

FCC Certification



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Nemko Korea Co., Ltd.

#### **FCC PART 18 Class II Permissive Change**

#### **Applicant:**

**SAMSUNG ELECTRONICS Co., Ltd.** 

129, Samsung-ro, Yeongtong-gu Suwon-si,

Gyeonggi-do, 443-742, Korea

Attn: Ms. Jiyea Hong

Dates of Issue: January 11, 2024

Test Report No.: REP020916

Test Site: Nemko Korea Co., Ltd.

**EMC** site, Korea

FCC ID

**Trade Mark** 

**Contact Person** 

A3LOTR21M4C

SAMSUNG

SAMSUNG ELECTRONICS Co., Ltd.

129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742, Korea

Ms. Jiyea Hong

Telephone No.: + 82 31 8062 9326

Applied Standard: FCC Part 18 & Part 2

Classification: Part 18 Consumer ISM equipment

EUT Type: Microwave oven

The device bearing the Trade Mark and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in MP-5:1986.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

January 11, 2024

January 11, 2024

Tested By: Seunghyuk Yoo

**Engineer** 

Technical Manager

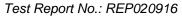
Reviewed By: Taegyun Kim





# **TABLE OF CONTENTS**

SCOPE	3
INTRODUCTION	4
ACCREDITATION AND LISTING	5
EUT INFORMATION	6
DESCRIPTION OF TESTS	7
Maximum Permissible Exposure	8







### **SCOPE**

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC part 18.

Responsible Party: SAMSUNG ELECTRONICS Co., Ltd.

Contact Person: Ms. Jiyea Hong

Tel No.: + 82 31 8062 9326

Manufacturer: SAMSUNG ELECTRONICS Co., Ltd.

129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742,

Korea

FCC ID: A3LOTR21M4C

Model: ME21DG6700SRAA

Variant Model: ME21DB670012AA, ME21DG6700MTAA

• Trade Mark: SAMSUNG

• EUT Type: Microwave oven

Applied Standard: FCC Part 18 & Part 2

Test Procedure(s): MP-5:1986

Dates of Test: December 11, 2023 to December 14, 2023

Place of Tests: Nemko Korea Co., Ltd. EMC Site

Test Report No.: REP020916



### INTRODUCTION

The measurement procedure described in MP5:1986 for Methods of Measurement of radiated, powerline conducted radio noise, frequency and power output was used in determining emissions emanating from **Samsung Electronics Co.**, **Ltd.** 

FCC ID: A3LOTR21M4C, Microwave oven.

These measurement tests were conducted at *Nemko Korea Co., Ltd. EMC Laboratory*. The site address is 155, Osan-ro, Mohyeon-eup, Cheoin-gu, Yongin-si, Gyeonggi-do 16885 Republic of Korea and 165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Republic of Korea.

The area of Nemko Korea Corporation Ltd. EMC Test Site is located in a mountain area at 80 kilometers (48 miles) southeast and Incheon International Airport (Incheon Airport), 30 kilometers (18 miles) south-southeast from central Seoul.

The Nemko Korea Co., Ltd. has been accredited as a Conformity Assessment Body (CAB).



Nemko Korea Co., Ltd.

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165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Republic of Korea.

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Fig. 1. The map above shows the Seoul in Korea vicinity area.

The map also shows Nemko Korea Corporation Ltd. EMC Lab and Incheon Airport.





## **ACCREDITATION AND LISTING**

	Accreditation number	
F©	CAB Accreditation for DOC	Designation No. KR0026
KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)		Registration No. KT155
Industry Canada IC Registered site		Site No. 2040E
VEI	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
IECEE SCHEME EMC CBTL		TL124
	KCC(RRL)Designated Lab.	Registration No. KR0026



## **EUT INFORMATION**

## **EUT Information**

Intended use	Household
Type of appliance	Over The Range
Model	ME21DG6700SRAA
Rated voltage & frequency	AC 120 V, 60 Hz Single Phase
Rated power output	1 000 W
Rated power consumption(MW)	1 700 W
Magnetron	OM-75P, manufactured by Samsung

