

WPC RF Exposure Report

Applicant Name:

SAMSUNG Electronics Co., Ltd.

129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea

Date of Issue: Oct. 05, 2023

Test Report No.: HCT-SR-2310-FC001

Test Site: HCT CO., LTD.

FCC ID:

A3LSMS926U

Equipment Type:

Mobile Phone

Application Type

Certification

FCC Rule Part(s):

**FCC Part 1 SUBPART I
FCC Part 2 SUBPART J
KDB 680106 D01**

Model Name:

SM-S926U

Additional Model Name:

SM-S926U1

Date of Test:

Sep. 26, 2023

This device has been shown to be capable of compliance for the above standards for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

I attest to the accuracy of data. 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.

Tested By



**Dong-Seon, Kim
Test Engineer
SAR Team
Certification Division**

Reviewed By



**Yun-jeang, Heo
Technical Manager
SAR Team
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DOCUMENT HISTORY

Rev.	DATE	DESCRIPTION
0	Oct. 05, 2023	First Approval Report

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1. Test Methodology

The DUT was assessed in accordance with FCC KDB 680106 D01 RF Exposure Wireless Charging App v03r01.

2. Test Location.

2.1 Test Laboratory.

Company Name:	HCT Co., LTD
Address:	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of Korea
Telephone:	+82 31 645 6300
Fax.:	+82 31 645 6401

2.2 Test Facilities

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Korea:	National Radio Research Agency (Designation No. KR0032)
	KOLAS (Testing No. KT197)

3. DEVICE UNDER TEST DESCRIPTION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Model Name:	SM-S926U
Multi-Model Name:	SM-S926U1
EUT Type:	Mobile Phone
Application Type:	Certification

3.1 Description of DUT

The DUT is a mobile phone with a WPT (Wireless Power Transfer) feature using an inductive charging coil to charge a phone and a watch. The charging frequency is between 110 kHz to 148 kHz, and the maximum transfer power consumption is 9 W in charging status.

3.2 Test Configurations

Test configurations	Description
DUT to Phone test configuration 1	Charging from Phone to DUT
DUT to Phone test configuration 2	Charging from Phone to DUT(TA Charging from DUT)
DUT to Phone test configuration 3	Charging from Phone to DUT
DUT to Phone test configuration 4	Charging from Phone to DUT(TA Charging from DUT)
DUT to Phone test configuration 5	Charging from Watch to DUT
DUT to Phone test configuration 6	Charging from Watch to DUT(TA Charging from DUT)
DUT to Phone test configuration 7	Charging from Ear buds to DUT
DUT to Phone test configuration 8	Charging from Ear buds to DUT(TA Charging from DUT)

Note :

1. Configuration 2,4,6 and 8 were tested with the worst case of configuration 1,3,5 and 7

3.3 KDB 680106 D01 v03 SECTION 5.b) EQUIPMENT APPROVAL CONSIDERATIONS

Requirement	Device
(1) Power transfer frequency is less than 1 MHz.	Yes. Operation Frequency is between 110 kHz to 148 Khz.
(2) Output power from each primary coil is less than or equal to 15 watts.	Yes. Maximum power is 9 Watts.
(3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and client that are able to detect and allow coupling only between individual pairs of coils	Yes.
(4) Client device is placed directly in contact with the transmitter.	Yes.
(5) Mobile exposure conditions only(portable exposure conditions are not covered by this exclusion).	Yes.
(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.	Yes. The aggregate field strengths at 20 cm from the device is 3.5 % of the FCC H field limit.

3.4 DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS

SUPPORT EQUIPMENT & PERIPHERALS LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Watch	SAMSUNG Electronics Co., Ltd.	SM-R835F	RFAN60CVTVJ	A3LSMR835
Ear Buds	SAMSUNG Electronics Co., Ltd.	SM-R180	A2011103347	A3LSMR180L A3LSMR180R
Phone	SAMSUNG Electronics Co., Ltd.	SM-G986B/DS	R5CN101A0JM	A3LSMG986B

TEST SETUP

The following three modes are tested in test configuration;

All Position of client device were investigated and the worst position results are reported.

