

Test report No:
NIE: 69207RAN.001A1

Test report

RF EXPOSURE REPORT ACCORDING TO IEEE Std C95.3-2002

(*) Identification of item tested	Wireless charging base for the soccer shin guard		
(*) Trademark	Humanox Soccer		
(*) Model and /or type reference	HUOX 50 Wireless charging base		
(*) Other identification of the product	HW version: v2.0 SW version: data not provided FCC ID: 2A292-HUX5B2		
(*) Features	Wireless Qi		
(*) Manufacturer	Humanox Soccer, S.A. Lugar de la Oropéndola, Calle "D", 1, (Esquina con Avda. Víctimas del Terrorismo) - 11500 El Puerto de Santa María (Cádiz)		
Test method requested, standard	IEEE Std C95.3-2002: "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz". FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.		
Summary	IN COMPLIANCE		
Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager		2021.12.10 13:55:19 +01'00'
Date of issue	2021-12-10		
Report template No	FAN39_01 (*) "Data provided by the client"		

Index

Competences and guarantees	3
General conditions	3
Uncertainty	3
Data provided by the client.....	3
Usage of samples	4
Test sample description	4
Identification of the client.....	4
Testing period and place.....	4
Document history.....	4
Environmental conditions	4
Remarks and comments	5
Testing verdicts.....	5
Appendix A: FCC RF Exposure.....	6
General description of the device under evaluation	7
Evaluation Results.....	7
Qi WPT Evaluation	7
Appendix B: RF Exposure Information	11
FCC RF Exposure evaluation for mobile devices.....	12
Appendix C: Photographs	13

Competences and guarantees

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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the documents:

1. IEEE Std C95.3-2002: "IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz".
2. DEKRA Testing and Certification, S.A.U. internal documents PODT000 and FAN40.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested", "Features", "Other identification of the product" and "Test sample description").
2. Use distance between the nearby users and device antenna.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by the client.

Sample M/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67113/013	Charger base	HUOX 50 Wireless Charging base	-	15/01/2021
67113/009	Shin Pad	HUOX 50 Soccer shin guard	862549047786242	15/01/2021
67113/010	Shin Pad	HUOX 50 Soccer shin guard	862549047786242	15/01/2021

1. Sample M/01 has undergone the test(s) specified in subclause "Test method requested".

Test sample description

The test sample consists of a tabletop ring charger base which supports inductive charging.

Identification of the client

Company name: Humanox Soccer, S.A

Postal address: Lugar de la Oropéndola, calle "D", 1, (Esquina con Avda. Víctimas del Terrorismo),
11500 El Puerto de Santa María (Cádiz), España

Contact person: Rafael Repiso

Telephone / e-mail: +34 654568103 / rafael.repiso@humanox.com

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-07-22
Date (finish)	2021-07-22

Document history

Report number	Date	Description
69207RAN.001	2021-11-11	First release
69207RAN.001A1	2021-10-12	Second release. Measurements at 20 cm in positions 2 and 3 have been included.

Environmental conditions

Date	Max. Temp.	Min. Temp.	Max. Hum.	Min. Hum.	Limit
	°C	°C	%	%	
2021-07-22	27.13	25.76	51.95	42.39	10-40 °C 0-90%

Remarks and comments

The instrumentation utilized to perform the tests covered in this test report is listed in the following table:

	Last Cal. date	Cal. due date	Control Nº
1. Narda EHP-200A E and H Field Analyzer	2019/11	2021/11	7860
3. Low Dielectric Tripod Manfrotto H-491009-01	-	-	5261
4. Temperature and humidity logger HW GROUP HWg-STE	2021/04	2022/04	5780

Tests have been performed by Francisco José Sánchez Calleja.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

FCC 47 CFR § 2.1091	VERDICT			
	N/A	P	F	NM
Standard Qi		P		

Appendix A: FCC RF Exposure

General description of the device under evaluation

The device under test consists of a charger base from smart shin pad HUOX 50 pack.

According to the manufacturer, during its normal use, the separation distance between the device and the body of nearby users will be greater than 20 cm.

RF Exposure evaluation for the standard Qi technology has been conducted through field measurements (see Qi WPT Evaluation section below).

