

Report No.: GZCR210802079303

Page: 1 of 14 FCC ID: ZCAEPH5300

TEST REPORT

Application No.: GZCR2108020793AT

Applicant: Samsung Electronics Co., Ltd.

Address of Applicant: 19 Chapin Rd., Building D Pine Brook, NJ 07058

Manufacturer: Jiangxi Lineprinting Co., Ltd

Address of Manufacturer: No.268, Nantang Road, Jinggangshan Economic Development Zone, Ji'an,

China

Factory: Jiangxi Lineprinting Co., Ltd

Address of Factory: No.268, Nantang Road, Jinggangshan Economic Development Zone, Ji'an,

China

Equipment Under Test (EUT):

EUT Name: Wireless Car Charger

Model No.: EP-H5300 Trade Mark: samsung

Standard(s): 47 CFR Part 1.1310

47 CFR Part 1.1307

KDB 680106 D01

 Date of Receipt:
 2021-08-20

 Date of Test:
 2021-09-06

 Date of Issue:
 2021-09-07

Test Result: Pass*

Kobe Jian EMC Laboratory Manager



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^{*} In the configuration tested, the EUT complied with the standards specified above.



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Revision Record							
Version	Chapter	Chapter Date Modifier Remark		Remark			
01		2021-09-07		Original			

Authorized for issue by:			
	Kevin Zhang		
	Kevin Zhang/Project Engineer	-	
	Riday Lin		
	Ricky Liu/Reviewer	-	



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2 Test Summary

Radio Spectrum Matter Part								
Item	Standard	Method	Requirement	Result				
RF Exposure Evaluation	47 CFR Part 1.1310	KDB 680106 D01	47 CFR Part 1.1310 & KDB 680106 D01	Pass				

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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General Information

4.1 Details of E.U.T.

Power supply: DC 5V, 2A/9V, 1.67 A powered by car charger as below:

> Model: EP-L5300 Input: DC 12V-24V

Output:

(PDO) DC 5.0 V, 3.0A/DC 9.0 V, 3.0 A/DC 15.0 V/DC 20.0 V, 2.25A

(PPS) DC 3.3-20.0 V, 2.25A

(USBA) DC 5.0 V, 2.0A/DC 9.0 V, 1.67 A

Type C input ports Cable(s):

Test Voltage: AC 120 V, 60 Hz powered by DC power adapter to section 4.2

Operation Frequency: 120kHz to 130 kHz Modulation Type: Load modulation Antenna Type: Loop antenna

Number of Antenna: 2 but only 1 antenna is enabling during changing

Software Version:

Hardware Version: TAM5-TX-PCB-REV.A2

Sample NO.: Α1

Power Setting: Default can not changed by user Function: Wireless Car Charger for vehicle use

4.2 Description of Support Units

Description	Description Manufacturer		Serial No.
Resistor with changing loop antenna Offered by applicant		1	/
Mobile Phone	SAMSUNG	GT-19500	RV1D82X8W9X
DC Power Supply	GWINSTEK	GPS-3030DD (Input: AC100-240V, 50/60Hz;Output: DC Max.30V, 3A)	EMC0008

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
RF Exposure Evaluation	MF:U=0.13dB,EF:U=0.4dB

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory, 198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

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No tests were sub-contracted.



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4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• NVLAP (Lab Code: 200611-0)

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

• CNAS (Lab Code: L0167)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

• ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

• VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

• CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

RF Exposure Evaluation									
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date				
743 Compact 3m Semi- Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2019-10-20	2022-10-19				
Electric and Magnetic Field Analyzer	Narada	NBM-550	EMC2143	2020-01-07	2022-01-06				
Probe	Narada	EHP-50F	EMC2143	2020-01-07	2022-01-06				

General used equipment									
Equipment	Manufacturer	Model No	Inventory No Cal Date		Cal Due Date				
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05				
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05				



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6 Radio Spectrum Matter Test Results

6.1 RF Exposure Evaluation

Test Requirement 47 CFR Part 1.1310 & KDB 680106 D01

Test Method: KDB 680106 D01

Limit:

