TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: 2AIOC-1010T

Product: WIRELESS CHARGING PAD

Model No.: HKWP1010T-05

Additional Model: HKWP1010-05, HKWP1010-10Q, 828499, VWWIRLSCHRG

Trade Mark: N/A

Report No.: TCT180418E008

Issued Date: Apr. 25, 2018

Issued for:

HANK ELECTRONICS CO., LTD.
Floor 2nd-7th, A8, Hongye Industry City, Lezhujiao, Zhoushi Road, Baoan District, Shenzhen, China

Issued By:

Shenzhen Tongce Testing Lab.
1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China
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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	WIRELESS CHARGING PAD
Model No.:	HKWP1010T-05
Additional Model No.:	HKWP1010-05, HKWP1010-10Q, 828499, VWWIRLSCHRG
Trade Mark:	**N/A**
Applicant:	HANK ELECTRONICS CO., LTD.
Address:	Floor 2nd-7th, A8, Hongye Industry City, Lezhujiao, Zhoushi Road, Baoan District, Shenzhen, China
Manufacturer:	HANK ELECTRONICS CO., LTD.
Address:	Floor 2nd-7th, A8, Hongye Industry City, Lezhujiao, Zhoushi Road, Baoan District, Shenzhen, China
Date of Test:	Apr. 19, 2018 - Apr. 24, 2018
Applicable Standards:	FCC CFR Title 47 Part 18

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Jin Wang	***Date:***	***Apr. 24, 2018***
	Jin Wang		
Reviewed By:	Beryl Zhao	***Date:***	***Apr. 25, 2018***
	Beryl Zhao		
Approved By:	Tomsin	***Date:***	***Apr. 25, 2018***
	Tomsin		

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2. Test Result Summary

Requirement	CFR 47 Section	Result
AC Power Line Conducted Emission	§18.307	PASS
Spurious Emission	§18.305	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. EUT Description

Product:	WIRELESS CHARGING PAD
Model No.:	HKWP1010T-05
Additional Model No.:	HKWP1010-05, HKWP1010-10Q, 828499, VWWIRLSCHRG
Trade Mark:	**N/A**
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	121-175KHz
Modulation Technology:	MSK
Antenna Type:	Coil Antenna
Power Supply:	DC 5V via adapter
Remark:	All models above are identical in interior structure, electrical circuits and components, and just model names are different for the marketing requirement.

4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%) with Fully-charged battery.
The sample was placed (0.1m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Mobile Phone	SM-G9350	R28HA2ER3GT	/	SAMSUNG
Adapter	EP-TA20CBC	R37HAEY0DT1RT3	/	SAMSUNG

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 645098

  Shenzhen Tongce Testing Lab

  The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

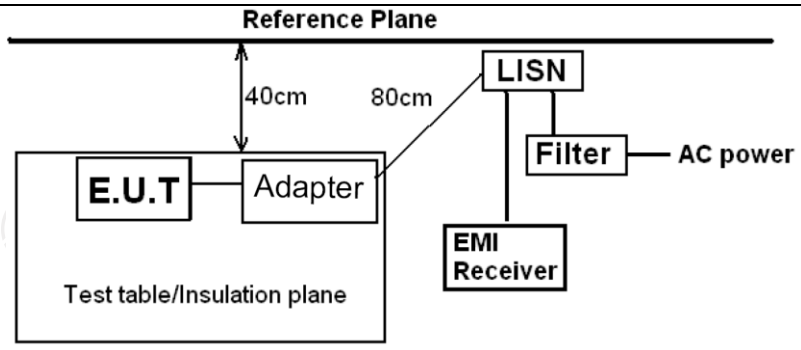
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Conducted Emission

6.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.307</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Charging</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

