

Nemko Korea Co., Ltd.

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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

Tested By : Seunghyuk Yoo
Engineer

January 11, 2024

Reviewed By : Taegyun Kim
Technical Manager

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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).









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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 type		Accreditation number
	CAB Accreditation for DOC	Designation No. KR0026
	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. KT155
 Industry Canada	Canada IC Registered site	Site No. 2040E
	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
	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 ml 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 Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (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

$$\text{Friis transmission formula : } P_d = (P_{out} * G) / (4 * \pi * r^2)$$

$$r = \sqrt{((P_{out} * G) / 4 * \pi * P_d)}$$

Where

P_d = Power density in mW/cm²

P_{out} = Output power to antenna in mW

G = Gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.

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/cm²)

Power density at prediction frequency : 0.015803 (mW/cm²)

Test result: PASS

Radiation Hazard

Probe Location	Maximum Leakage [mW/Cm2]	Limit [mW/Cm2]
A	0.10	1.00
B	0.10	1.00
C	0.10	1.00
D	0.10	1.00
E	0.10	1.00
F	0.10	1.00
G	0.10	1.00
H	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 Water [ml]	Mass of the container [g]	Ambient temperature [°C]	Initial temperature [°C]	Final temperature [°C]	Heating time [s]	Power output [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_w is the mass of the water (g)

m_c is the mass of the container (g)

T_A is the ambient temperature (°C)

T₀ is the initial temperature of the water (°C)

T₁ is the final temperature of the water (°C)

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

- END -