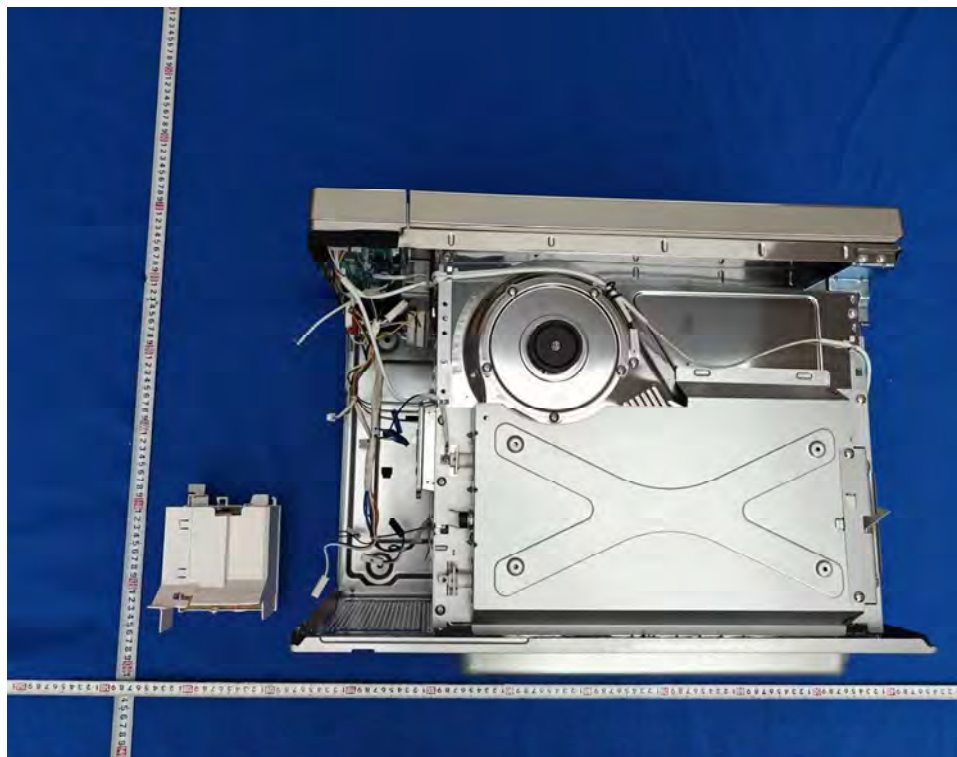


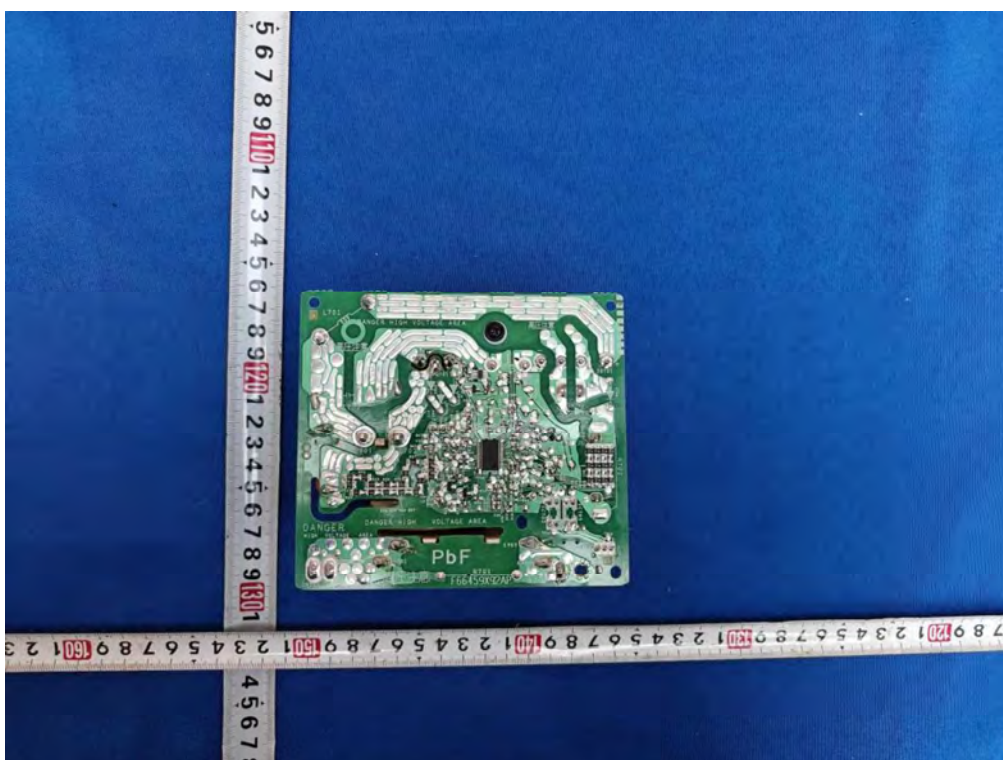
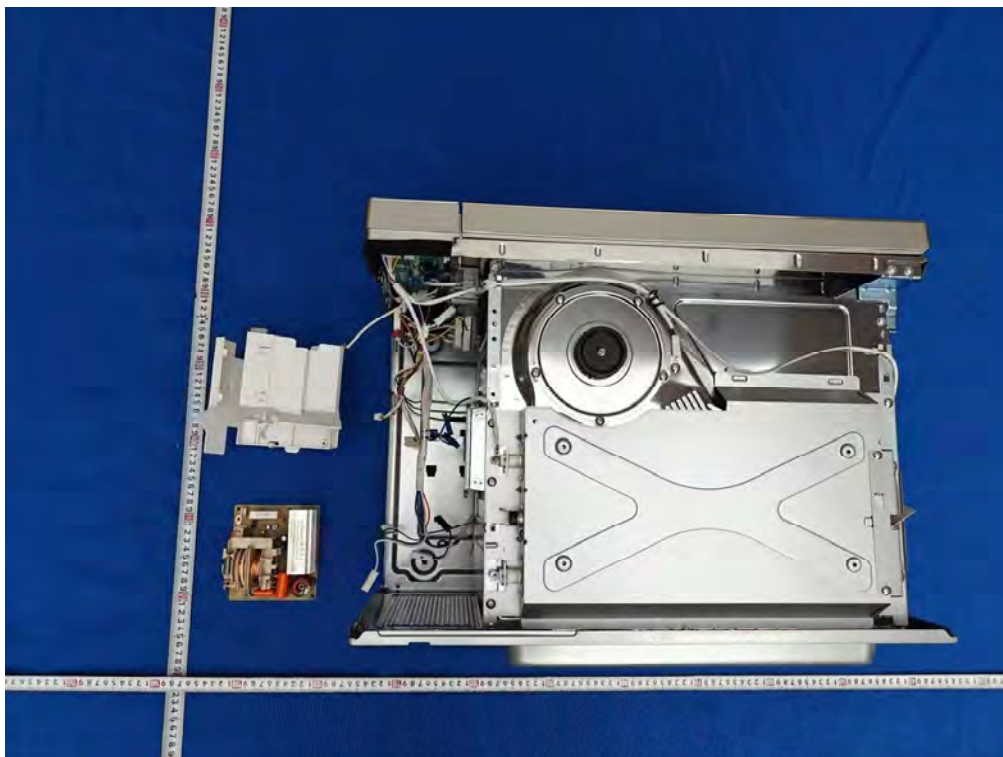


