

RF EXPOSURE REPORT



FCC Applicant: Aptiv Connection Systems India Pvt Ltd
7/60-A & 60-B, Arakunnam Pulickamaly Road; Arakunnam
P.O., Ernakula, Kerala, India

FCC Manufacturer: Aptiv Connection Systems India Pvt Ltd
7/60-A & 60-B, Arakunnam Pulickamaly Road; Arakunnam
P.O., Ernakula, Kerala, India

Product Name: Wireless Charger

Brand Name: APTIV

Model No.: 35487240

FCC ID 2A9QJ-35487240

Issue Date: Feb. 03, 2023

Date of Test: Dec. 09, 2022

Date of EUT Received: Dec. 09, 2022

Approved By

John Teh

John Yeh

We hereby certify that:

The above equipment was verified by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091.

The results of this report relate only to the sample identified in this report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2211000520E5	00	Original.	Dec. 12, 2022	Ruby Ou	*
TESA2211000520E5	01	Modify comment	Dec. 30, 2022	Kimmy Chiou	*
TESA2211000520E5	02	Modify comment	Jan. 19, 2023	Kimmy Chiou	*
TESA2211000520E5	03	Modify comment	Feb. 03, 2023	Kimmy Chiou	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	Wireless Charger
Brand Name:	APTIV
Model No.:	35487240

1.2 RF Specification

Technology:	Wireless Power Transfer
TX Frequency Range	110 kHz ~ 205 kHz
FCC Transmit Power	< 8.19dBuV/m at 300m.
Number of Channels	1
Antenna Type	Loop

Note: Antenna information is provided by the applicant.

1.3 Test Facility

Laboratory	Test Site Address		FCC Designation number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	<input type="checkbox"/>	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	TW0027
	<input checked="" type="checkbox"/>	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	TW0028
	<input type="checkbox"/>	1F, No.8, Alley 15, Lane 120, Sec. 1, Nei Hu Road	TW0029

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2 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 Standard Applicable

According to KDB 680106 D01 RF Exposure Wireless Charging App v03

RF exposure potential to users and bystanders is expected to vary according to factors inherent to the design of individual systems, which generally requires different evaluation considerations to show compliance.

When exposure concerns arise; for example, due to evolving products and operations, RF exposure evaluation may be requested under the provisions of Sections 1.1307 (c) and (d) to determine compliance. Because of significant variations in design and operating characteristics, the procedures required to evaluate RF exposure compliance for wireless power transfer are considered according to the exposure potentials of individual implementations

The RF exposure requirements must be determined in conjunction with the device operating characteristics, according to the mobile and portable exposure requirements in Sections 2.1091 and 2.1093 of the rules. SAR and MPE limits do not cover the frequency range for wireless power transfer applications which operate below 100 kHz and 300 kHz respectively; therefore, RF exposure compliance needs to be determined with respect to Sections 1.1307 (c) and (d) of the FCC rules.

2.2 Limits for Maximum Permissible Exposure (MPE)

Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

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 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
(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
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 * = Plane-wave equivalent power density

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2.3 The Worst Charging Condition:

Ancillary Equipment	Charging Condition	Verdict
Load	Full Loading	PASS
Load	99% Loading	PASS
Load	50% Loading	PASS
Load	1% Loading	PASS
Note: For Wireless Power Consortium Qi specification, a lower operating frequency or high duty cycle result in the transfer of a higher amount of power and charging current.		

2.4 Measurement Procedure:

Per FCC guidance, the use condition for this device (wireless charger) is mobile condition. For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m.