6.1.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 27, 2018
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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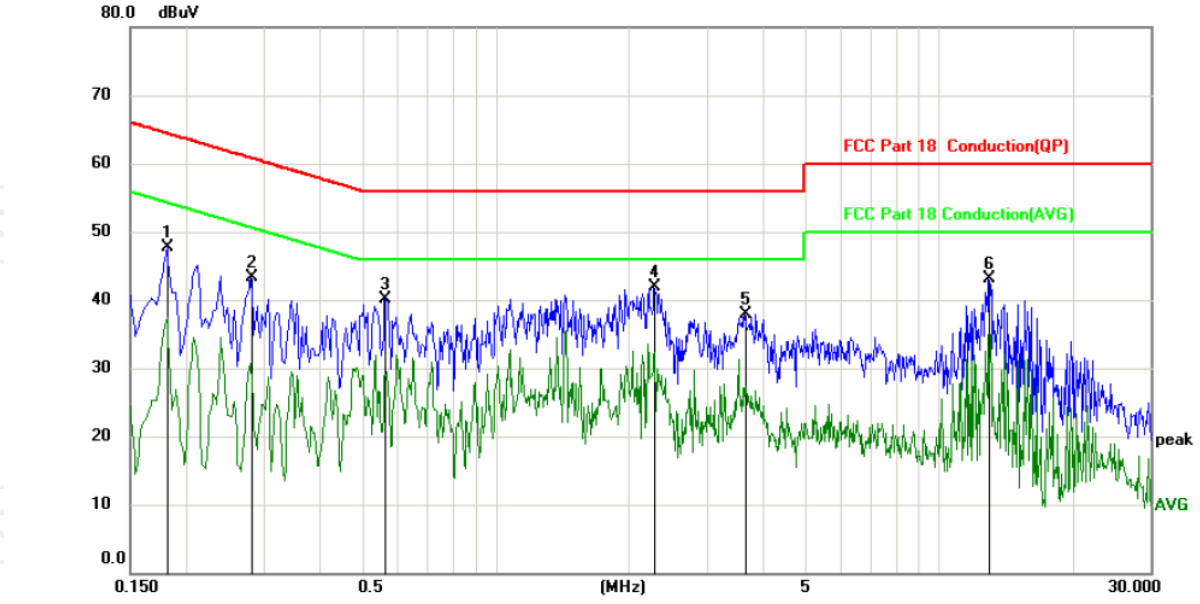
6.1.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site | Phase: L1 | Temperature: 25

Limit: FCC Part 18 Conduction(QP) | Power: | Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1815	36.24	11.38	47.62	64.42	-16.80	peak	
2		0.2805	32.00	11.33	43.33	60.80	-17.47	peak	
3		0.5639	28.87	11.19	40.06	56.00	-15.94	peak	
4	*	2.2785	30.57	11.27	41.84	56.00	-14.16	peak	
5		3.6600	27.22	10.76	37.98	56.00	-18.02	peak	
6		12.9255	32.11	11.04	43.15	60.00	-16.85	peak	

Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

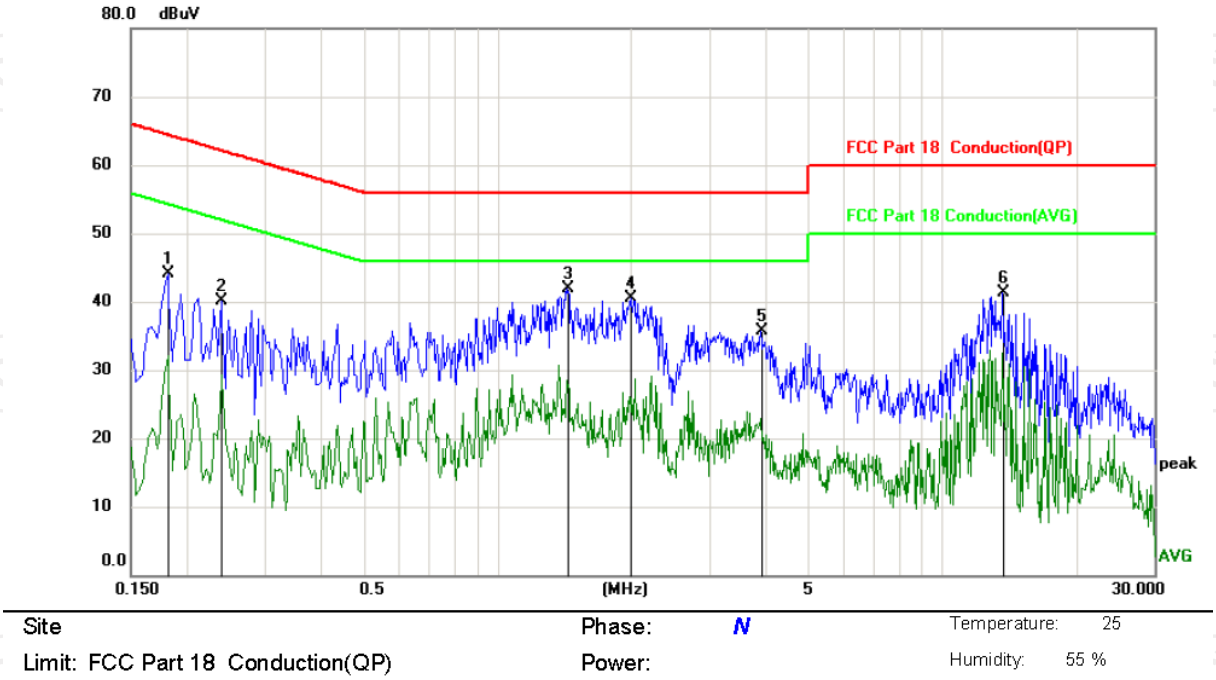
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site | Phase: *N* | Temperature: 25