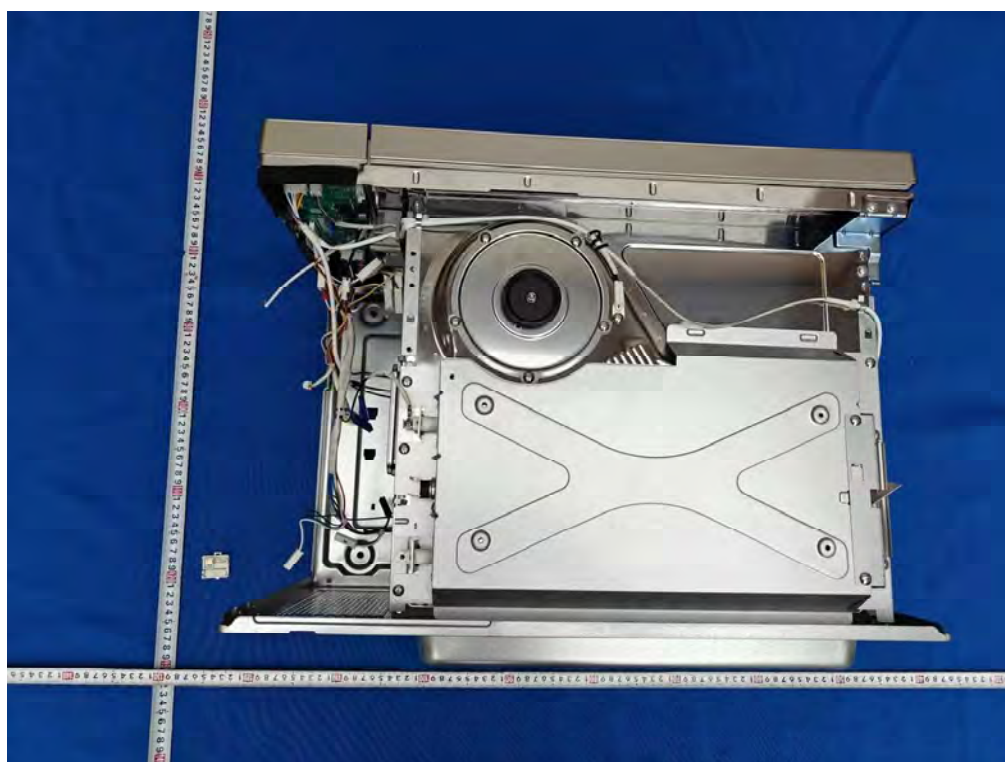
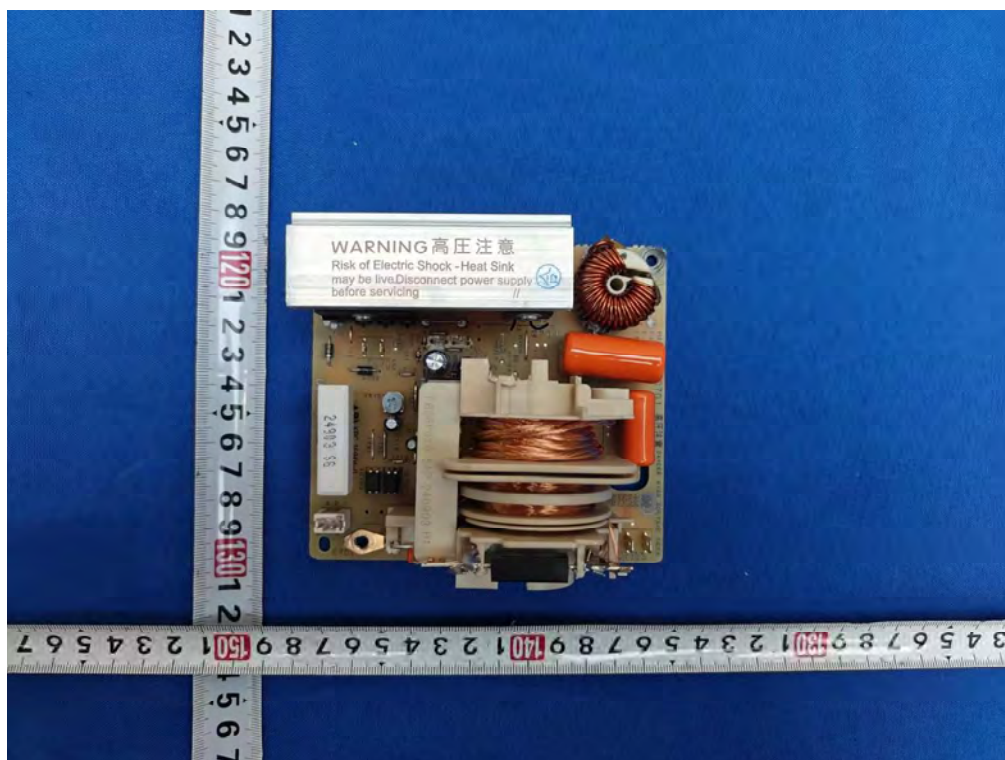