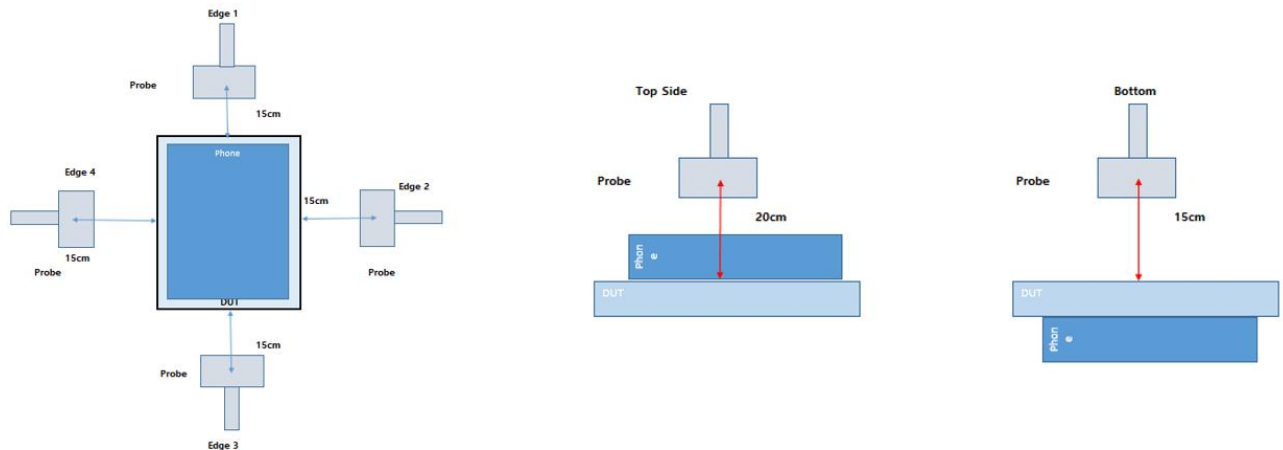
Mode
Operating (SUPPORT Equipment, <10% Power Charging)
Operating (SUPPORT Equipment, 50~55% Power Charging)
Operating (SUPPORT Equipment, 90~95% Power Charging)

MEASUREMENT TEST SETUP

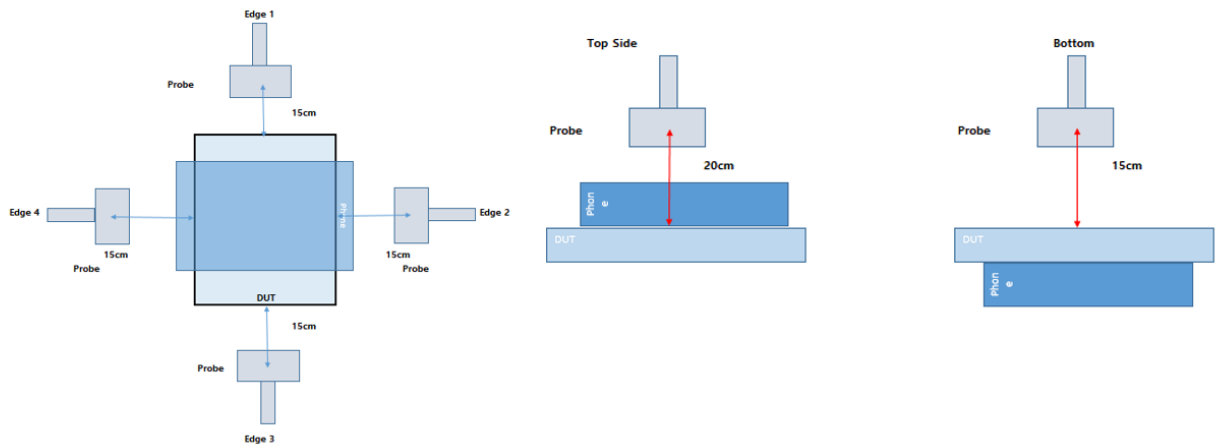
The measurement was taken using a probe place 15 cm from the edges of DUT or 20 cm above the DUT. Measurement were from the top and all sides of the DUT per KDB680106 D01 v03. Additionally, as the DUT to phone configuration could result with the DUT place either above or below the phone, measurements were performed 'below' the DUT by flipping the DUT/phone so that the DUT was uppermost.