### **Component List**

Item	Model	Manufacturer	Serial Number
MAGNETRON	OM-75P	Samsung	N/A
H.V TRANS	SHV-U1870C	DPC	N/A
H.V CAPACITOR	CH85-210091	Bicai	N/A
FAN MOTOR	SMF-U2070B	Samsung	N/A
INTERLOCK SWITCH	SZM-V16	Starion	N/A
Control	OTR_PF1_23	Samsung	N/A

## **Description of the Changes according to FCC part 2.1043**

Report No.	Difference
REP020916	1) PBA : OTR_PF1_23
	2) Noise Filter
	3) Exterior design



### **DESCRIPTION OF TESTS**

### **Radiation Hazard**

A 700  $\,\,\mathrm{m}\ell\,$  water load was placed in the center of the oven.

The power setting was set to maximum power.

While the oven was operating, the Microwave Survey Meter probe was moved slowly around the door seams to check for leakage.



## Maximum Permissible Exposure

### **RF Exposure Limit**

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the Environmental of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency	Electric Field	Magnetic Field	agnetic Field Power Density	
Range(MHz)	Strength(V/m)	Strength(A/m)	(mW/cm <sup>2</sup> )	(Minutes)
	(A) Limits for occupational / Contral Exposure			
30 - 300	61.4	0.163	1	6
300 - 1500			F/300	6
1500 - 100000			5	6
(B) Limits for General Population / Uncontrolled Exposure				
30 - 300	27.5	0.073	0.2	30
300 - 1500			F/1500	30
1500 - 100000			1	30

F = Frequency (MHz)

#### Friis formula

Friis transmission formula : Pd = (Pout \* G) / (4 \*  $\pi$ \* r<sup>2</sup>)

 $r = \sqrt{((Pout * G) / 4 * \pi * Pd))}$ 

Where

Pd = Power density in mW/cm²

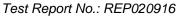
Pout = Output power to antenna in mW

G = Gain of antenna in linear scale

 $\pi$ = 3.1416

r = Distance between observation point center of the radiator in cm

Pd is the limit of MPE, <u>1 mW/cm²</u>. If we know the Maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the Maximum distance r where the MPE limit is reached and Power density at prediction frequency.





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## Maximum Permissible Exposure

#### **Test Result:**

The maximum antenna gain is **0.5 dBi or 1.12(Numeric)**.

Maximum peak output power at antenna input terminal: 18.50 (dBm)

Maximum peak output power at antenna input terminal: 70.79 (mW)

Antenna gain(Peak): 0.500 (dBi)

Maximum antenna gain: 1.12 (numeric)

Prediction distance: 20 (cm)

Prediction frequency: 2462 (MHz)

MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm^2)

Power density at prediction frequency : 0.015803 (mW/cm^2)

Test result: PASS



#### **Radiation Hazard**

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
Α	0.10	1.00
В	0.10	1.00
С	0.10	1.00
D	0.10	1.00
E	0.10	1.00
F	0.10	1.00
G	0.10	1.00
Н	0.10	1.00

### **Input Power Measurement**

Operation mode	P rated (W)	P (W)	dP (%)	Required dP (%)
Power Input	1 700	1 650	2.95	+ 15 %

### **Output Power Measurement**

Quantity of	Mass of the	Ambient	Initial	Final	Heating	Power
Water	container	temperature	temperature	temperature	time	output
[ml]	[g]	[°C]	[°C]	[℃]	[s]	[W]
1 000	420	22.5	10.0	19.8	42	963

Formula:

$$P = \frac{4.187 \times m_w \times (T_1 - T_0) + 0.55 \times m_c \times (T_1 - T_A)}{t}$$

#### **NOTE:**

P is the microwave power output (W)

 $m_{\rm w}$  is the mass of the water (g)

 $m_c$  is the mass of the container (g)

 $T_A$  is the ambient temperature ( $^{\circ}$ )

 $T_0$  is the initial temperature of the water ( $^{\circ}$ )

 $T_1$  is the final temperature of the water ( $^{\circ}$ C)

t is the heating time (s), excluding the magnetron filament heating-up time.