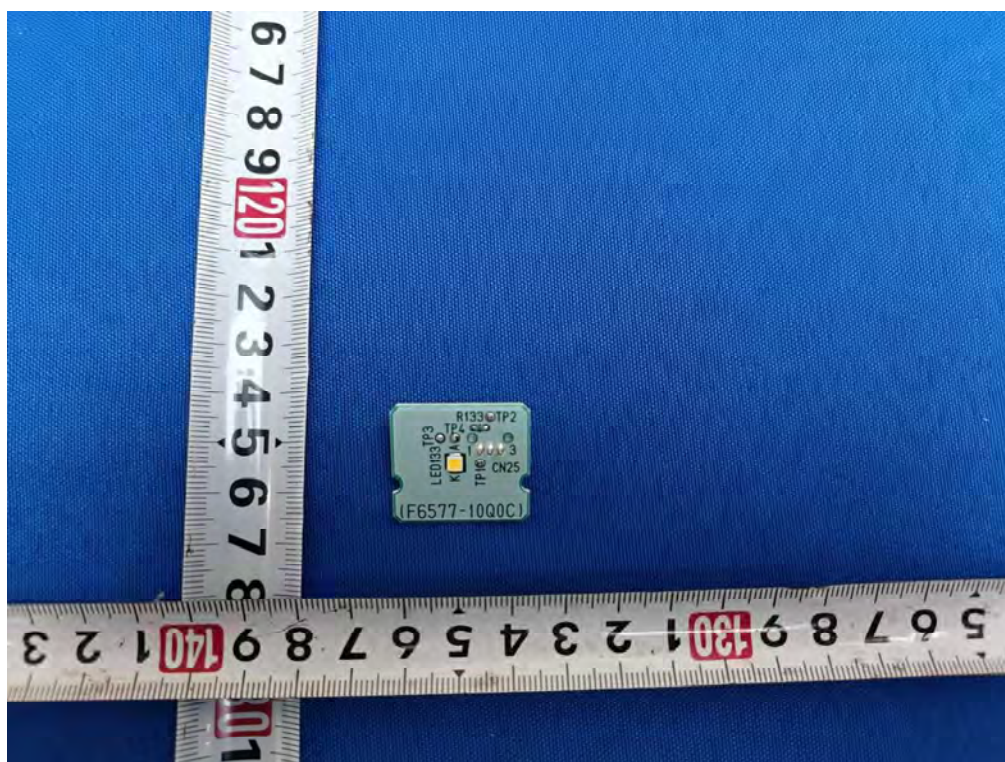
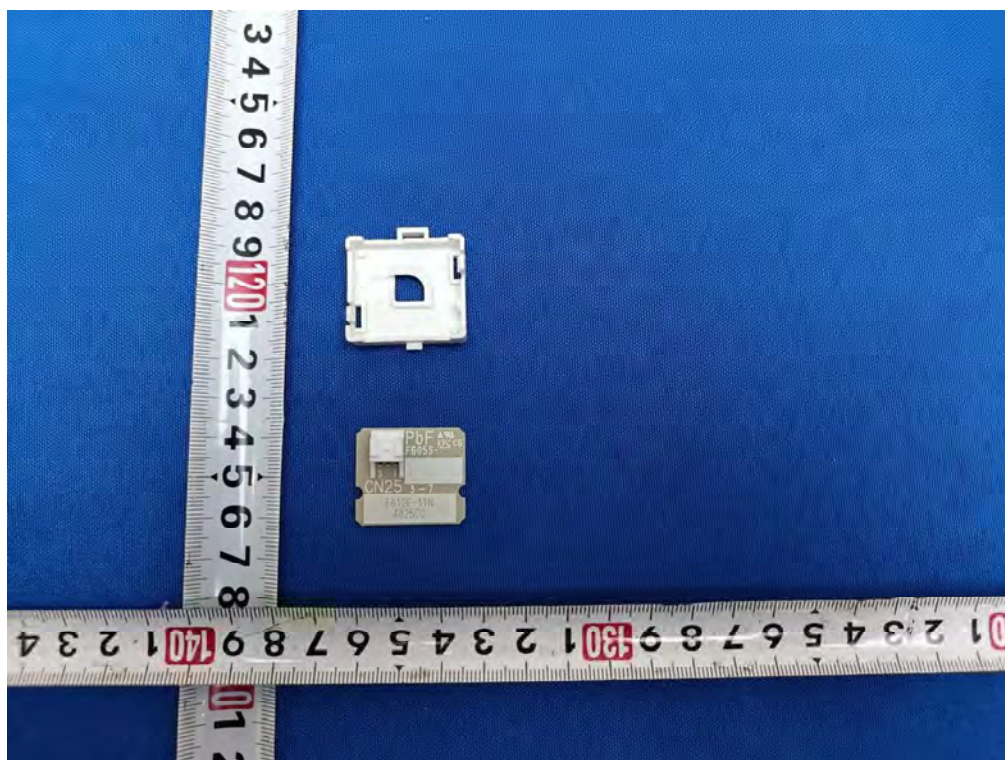