Evaluation Results

Following results correspond to maximum measured field values:

Technology	Frequency (MHz)	Max. E-field (V/m)	Max. H-field (A/m)	Max Power Density (W/m ²)	E-field Limit (V/m)	H-field Limit (A/m)	Power Density Limit (W/m ²)	Verdict
Standard Qi	0.1385	-	0.177	-	-	1.613	-	PASS
	0.1385	0.40	-	-	614.0	-	-	PASS

Table 1: Max H-field and E-field results

Qi WPT Evaluation

According to KDB 680106 D01, 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.

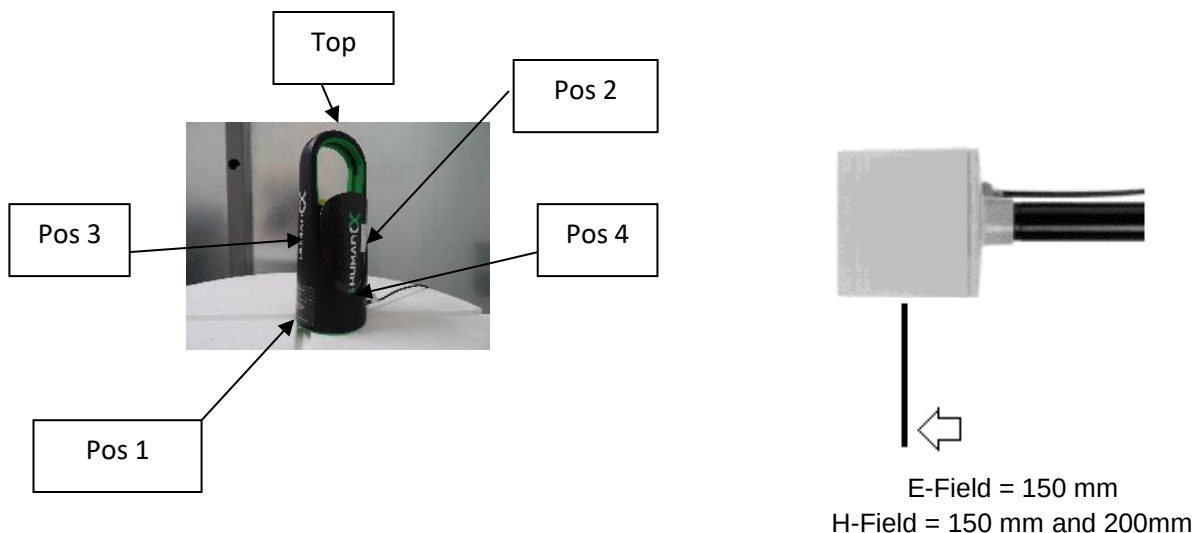


Figure 1: WPT measurement setup

Two testing setups have been measured in order to assess compliance for the device.

- Setup 1 – Charging setup

For the normal charging setup, measurements at 15 cm distance have been performed for all device sides except for the back side. Measurements at 20 cm distance have been performed for the sides where the coils are located, at different battery charge levels.

- Setup 2 – Charger:

Measurements at 15 cm distance over the charger without any device charging were performed for all device sides except for the back side of the charger.

- Setup 1 Measurements

Test results for 10% battery:

Test side	Distance to DUT (cm)	Frequency (MHz)	H-Field (A/m)	Limit (A/m)	% Limit	Verdict
Top	15	0.1488	0.010	1.630	0.6	Pass
Pos 1	15	0.1505	0.050	1.630	3.1	Pass
Pos 2	15	0.1560	0.121	1.630	7.4	Pass
Pos 2	20	0.1525	0.115	1.630	7.0	Pass
Pos 3	15	0.1500	0.142	1.630	8.7	Pass
Pos 3	20	0.1493	0.098	1.630	6.0	Pass
Pos 4	15	0.1543	0.040	1.630	2.5	Pass

Test side	Distance to DUT (cm)	Frequency (MHz)	E-Field (V/m)	Limit (V/m)	% Limit	Verdict
Top	15	0.1488	0.136	614.00	0.0	Pass
Pos 1	15	0.1508	0.267	614.00	0.0	Pass
Pos 2	15	0.1570	0.224	614.00	0.0	Pass
Pos 3	15	0.1500	0.371	614.00	0.1	Pass
Pos 4	15	0.1495	0.244	614.00	0.0	Pass

Test results for 50% battery:

Test side	Distance to DUT (cm)	Frequency (MHz)	H-Field (A/m)	Limit (A/m)	% Limit	Verdict
Top	15	0.1360	0.032	1.630	1.9	Pass
Pos 1	15	0.1528	0.027	1.630	1.7	Pass
Pos 2	15	0.1538	0.130	1.630	8.0	Pass
Pos 2	20	0.1395	0.043	1.630	2.6	Pass
Pos 3	15	0.1385	0.177	1.630	10.8	Pass
Pos 3	20	0.1418	0.042	1.630	2.6	Pass
Pos 4	15	0.1493	0.043	1.630	2.7	Pass