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in Part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)					
(A) Limits for Occupational/Controlled Exposure									
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					
300-1,500			f/300	6					
1,500-100,000			5	6					
(E	B) Limits for Gener	al Population/Uncor	ntrolled Exposure						
0.3-1.34	614	1.63	*100	30					
1.34-30	824/f	2.19/f	*180/f ²	30					
30-300	27.5	0.073	0.2	30					
300-1,500			f/1500	30					
1,500-100,000			1.0	30					

f = frequency in MHz

According to IEEE C95.3:2002 section 5.5.1.1, The power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula

$$S = \frac{PG}{A-A^2}$$

$$S = power density (mW/cm^2)$$

$$P = the net power delivered to the antenna (mW)$$

$$G = gain of the antenna in linear scale$$

d = distance between observation point and center of the radiator (cm)

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 56 % RH Atmospheric Pressure: 1008 mbar



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^{* =} Plane-wave equivalent power density



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6.1.2 Test Mode Description

Mode Pre-scan / **Description** Final test Code

This device has been tested the artificial load of full load, half load & Final test 02

unload, and the device has been tested with mobile phone at zero charge,

intermediate charge, and full charge.

Changing will take place when the charger is in contact with a phone only, no space is

reserved/ designed for air because the structure of the EUT will automatically fix the Remark:

device being charged closely.

6.1.3 Measurement Procedure and Data

This device has been tested the worst status of full load and horizontal placement, vertical placement had been tested and only the worst vertical placement had been recorded in the report. The device has been tested with mobile phone at zero charge, intermediate charge, and full charge and all transmitters, including those not used for wireless power transfer, have been active simultaneously and at maximum power.

Output Voltage= DC 5 V; The max output power = 10 W; Calculation of resistor value=2.5 Ω **Magnetic Field Emissions**

Operation	Test Distance	Test	Probe Measure Result (A/m)		50 0/ 1 to 14		10 % Limit
frequency	(cm)	Position	unload	Half load	full load	(A/m)	(A/m)
129.26kHz	6*	Side 1	0.359	0.556	0.618	0.815	0.163
which is the worst case		Side 2	0.340	0.546	0.609		
within the		Side 3	0.361	0.559	0.622		
operation frequency range		Side 4	0.348	0.541	0.618		
		Тор	0.304	0.544	0.598		

Magnetic Field Emissions

Operation	Test Distance	Test	Probe Measure Result (A/m)			50 % Limit	10 % Limit
frequency	(cm)	Position	unload	Half load	full load	(A/m)	(A/m)
129.26kHz	8	Side 1	0.324	0.472	0.594	0.815	0.163
which is the worst case		Side 2	0.248	0.469	0.562		
within the		Side 3	0.328	0.478	0.597		
operation frequency range		Side 4	0.242	0.470	0.553		
		Тор	0.245	0.421	0.536		



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Magnetic Field Emissions

Operation	Test Distance	Distance Test		Probe Measure Result (A/m)			10 % Limit
frequency	(cm)	Position	unload	Half load	full load	(A/m)	(A/m)
129.26kHz	10 Side Side	Side 1	0.304	0.453	0.528	0.815	0.163
which is the worst case		Side 2	0.226	0.425	0.509		
within the		Side 3	0.308	0.449	0.525		
operation frequency range		Side 4	0.224	0.403	0.505		
		Тор	0.213	0.398	0.464		

Magnetic Field Emissions

Operation	Test Distance	Test	Probe Measure (A/m) unload Half load 0.258 0.392		Result	50 % Limit	10 % Limit
frequency	(cm)	Position	unload		full load	(A/m)	(A/m)
129.26kHz		Side 1	0.258	0.392	0.487		
which is the worst case		Side 2	0.194	0.363	0.428		
within the	15	Side 3	0.261	0.378	0.475	0.815	0.163
operation frequency		Side 4	0.197	0.357	0.405		
range		Тор	0.158	0.315	0.376		

Mobile phone has been charge zero charge, intermediate charge and full charge. Magnetic Field Emissions