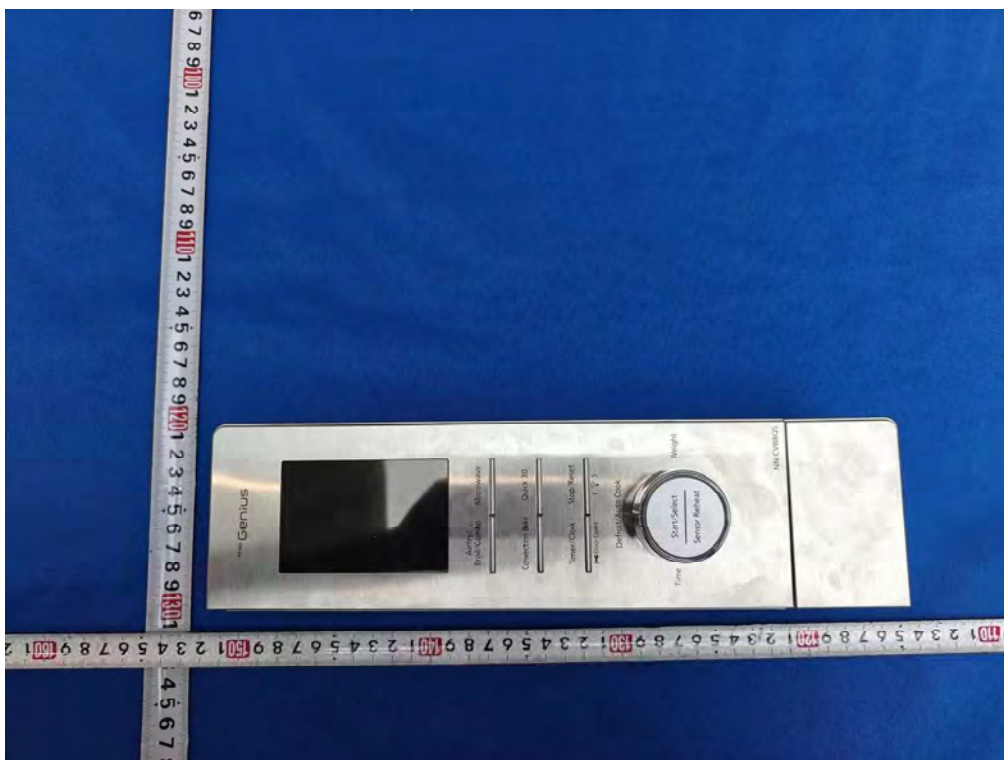
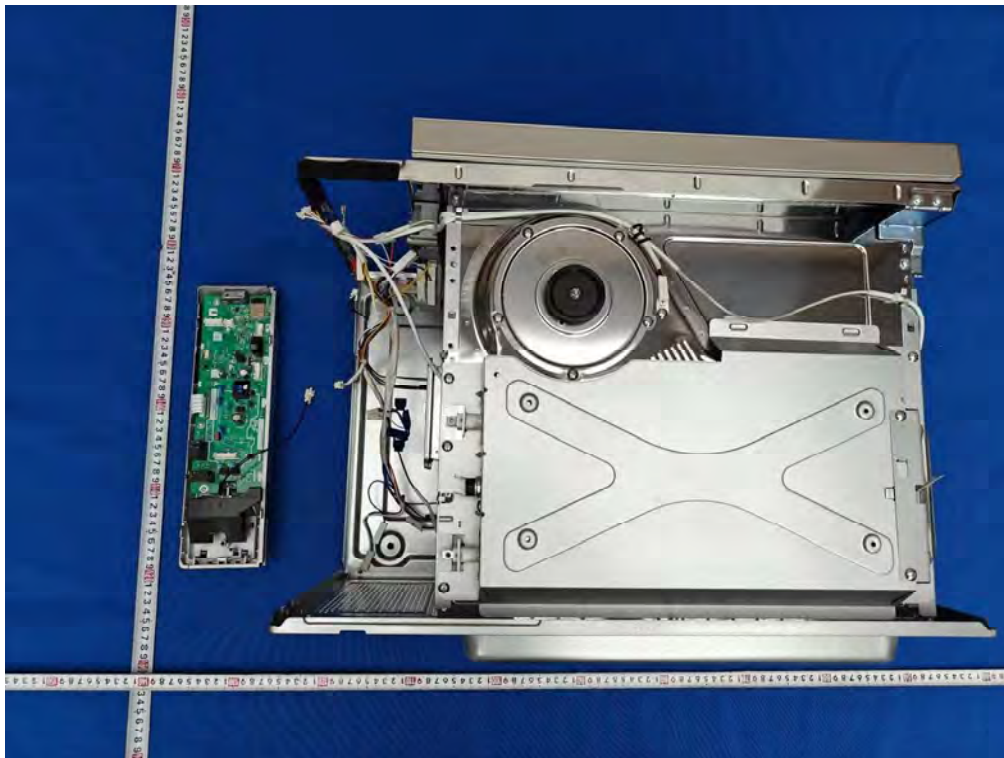