2.5 Measurement Equipment Used:

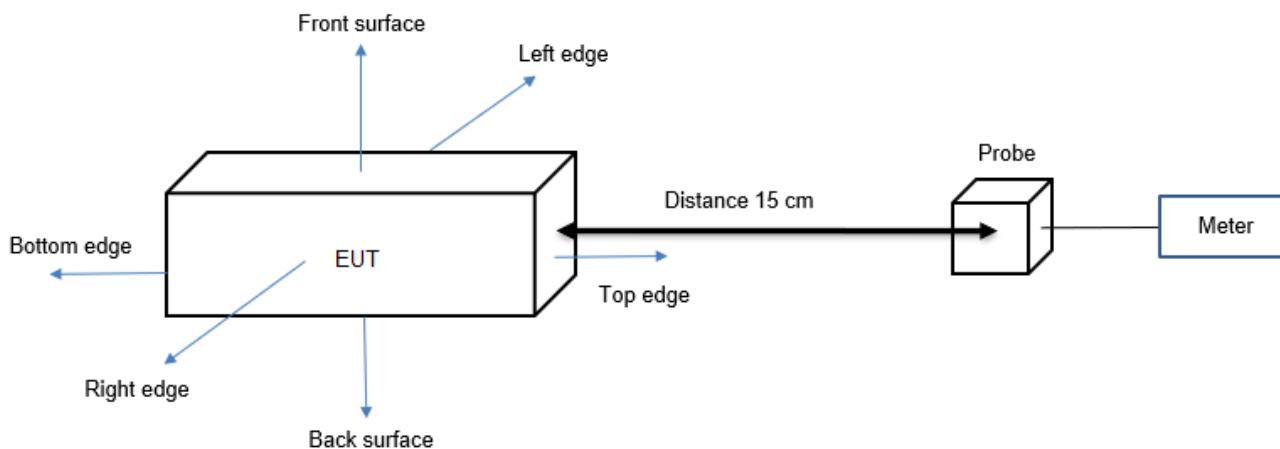
SAR Test Site:					
Manufacturer	Device	Type	Serial number	Date of last calibration	Date of next calibration
Narda	EHP-200AC	3 kHz~30 MHz	180ZX00635	Mar/10/2022	Mar/09/2023
Narda	Software	EHP-200 TS 1.94 28/08/2020	N/A	Calibration not required	Calibration not required

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2.6 Test Set-up:



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2.7 Maximum Permissible Exposure (MPE) Evaluation:

Maximum Permissible Exposure for L3								
Loading %	Test position	Test Distance	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Pass / Fail	H-Field Strength (A/m)	H-Field Strength Limit (A/m)	Pass / Fail
Full	Front	15 cm	0.7329	614	Pass	0.4487	1.63	Pass
	Back	15 cm	0.2851	614	Pass	0.2510	1.63	Pass
	Left	15 cm	0.7889	614	Pass	0.2658	1.63	Pass
	Right	15 cm	0.6972	614	Pass	0.4658	1.63	Pass
	Top	15 cm	1.7848	614	Pass	0.6183	1.63	Pass
	Bottom	15 cm	0.5902	614	Pass	0.3539	1.63	Pass
99	Front	15 cm	0.696	614	Pass	0.4280	1.63	Pass
	Back	15 cm	0.2778	614	Pass	0.2241	1.63	Pass
	Left	15 cm	0.7531	614	Pass	0.2277	1.63	Pass
	Right	15 cm	0.6574	614	Pass	0.4412	1.63	Pass
	Top	15 cm	1.7764	614	Pass	0.5756	1.63	Pass
	Bottom	15 cm	0.5828	614	Pass	0.3537	1.63	Pass
50	Front	15 cm	0.6913	614	Pass	0.4153	1.63	Pass
	Back	15 cm	0.2722	614	Pass	0.2453	1.63	Pass
	Left	15 cm	0.7514	614	Pass	0.2500	1.63	Pass
	Right	15 cm	0.6592	614	Pass	0.4246	1.63	Pass
	Top	15 cm	1.7722	614	Pass	0.6118	1.63	Pass
	Bottom	15 cm	0.5406	614	Pass	0.3103	1.63	Pass
1	Front	15 cm	0.7298	614	Pass	0.4436	1.63	Pass
	Back	15 cm	0.2674	614	Pass	0.2124	1.63	Pass
	Left	15 cm	0.7735	614	Pass	0.2185	1.63	Pass
	Right	15 cm	0.6842	614	Pass	0.4424	1.63	Pass
	Top	15 cm	1.7837	614	Pass	0.6113	1.63	Pass
	Bottom	15 cm	0.5534	614	Pass	0.3289	1.63	Pass