Limit: FCC Part 18 Conduction(QP) | Power: | Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1815	32.69	11.38	44.07	64.42	-20.35	peak	
2		0.2400	28.83	11.35	40.18	62.10	-21.92	peak	
3	*	1.4370	30.70	11.14	41.84	56.00	-14.16	peak	
4		1.9950	29.19	11.37	40.56	56.00	-15.44	peak	
5		3.9030	24.96	10.67	35.63	56.00	-20.37	peak	
6		13.6950	30.29	11.06	41.35	60.00	-18.65	peak	

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

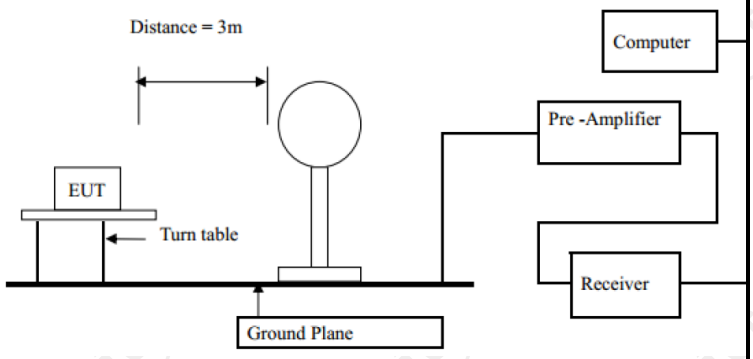
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

6.2. Radiated Spurious Emission Measurement

6.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.305</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Refer to item 4.1</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Equipment</th><th>Operating frequency</th><th>RF Power generated by equipment (watts)</th><th>Field strength limit (uV/m)</th><th>Distance (meters)</th></tr>
<tr><td>Any type unless otherwise specified (miscellaneous)</td><td>Any ISM frequency</td><td>Below 500
500 or more</td><td>25
25 × SQRT(power/500)</td><td>300
[1]300</td></tr>
<tr><td></td><td>Any non-ISM frequency</td><td>Below 500
500 or more</td><td>15
15 × SQRT(power/500)</td><td>300
[1]300</td></tr>
<tr><td>Industrial heaters and RF stabilized arc welders</td><td>On or below 5,725 MHz
Above 5,725 MHz</td><td>Any
Any</td><td>10
([2])</td><td>1,600
([2])</td></tr>
<tr><td>Medical diathermy</td><td>Any ISM frequency
Any non-ISM frequency</td><td>Any
Any</td><td>25
15</td><td>300
300</td></tr>
<tr><td>Ultrasonic</td><td>Below 490 kHz</td><td>Below 500
500 or more</td><td>2,400/F(kHz)
2,400/F(kHz) × SQRT(power/500)</td><td>300
[3]300</td></tr>
<tr><td></td><td>490 to 1,600 kHz
Above 1,600 kHz</td><td>Any
Any</td><td>24,000/F(kHz)
15</td><td>30
30</td></tr>
<tr><td>Induction cooking ranges</td><td>Below 90 kHz
On or above 90 kHz</td><td>Any
Any</td><td>1,500
300</td><td>[4]30
[4]30</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 
</td></tr>
</table>

Test Procedure:	1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. 2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=200Hz for 9K< f <150 KHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 9 KHz, VBW= 30KHz for 150KHz <f 30 MHz for peak measurement.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