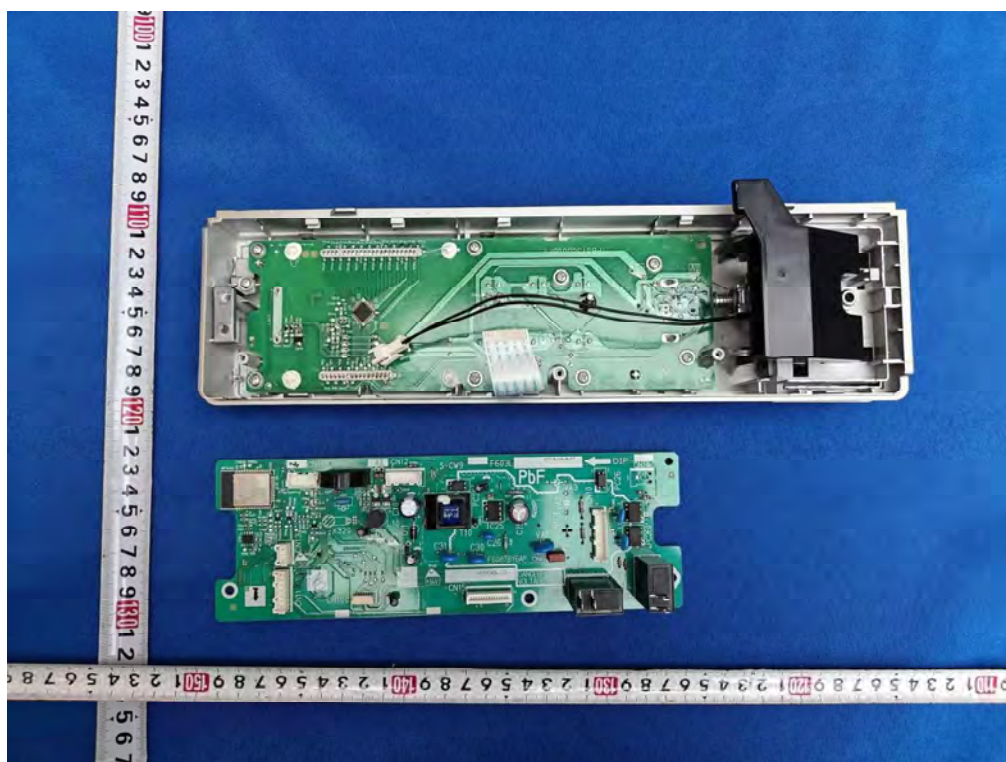
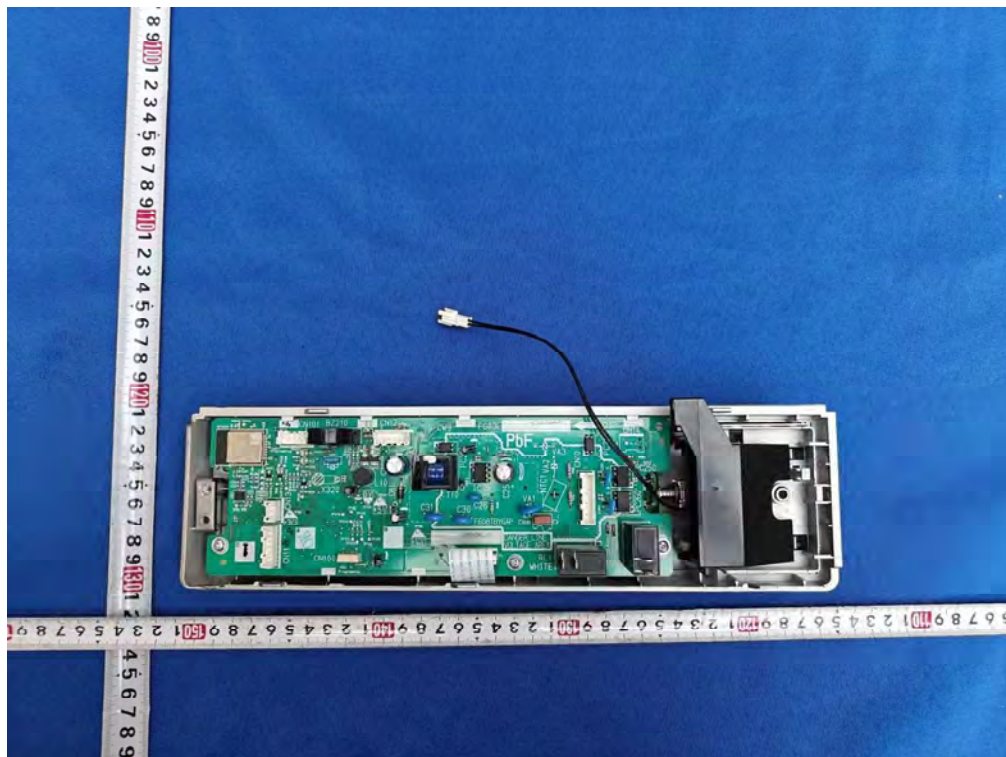