Maximum Permissible Exposure for L1								
Loading %	Test position	Test Distance	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Pass / Fail	H-Field Strength (A/m)	H-Field Strength Limit (A/m)	Pass / Fail
Full	Front	15 cm	0.6725	614	Pass	0.4191	1.63	Pass
	Back	15 cm	0.1901	614	Pass	0.2154	1.63	Pass
	Left	15 cm	0.6801	614	Pass	0.2542	1.63	Pass
	Right	15 cm	0.6175	614	Pass	0.4422	1.63	Pass
	Top	15 cm	1.7295	614	Pass	0.5919	1.63	Pass
	Bottom	15 cm	0.4563	614	Pass	0.3295	1.63	Pass
99	Front	15 cm	0.5095	614	Pass	0.3874	1.63	Pass
	Back	15 cm	0.1566	614	Pass	0.1835	1.63	Pass
	Left	15 cm	0.7229	614	Pass	0.2135	1.63	Pass
	Right	15 cm	0.5399	614	Pass	0.4031	1.63	Pass
	Top	15 cm	1.5991	614	Pass	0.5472	1.63	Pass
	Bottom	15 cm	0.4204	614	Pass	0.3252	1.63	Pass
50	Front	15 cm	0.5223	614	Pass	0.3875	1.63	Pass
	Back	15 cm	0.0872	614	Pass	0.2237	1.63	Pass
	Left	15 cm	0.6854	614	Pass	0.2311	1.63	Pass
	Right	15 cm	0.571	614	Pass	0.3951	1.63	Pass
	Top	15 cm	1.6941	614	Pass	0.5855	1.63	Pass
	Bottom	15 cm	0.3561	614	Pass	0.3091	1.63	Pass
1	Front	15 cm	0.5931	614	Pass	0.4292	1.63	Pass
	Back	15 cm	0.1995	614	Pass	0.1877	1.63	Pass
	Left	15 cm	0.5799	614	Pass	0.2066	1.63	Pass
	Right	15 cm	0.4923	614	Pass	0.4104	1.63	Pass
	Top	15 cm	1.6014	614	Pass	0.5874	1.63	Pass
	Bottom	15 cm	0.4856	614	Pass	0.3066	1.63	Pass

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Maximum Permissible Exposure for L2								
Loading %	Test position	Test Distance	E-Field Strength (V/m)	E-Field Strength Limit (V/m)	Pass / Fail	H-Field Strength (A/m)	H-Field Strength Limit (A/m)	Pass / Fail
Full	Front	15 cm	0.7117	614	Pass	0.4057	1.63	Pass
	Back	15 cm	0.1976	614	Pass	0.2342	1.63	Pass
	Left	15 cm	0.616	614	Pass	0.2656	1.63	Pass
	Right	15 cm	0.5476	614	Pass	0.4174	1.63	Pass
	Top	15 cm	1.7577	614	Pass	0.6006	1.63	Pass
	Bottom	15 cm	0.5178	614	Pass	0.3455	1.63	Pass
99	Front	15 cm	0.5975	614	Pass	0.4235	1.63	Pass
	Back	15 cm	0.2764	614	Pass	0.1756	1.63	Pass
	Left	15 cm	0.6864	614	Pass	0.1789	1.63	Pass
	Right	15 cm	0.5923	614	Pass	0.4026	1.63	Pass
	Top	15 cm	1.6399	614	Pass	0.5573	1.63	Pass
	Bottom	15 cm	0.5096	614	Pass	0.3105	1.63	Pass
50	Front	15 cm	0.6275	614	Pass	0.3671	1.63	Pass
	Back	15 cm	0.118	614	Pass	0.2237	1.63	Pass
	Left	15 cm	0.5922	614	Pass	0.2352	1.63	Pass
	Right	15 cm	0.6291	614	Pass	0.4089	1.63	Pass
	Top	15 cm	1.6908	614	Pass	0.5701	1.63	Pass
	Bottom	15 cm	0.4362	614	Pass	0.2829	1.63	Pass
1	Front	15 cm	0.6085	614	Pass	0.4265	1.63	Pass
	Back	15 cm	0.123	614	Pass	0.1948	1.63	Pass
	Left	15 cm	0.7501	614	Pass	0.1742	1.63	Pass
	Right	15 cm	0.5128	614	Pass	0.4253	1.63	Pass
	Top	15 cm	1.7417	614	Pass	0.5664	1.63	Pass
	Bottom	15 cm	0.4685	614	Pass	0.3141	1.63	Pass

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