6.2.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ	200061	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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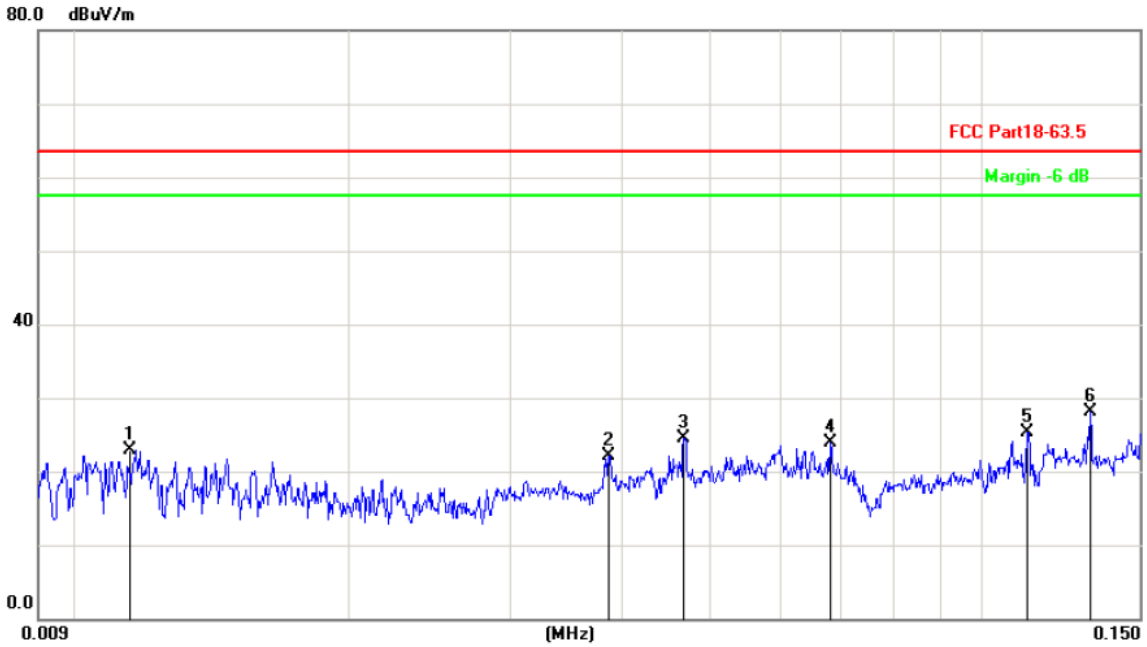
6.2.3. Test Data

Please refer to following diagram for individual

9KHz-30MHz

9KHz-150KHz:

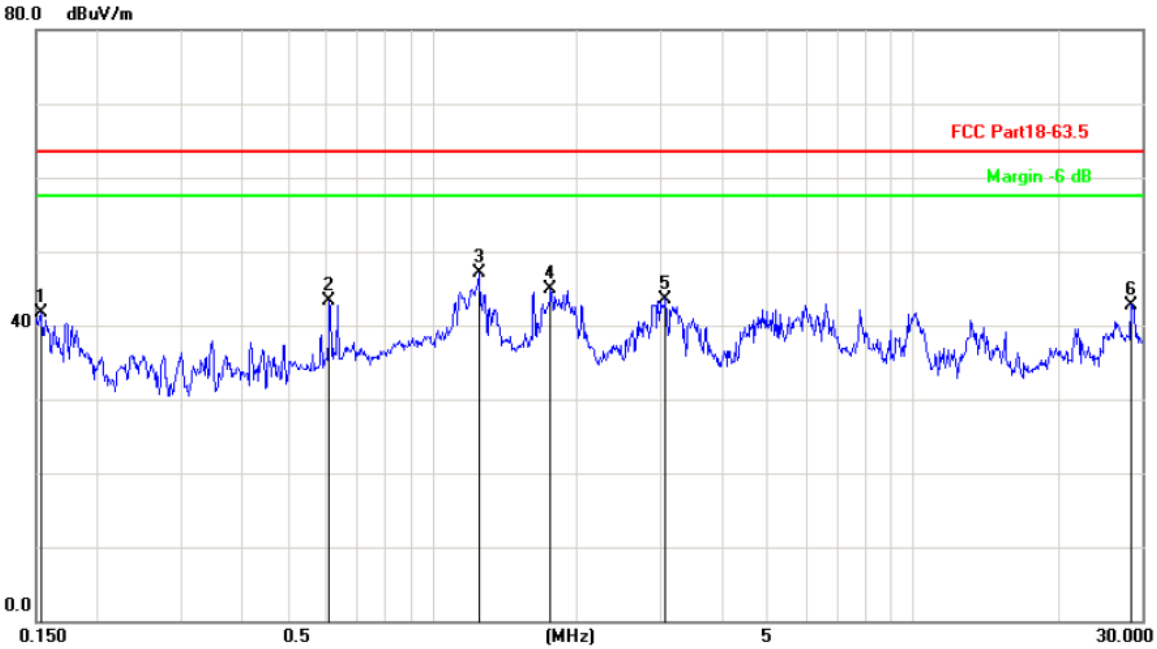


Site
Limit: FCC Part18-63.5
Polarization: *Vertical*
Power:
Temperature: 25
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		0.0114	21.00	1.81	22.81	63.50	-40.69	peak			
2		0.0386	22.39	-0.32	22.07	63.50	-41.43	peak			
3		0.0468	23.71	0.88	24.59	63.50	-38.91	peak			
4		0.0680	22.38	1.48	23.86	63.50	-39.64	peak			
5		0.1126	20.67	4.65	25.32	63.50	-38.18	peak			
6	*	0.1322	22.61	5.56	28.17	63.50	-35.33	peak			

NOTE: If measurements are made at only one closer fixed distance, then the permissible field strength limits shall be adjusted using 1/d as an attenuation factor. So the limit at 3 m is 1500 uv/m(≈63.5 dBuv/m)

150KHz-30MHz:



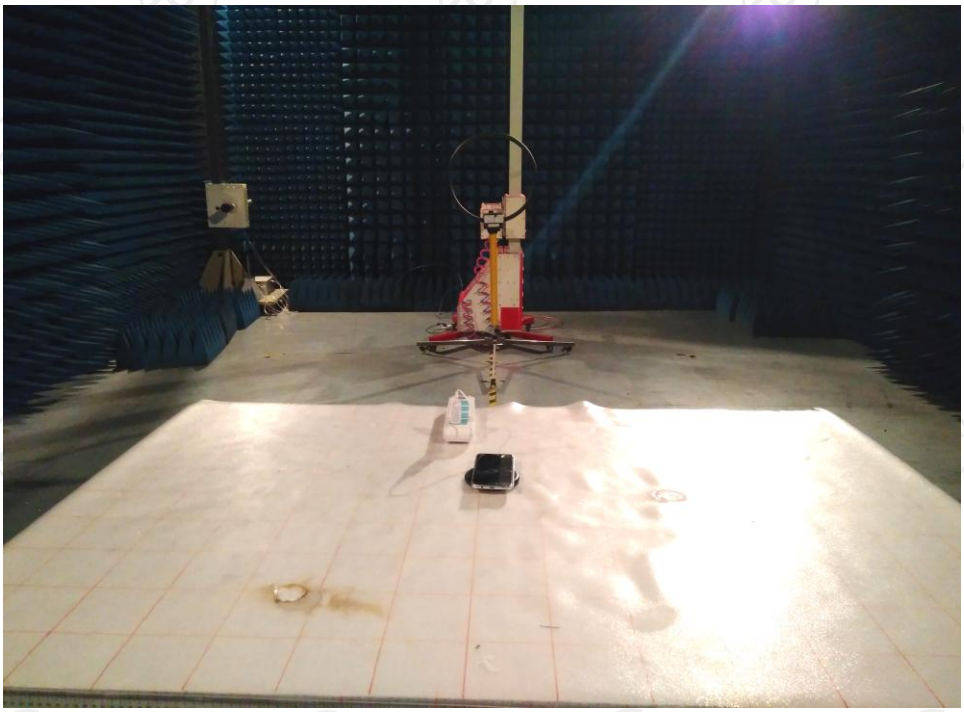
Site
Limit: FCC Part18-63.5
Polarization: *Vertical*
Power:
Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		0.1532	34.68	7.11	41.79	63.50	-21.71	peak			
2		0.6108	37.34	5.91	43.25	63.50	-20.25	peak			
3	*	1.2485	41.35	5.71	47.06	63.50	-16.44	peak			
4		1.7620	39.69	5.28	44.97	63.50	-18.53	peak			
5		3.0574	39.17	4.43	43.60	63.50	-19.90	peak			
6		28.4516	38.24	4.56	42.80	63.50	-20.70	peak			

NOTE: If measurements are made at only one closer fixed distance, then the permissible field strength limits shall be adjusted using 1/d as an attenuation factor. So the limit at 3 m is 1500 uv/m(≈63.5 dBuv/m)

