

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Harman Becker Automotive Systems
FCC ID:	T8GWCME125

1.2 EUT INFORMATION

Product Name:	Wireless Charger
Model No.:	E125
Trade Mark:	N/A
DUT Stage:	<i>Production Unit</i>
Operating Frequency Range:	120KHz -127.7KHz
Antenna Type:	Coil antenna
Power Supply	DC12.0V
Sample Received Date:	May 8, 2020
Sample Tested Date:	May 12, 2020 to May 18, 2020

1.3 OTHER INFORMATION

Support Equipment

- 1) Client device – Specific Loading - Demoboard 15W with phones (Samsung S8) connected to phone's GND (15W)
- 2) Client device – iPhone 8 (7.5W)

1.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

According to KDB680106 D01 RF Exposure Wireless Charging Apps v03 (April 9, 2018), the requirement of RF exposure for the Wireless Charging device shall be met.

2. EQUIPMENT LIST

Test Equipment List						
Equipment No.	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
EW-3412	Electric and Magnetic Field Probe - Analyzer	NARDASAFETY	EHP-200A	170WX91004	Jan 23, 2020	Jan 23, 2021

3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

According to KDB680106 D01 RF Exposure Wireless Charging Apps v03 (April 9, 2018), the requirement of RF exposure for the Wireless Charging device shall be met.

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

3.2.1.1

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

Limits for General Population/Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
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

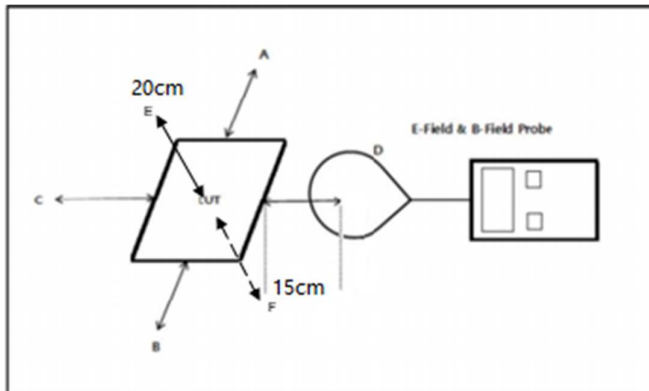
Note: f = frequency in MHz: * = Plane-wave equivalents power density.

3.2.2 Test Procedure

Enabled the EUT to transmit and receive data continue

- The field strength of both E-field and H-field was measured at 15 cm surrounding the device and 20 cm above the top surface using the equipment list above for determining compliance with the MPE requirements of FCC Part 1.1310.
- For 15W wireless charging, specific loading is required for providing Max. output power for testing.
- For 7.5W wireless charging, the RF power density was measured with the battery at 3 different charge conditions: battery at less than 1 % , battery at 50% charger, battery at 99% charger (This condition is applicable for using mobile as Client device only).
- Maximum E-field and H-field measurements were made 15cm from each side of the EUT. Along the side of the EUT and still 15cm away from the edge of the EUT, the field probes were positioned at the location where there is maximum field strength. The maximum E-field and H-field is reported below.
- This device uses a wireless charging circuit for power transfer operating at the frequency of 120-127.7 kHz. Thus, the 300 kHz limits were used: E-field Limit = 614 (V/m); H-field limit = 1.63 (A/m).

3.2.3 Test setup





Note

- The RF exposure test is performed in the shield room
- The test distance is between the edge of the charger and the geometric center of probe
- The aggregate at 15 cm surrounding the device and 20 cm above the top surface from transmitting coil is demonstrated.
- Test Position: Rear, Right, Front, Left, Top, Bottom

3.3 TEST DATA

Charging with specific receiver loading (15W) – Max. output power

E-Field Strength

Test Mode	Probe Position (V/m) C-Rear	Probe Position (V/m) B-Right	Probe Position (V/m) D-Front	Probe Position (V/m) A-Left	Probe Position (V/m) E-Top	Probe Position (V/m) F-Bottom	Limits (V/m)
Max. 15W power wireless charging	0.6587	0.7133	0.9373	0.2624	0.8605	0.6512	$614/2 = 307$

H-Field Strength

Test Mode	Probe Position (A/m) C-Rear	Probe Position (A/m) B-Right	Probe Position (A/m) D-Front	Probe Position (A/m) A-Left	Probe Position (A/m) E-Top	Probe Position (A/m) F-Bottom	Limits (A/m)
Max. 15W power wireless charging	0.2429	0.0925	0.0869	0.1502	0.3828	0.0879	$1.63/2 = 0.815$

Charging with iPhone (7.5W)

E-Field Strength

Test Mode	Battery status	Probe Position (V/m) C-Rear	Probe Position (V/m) B-Right	Probe Position (V/m) D-Front	Probe Position (V/m) A-Left	Probe Position (V/m) E-Top	Probe Position (V/m) F-Bottom	Limits (V/m)
Mode 1	<1% Battery status	0.2600	0.3490	0.2634	0.2660	0.2599	0.2802	$614/2 = 307$
Mode 2	50% Battery status	0.2617	0.3507	0.2659	0.2719	0.2635	0.2749	$614/2 = 307$
Mode 3	99% Battery status	0.2573	0.3452	0.2705	0.2601	0.2587	0.2787	$614/2 = 307$

Charging with iPhone (7.5W)

H-Field Strength

Test Mode	Battery status	Probe Position (A/m) C-Rear	Probe Position (A/m) B-Right	Probe Position (A/m) D-Front	Probe Position (A/m) A-Left	Probe Position (A/m) E-Top	Probe Position (A/m) F-Bottom	Limits (V/m)
Mode 1	<1% Battery status	0.0458	0.0497	0.0803	0.0915	0.0477	0.0411	1.63/2 = 0.815
Mode 2	50% Battery status	0.0460	0.0508	0.0931	0.0937	0.0533	0.0465	1.63/2 = 0.815
Mode 3	99% Battery status	0.0940	0.0435	0.0610	0.0820	0.0487	0.0415	1.63/2 = 0.815

Standby mode – without client device, WPT itself only

E-Field Strength

Test Mode	Probe Position (V/m) C-Rear	Probe Position (V/m) B-Right	Probe Position (V/m) D-Front	Probe Position (V/m) A-Left	Probe Position (V/m) E-Top	Probe Position (V/m) F-Bottom	Limits (V/m)
Standby	0.2571	0.2666	0.2595	0.2630	0.2629	0.2612	614/2 = 307

H-Field Strength

Test Mode	Probe Position (A/m) C-Rear	Probe Position (A/m) B-Right	Probe Position (A/m) D-Front	Probe Position (A/m) A-Left	Probe Position (A/m) E-Top	Probe Position (A/m) F-Bottom	Limits (V/m)
Standby	0.0597	0.0424	0.0973	0.1307	0.1431	0.0933	1.63/2 = 0.815

Remark:

The device meets the mobile RF exposure limit at a 15cm and 20cm separation distance as specified in &2.1091 of the FCC Rules.

Transmitting coil is demonstrated to be less than 50% of the MPE limit.

Test Setup Photo: Worst case