Test side	Distance to DUT (cm)	Frequency (MHz)	E-Field (V/m)	Limit (V/m)	% Limit	Verdict
Top	15	0.1473	0.12	614.00	0.0	Pass
Pos 1	15	0.1478	0.27	614.00	0.0	Pass
Pos 2	15	0.1540	0.28	614.00	0.0	Pass
Pos 3	15	0.1385	0.40	614.00	0.1	Pass
Pos 4	15	0.1505	0.19	614.00	0.0	Pass

Test results for 90% battery:

Test side	Distance to DUT (cm)	Frequency (MHz)	H-Field (A/m)	Limit (A/m)	% Limit	Verdict
Top	15	0.1528	0.009	1.630	0.6	Pass
Pos 1	15	0.1443	0.009	1.630	0.6	Pass
Pos 2	15	0.1750	0.010	1.630	0.6	Pass
Pos 2	20	0.1473	0.121	1.630	7.4	Pass
Pos 3	15	0.1750	0.010	1.630	0.6	Pass
Pos 3	20	0.1448	0.065	1.630	4.0	Pass
Pos 4	15	0.1423	0.023	1.630	1.4	Pass

Test side	Distance to DUT (cm)	Frequency (MHz)	E-Field (V/m)	Limit (V/m)	% Limit	Verdict
Top	15	0.1250	0.069	27.50	0.2	Pass
Pos 1	15	0.1553	0.069	27.50	0.3	Pass
Pos 2	15	0.1598	0.069	27.50	0.3	Pass
Pos 3	15	0.1748	0.069	27.50	0.3	Pass
Pos 4	15	0.1528	0.072	27.50	0.3	Pass

- Setup 2 Measurements

Test results Without Charge

Test side	Distance to DUT (cm)	Frequency (MHz)	H-Field (A/m)	Limit (A/m)	% Limit	Verdict
Top	15	0.1600	0.048	4.56	1.1	Pass
Pos 1	15	0.1375	0.049	5.00	1.0	Pass
Pos 2	15	0.1760	0.049	4.15	1.2	Pass
Pos 3	15	0.1748	0.049	4.18	1.2	Pass
Pos 4	15	0.1375	0.049	5.00	1.0	Pass

Test side	Distance to DUT (cm)	Frequency (MHz)	E-Field (V/m)	Limit (V/m)	% Limit	Verdict
Top	15	0.1798	0.36	87.00	0.4	Pass
Pos 1	15	0.1375	0.36	87.00	0.4	Pass
Pos 2	15	0.1753	0.39	87.00	0.5	Pass
Pos 3	15	0.1735	0.36	87.00	0.4	Pass
Pos 4	15	0.1695	0.36	87.00	0.4	Pass

All H-Field and E-Field values are in compliance to values shown into §1.1310, paragraph (e), "Table 1: limits for Maximum Permissible Exposure (MPE)".

Appendix B: RF Exposure Information

FCC RF Exposure evaluation for mobile devices

Devices operating in standalone mobile device exposure conditions may contain a single transmitter or multiple transmitters that do not transmit simultaneously. A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be at least 20 cm and fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated. The minimum test separation distance required for a device to comply with mobile device exposure conditions must be clearly identified in the installation and operating instructions, for all installation and exposure conditions, to enable users and installers to comply with RF exposure requirements. For mobile devices that have the potential to operate in portable device exposure conditions, similar to the configurations described in § 2.1091(d)(4), a KDB inquiry is required to determine the SAR test requirements for demonstrating compliance.

When a device qualifies for the categorical exclusion provision of § 2.1091(c), the minimum test separation distance may be estimated, when applicable, by simple calculations according to plane-wave equivalent conditions, to ensure the transmitter and its antenna(s) can operate in manners that meet or exceed the estimated distance. The source-based time-averaged maximum radiated power, according to the maximum antenna gain, must be applied to calculate the field strength and power density required to establish the minimum test separation distance. When the estimated test separation distance becomes overly conservative and does not support compliance, MPE measurement or computational modeling may be used to determine the required minimum separation distance.

According to §1.1310 Radiofrequency radiation exposure limits, paragraph (e), the limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields are:

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