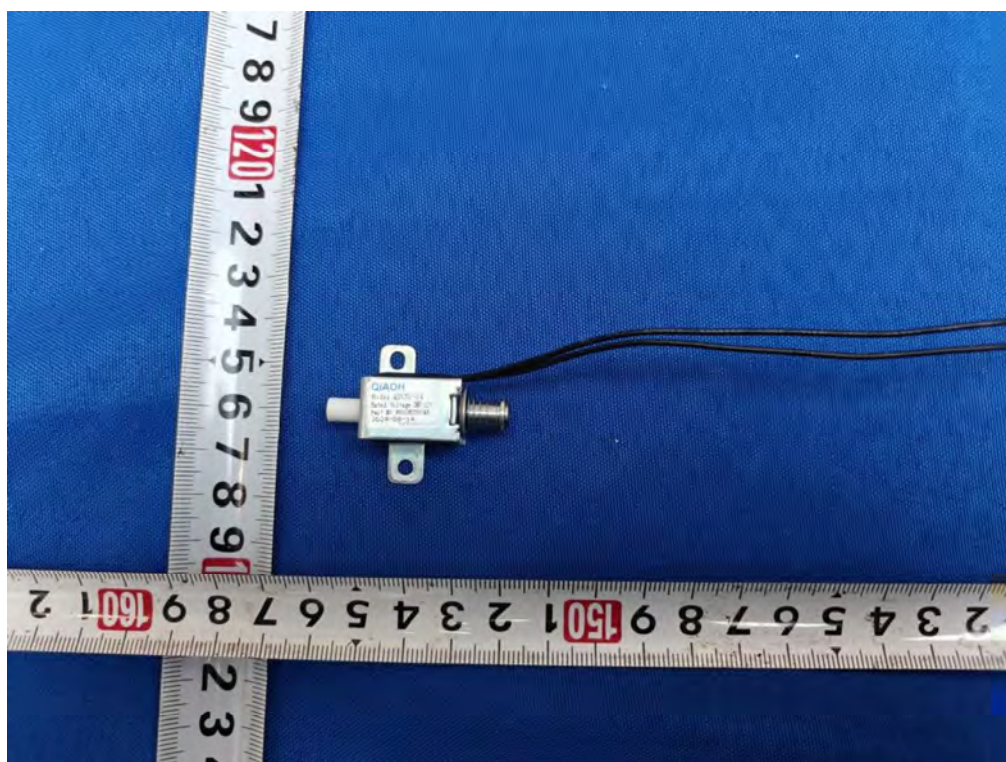
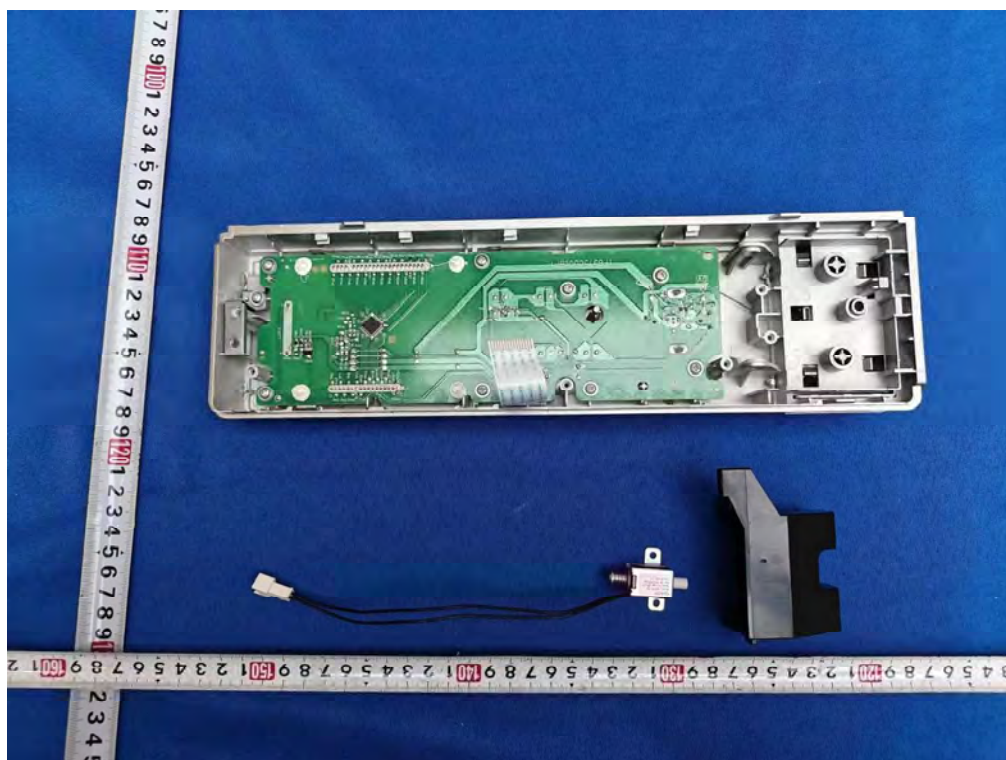


