RF Exposure Evaluation Document

For
WPT (Wireless Power Transfer)

FCC ID: A3LSMN770F
Model Name: SM-N770F/DS, SM-N770F

Report Number: 13094578-E11V2
Issue Date: 12/2/2019

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
V1	11/18/2019	Initial Issue	--
V2	12/2/2019	Update per TCB Reviewer comments: Model Names	Lance Fleischer

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1. Attestation of Test Results

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU,
SUWON-SI, GYEONGGI-DO, 16677, KOREA.

EUT DESCRIPTION: WPT (Wireless Power Transfer)

MODEL NUMBER: SM-N770F/DS, SM-N770F

SERIAL NUMBER: R38MA039QFA

DATE TESTED: November 8, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 1 SUBPART I & PART 2 SUBPART J	Complies

UL Verification Services Inc. calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released By:	Prepared By:
	
Dave Weaver Operations Leader UL Verification Services Inc.	Lance Fleischer Laboratory Engineer UL Verification Services Inc.

2. Test Specification, Methods and Procedures

Tested in accordance with FCC Guidance

3. Test Equipment

The following test and measurement equipment was used for the tests documented in this report:

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Electric and Magnetic Field Analyzer	narda	EHP-200A	170WX90219	9/20/2020

4. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA.

5. Equipment Under Test

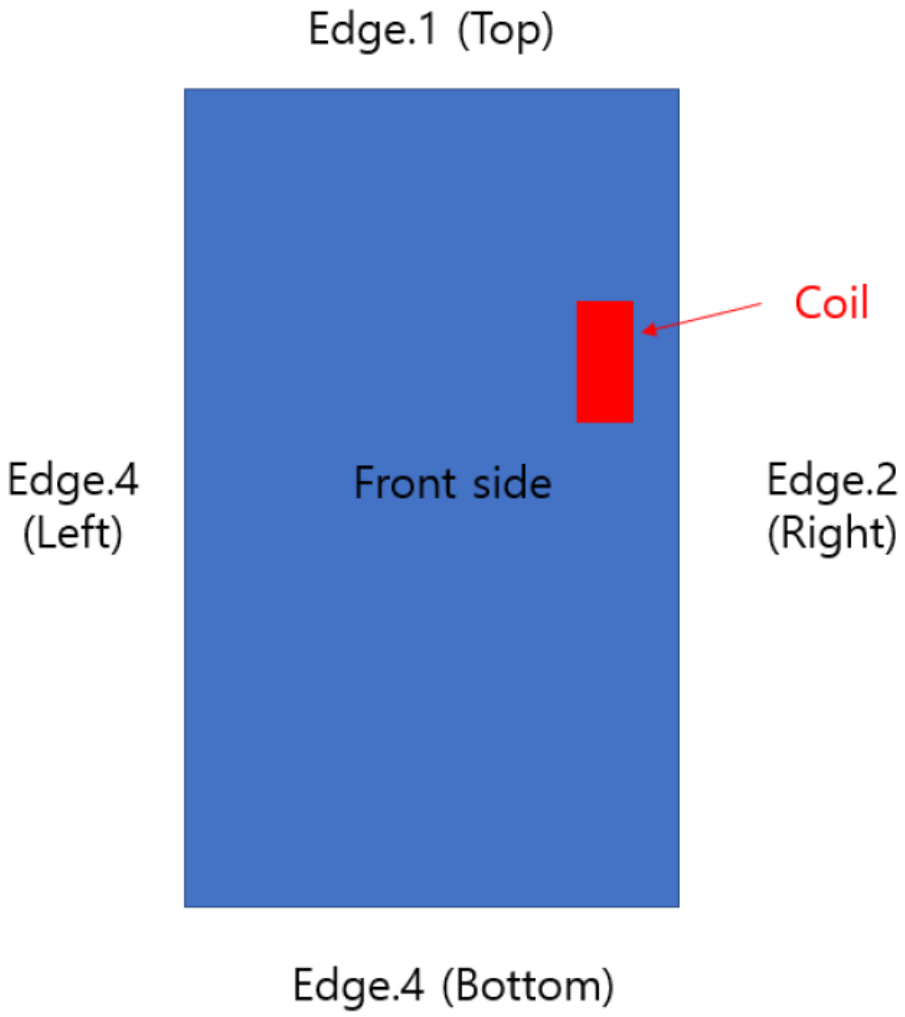
DUT Information	
Model used for testing	SM-N770F/DS
Operating Frequency (kHz)	593 - 625
Maximum Output Power (mW)	40
Charging Type	Inductive Wireless Power Transfer
Operating Duty Factor	0.064

Duty Factor Determined by the following:
1min + 4s every 2mins
(Charging time : 1min (0% up to 100%)
And 4s Tx in every 2mins after finishing charging)

Factor : 1min + 14*4 = 1min 56s
30min factor : 1min 56s / 30m = 0.064

6. Description of Test Setup

EUT was measured on all 6 sides at 0mm to determine the worst case test position.



7. Measurement Results

7.1. H-Field Measurements

Distance	H-Field Measurements (A/m)					
	Rear	Front	Edge 1	Edge 2	Edge 3	Edge 4
0 cm	0.621	0.213	0.054	0.288	0.037	0.042

7.2. H-Field Measurements for Worst Case Test Position (Rear)

Distance	H-Field Measurements (A/m)	H-Field x (Duty Factor) (A/m)	FCC Limit (A/m)
0 cm	0.621	**0.040**	1.630
1 cm	0.275	0.018	
2 cm	0.147	0.009	
3 cm	0.086	0.005	
4 cm	0.054	0.003	
5 cm	0.045	0.003	
6 cm	0.039	0.002	
7 cm	0.033	0.002	
8 cm	0.034	0.002	
9 cm	0.033	0.002	
10 cm	0.033	0.002	
No Device	0.033	0.002	

7.3. Corrected H-Field Measurement

Operating duty factor is based on Averaging Time of §1.1310 table 1.

- 0.621 A/m * 0.064 = **0.040 A/m**

8. MAXIMUM PERMISSIBLE RF EXPOSURE

8.1. FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—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/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*($900/f^2$)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*($180/f^2$)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

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

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.