The probe was moved along the edges or above the DUT to a position that showed the maximum field strength. This position was used for the reported result.

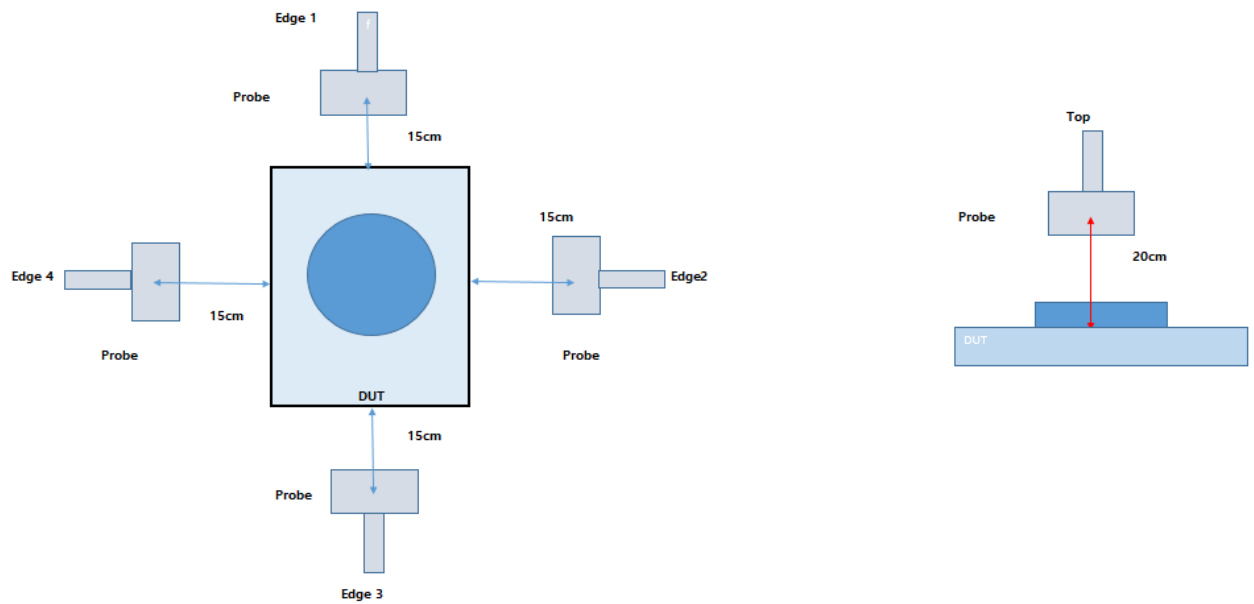
DUT to phone test Configuration 1 & 2



DUT to phone test Configuration 3 & 4



DUT to Watch/Ear buds test Configuration 5 & 6 and 7 & 8



4. TEST AND MEASUREMENT EQUIPMENT

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

Manufacturer	Model name	Description	S/N	Calib. Date	Calib.Due
Narda	EHP 200AC	Electric and Magnetic Field Probe	170WX91009	07/29/2022	07/29/2024

5. MAXIMUM PERMISSIBLE RF EXPOSURE

1.13010 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.