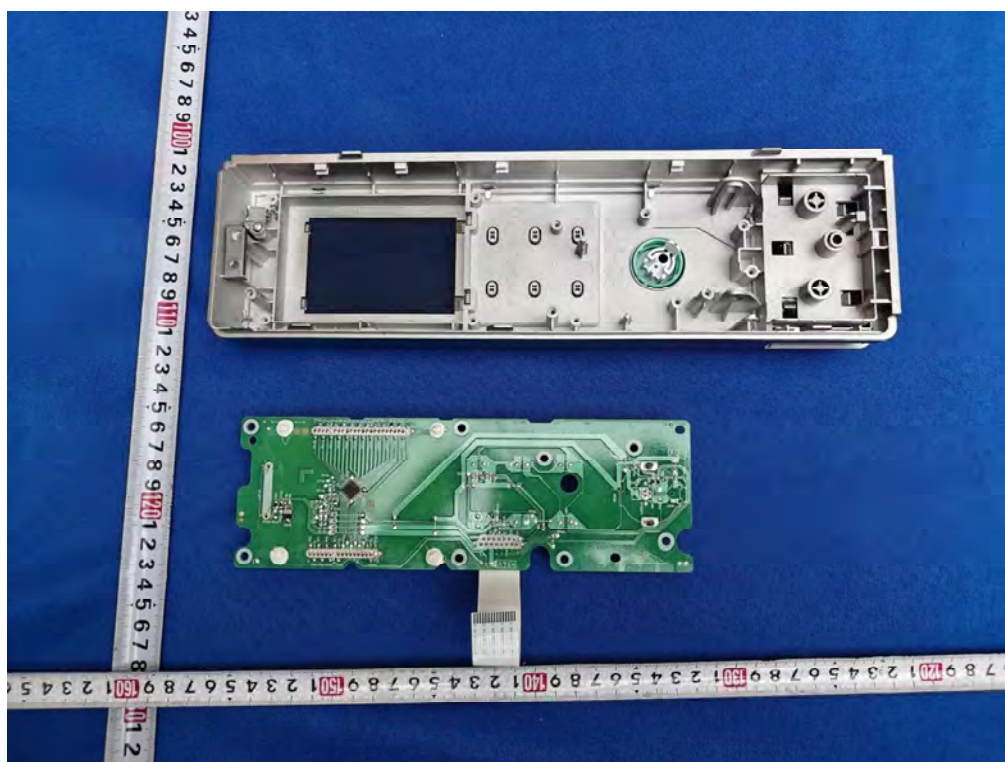
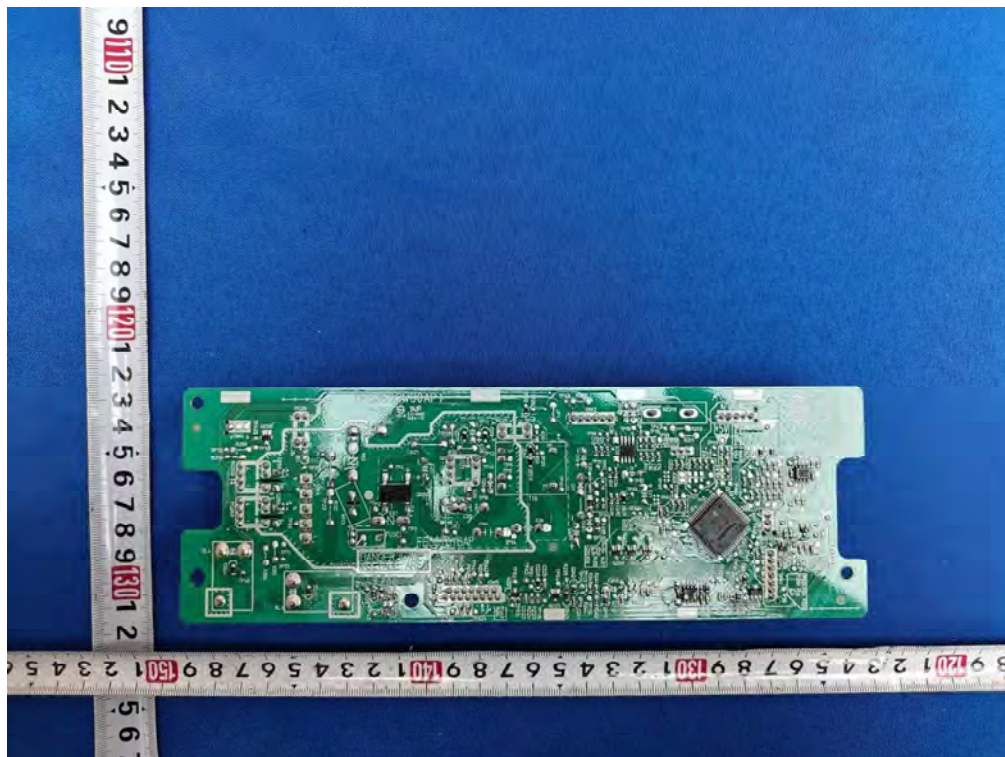


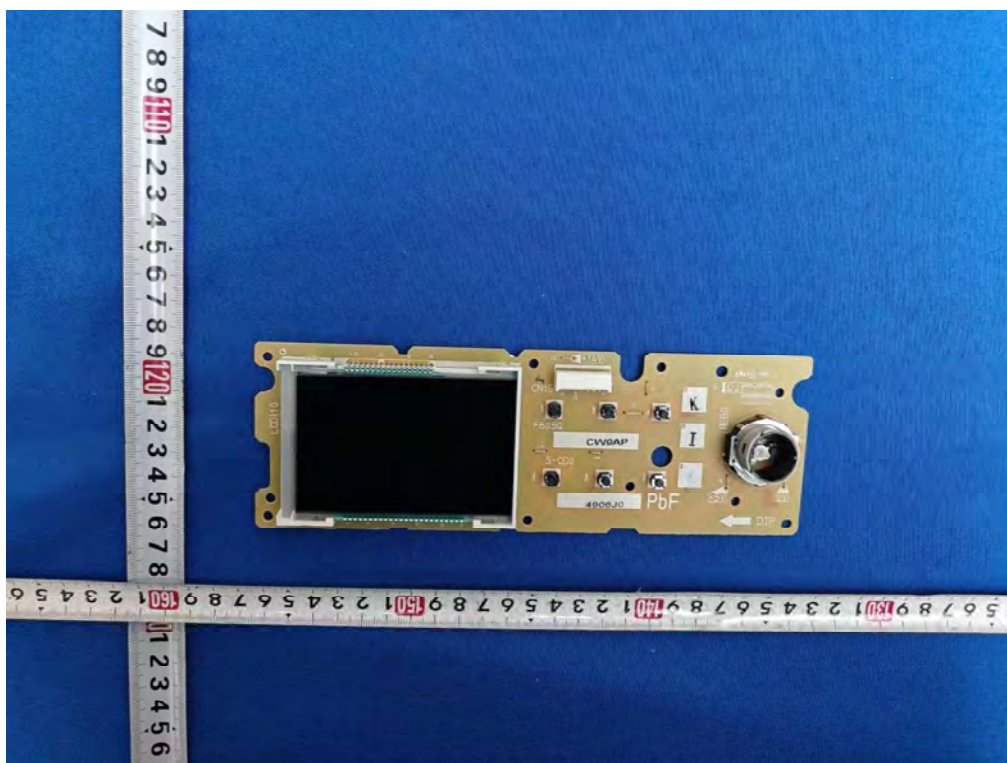
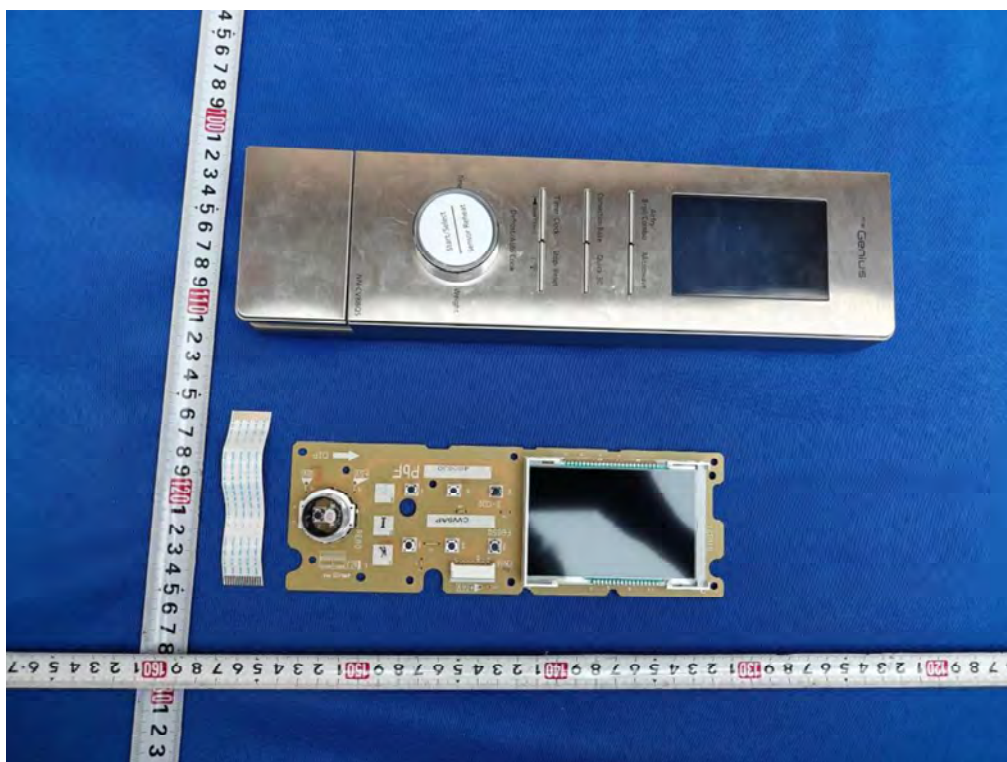