Operation frequency	Test Distance (cm)	Test Position	Probe	e Measure Resu	50 %	10 %	
			zero charge	intermediate charge	full charge	Limit (A/m)	Limit (A/m)
129.26kHz which is the worst case within the operation frequency range		Side 1	0.662	0.643	0.589	0.815	0.163
		Side 2	0.586	0.577	0.537		
	6	Side 3	0.658	0.644	0.593		
		Side 4	0.576	0.566	0.527		
		Тор	0.450	0.438	0.426		



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Magnetic Field Emissions

	Test	Test	Probe N	leasure Res	50 %	10 %		
Operation frequency	Distance (cm)	Positio	zero charge	intermedi ate charge	full charge	Limit (A/m)	Limit (A/m)	
129.26kHz		Side 1	0.621	0.615	0.575			
which is the worst case		Side 2	0.547	0.532	0.514			
within the	8	Side 3	0.615	0.609	0.566	0.815	0.163	
operation frequency		Side 4	0.555	0.523	0.516			
range		Тор	0.425	0.407	0.396			

Magnetic Field Emissions

Operation frequency (cm)	Test		Probe M	leasure Res	50 %	10 %	
	Distance	Test Position	zero charge	intermedi ate charge	full charge	Limit (A/m)	Limit (A/m)
129.26kHz		Side 1	0.591	0.580	0.569		
which is the worst case		Side 2	0.526	0.503	0.491		
within the	10	Side 3	0.584	0.572	0.558	0.815	0.163
operation frequency		Side 4	0.510	0.495	0.479		
range	Тор	0.402	0.384	0.371			

Magnetic Field Emissions

Operation frequency	Test	Test	Probe N	leasure Res	50 %	10 %	
	Distance (cm)	Positio n	zero charg e	intermed iate charge	full charg e	Limit (A/m)	Limit (A/m)
129.26kHz which is the worst case within the operation frequency range		Side 1	0.364	0.347	0.327		0.163
		Side 2	0.350	0.339	0.318		
	15	Side 3	0.362	0.349	0.322	0.815	
		Side 4	0.349	0.335	0.314		
		Тор	0.294	0.272	0.258		



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Verifying the probe angles effect to the result:

Magnetic Field Emissions for the worst case of above for different measurement distance of probe isotropy and rotating the probe through various angles

Operation Test Position		Test Distance	Test	Pro	be Measure R (A/m)	50 % Limit	10 % Limit	
	Position	(cm)	angles	zero charge	intermediate charge	full charge	(A/m)	(A/m)
		15	0°	0.364	0.347	0.327		0.163
			0°	0.591	0.580	0.569		
			+45° -H	0.553	0.541	0.531		
			-45° -H	0.555	0.548	0.537		
		10	+45° -V	0.554	0.546	0.536		
			-45° -V	0.553	0.544	0.531	0.815	
			+45° -R	0.542	0.543	0.534		
			-45° -R	0.547	0.546	0.532		
400 00111		4	0°	0.621	0.615	0.575		
129.26kHz which is the			+45° -H	0.619	0.597	0.467		
worst case within the	Side 1		-45° -H	0.618	0.598	0.461		
operation	Side i	8	+45° -V	0.609	0.596	0.451		
frequency range			-45° -V	0.619	0.586	0.465		
range			+45° -R	0.610	0.593	0.471		
			-45° -R	0.617	0.590	0.469		
			0°	0.662	0.643	0.589		
			+45° -H	0.654	0.632	0.562		
			-45° -H	0.659	0.631	0.567		
		6*	+45° -V	0.654	0.619	0.562		
			-45° -V	0.656	0.618	0.569		
			+45° -R	0.652	0.624	0.575		
			-45° -R	0.657	0.622	0.571		

Remark: H: Horizontal; V: Vertical; R: Rotating with the axis of the probe.



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^{*} Remark: 6cm is the least distance between the center of the probe and the edge of EUT.



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7 Test Setup Photo

Refer to Appendix - Test Setup Photos for GZCR210802079303



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8 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2108020793AT

- End of the Report -



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