6. TEST RESULTS

H-Field Measurements

Note : peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS value: [Field Strength * $\sqrt{\text{Duty Cycle}}$]

TEST results of DUT to phone test Configuration 1&2

FCC RF Exposure Result					
Test Configuration	Test mode	Test distance	Test Position	H-Field Limit (A/m)	H-Field meas data (A/m)
Configuration 1	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.047
		15 cm	Bottom		0.044
			Edge 1		0.045
			Edge 2		0.044
			Edge 3		0.042
			Edge 4		0.042
	Operation Real Product (Power 50~55% charging)	20 cm	Top	1.63	0.048
		15 cm	Bottom		0.042
			Edge 1		0.046
			Edge 2		0.047
			Edge 3		0.047
	Operation Real Product (Power 90~95% charging)	15 cm	Edge 4		0.041
			Top	1.63	0.046
			Bottom		0.043
			Edge 1		0.043
			Edge 2		0.042
			Edge 3		0.043
			Edge 4		0.044
Configuration 2	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.057

TEST results of DUT to phone test Configuration 3&4

FCC RF Exposure Result					
Test Configuration	Test mode	Test distance	Test Position	H-Field Limit (A/m)	H-Field meas data (A/m)
Configuration 3	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.053
		15 cm	Bottom		0.046
			Edge 1		0.047
			Edge 2		0.046
			Edge 3		0.045
			Edge 4		0.047
	Operation Real Product (Power 50~55% charging)	20 cm	Top	1.63	0.045
		15 cm	Bottom		0.042
			Edge 1		0.048
			Edge 2		0.046
			Edge 3		0.044
			Edge 4		0.046
	Operation Real Product (Power 90~95% charging)	20 cm	Top	1.63	0.051
		15 cm	Bottom		0.041
			Edge 1		0.047
			Edge 2		0.047
			Edge 3		0.042
			Edge 4		0.044
Configuration 4	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.047

TEST results of DUT to Watch test Configuration 5&6

FCC RF Exposure Result					
Test Configuration	Test mode	Test distance	Test Position	H-Field Limit (A/m)	H-Field meas data (A/m)
Configuration 5	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.048
		15 cm	Edge 1		0.044
			Edge 2		0.047
			Edge 3		0.047
			Edge 4		0.045
	Operation Real Product (Power 50~55% charging)	20 cm	Top	1.63	0.043
		15 cm	Edge 1		0.045
			Edge 2		0.043
			Edge 3		0.047
			Edge 4		0.044
	Operation Real Product (Power 90~95% charging)	20 cm	Top	1.63	0.047
		15 cm	Edge 1		0.046
			Edge 2		0.045
			Edge 3		0.049
			Edge 4		0.045
Configuration 6	Operation Real Product (Power <10% charging)	15 cm	Edge 3	1.63	0.048

TEST results of DUT to Ear Buds test Configuration 7&8

FCC RF Exposure Result					
Test Configuration	Test mode	Test distance	Test Position	H-Field Limit (A/m)	H-Field meas data (A/m)
Configuration 7	Operation Real Product (Power <10% charging)	20 cm	Top	1.63	0.047
		15 cm	Edge 1		0.046
			Edge 2		0.046
			Edge 3		0.047
			Edge 4		0.047
	Operation Real Product (Power 50~55% charging)	20 cm	Top	1.63	0.044
		15 cm	Edge 1		0.045
			Edge 2		0.049
			Edge 3		0.051
			Edge 4		0.049
	Operation Real Product (Power 90~95% charging)	20 cm	Top	1.63	0.045
		15 cm	Edge 1		0.042
			Edge 2		0.047
			Edge 3		0.049
			Edge 4		0.047
Configuration 8	Operation Real Product (Power <10% charging)	15 cm	Edge 3	1.63	0.045

7. Conclusion

	H-Field (A/m)
MPE Limit	1.63
Maximum Measurement Result	0.057
Percentage (%)	3.50

H-Field test result was less than 50% of MPE Limit