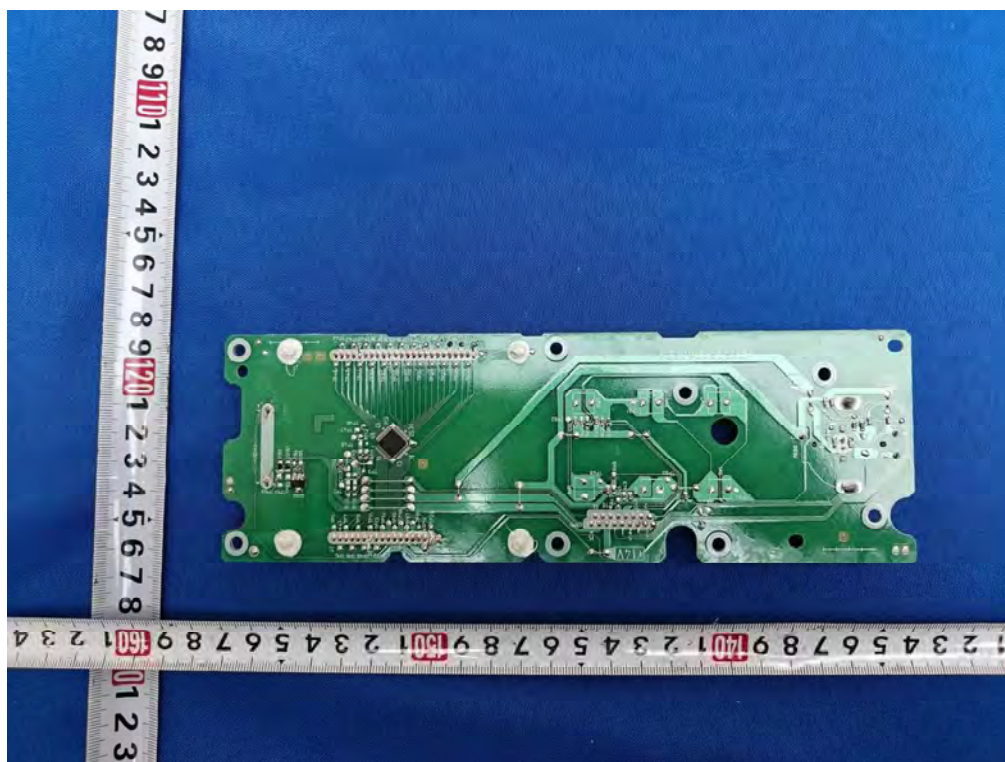












BTL Inc.(Shanghai)

DECLARATION LETTER

Applicant for:
Panasonic Corporation of North America

Add : Two Riverfront Plaza, Newark New Jersey USA, Newark,NJ07102-5490

TEL: 201-348-7558 FAX: 201-348-7758

DECLARATION


Date:10-14-2024

To:
BTL Inc.(Shanghai)
No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China
www.newbtl.com

Dear Sir or Madam:

We, **Panasonic Kitchen Appliances Technology (Jiaxing) Co., Ltd.** hereby declare
that product: Microwave Oven, model: NN-CV88QS, which has been tested by BTL.
The difference between model NN-CV88QS and NN-CV87QS, is accessory.
Please contact me if there is need for any additional clarification or information.

Best Regards,

Signature: 
Printed name: Xu Ping
Title: Engineering Manager

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