Appendix A: Photographs of Test Setup

Product: WIRELESS CHARGING PAD
Model: HKWP1010T-05
Radiated Emission



Conducted Emission

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Appendix B: Photographs of EUT

Product: WIRELESS CHARGING PAD
Model: HKWP1010T-05
External Photos

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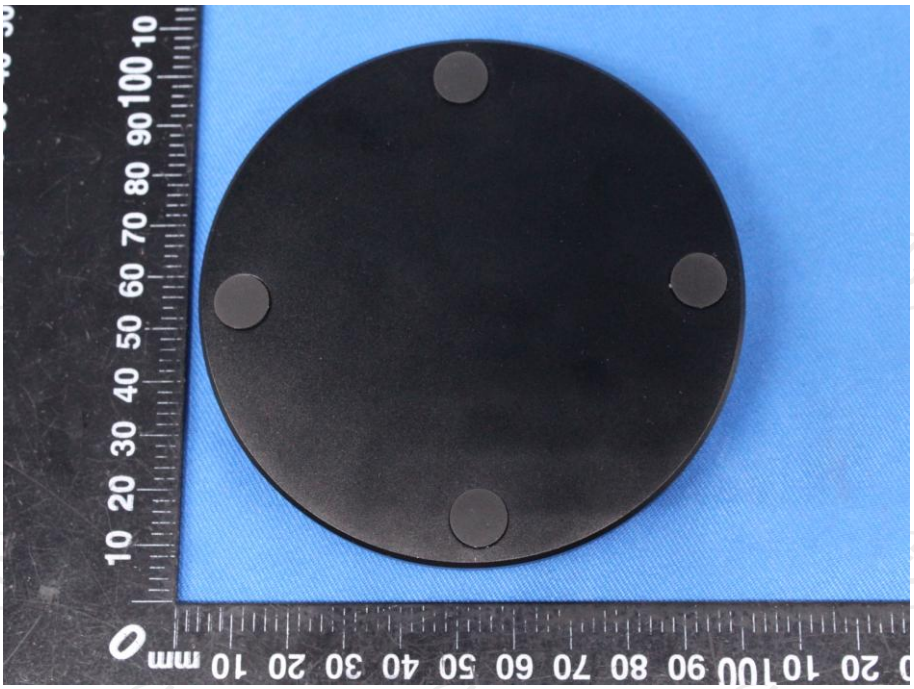

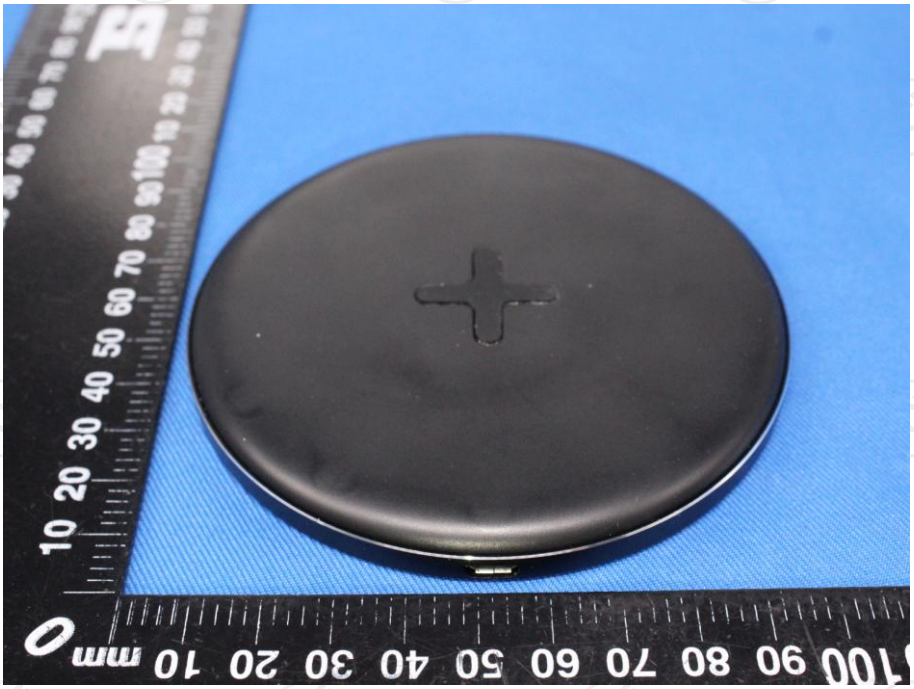

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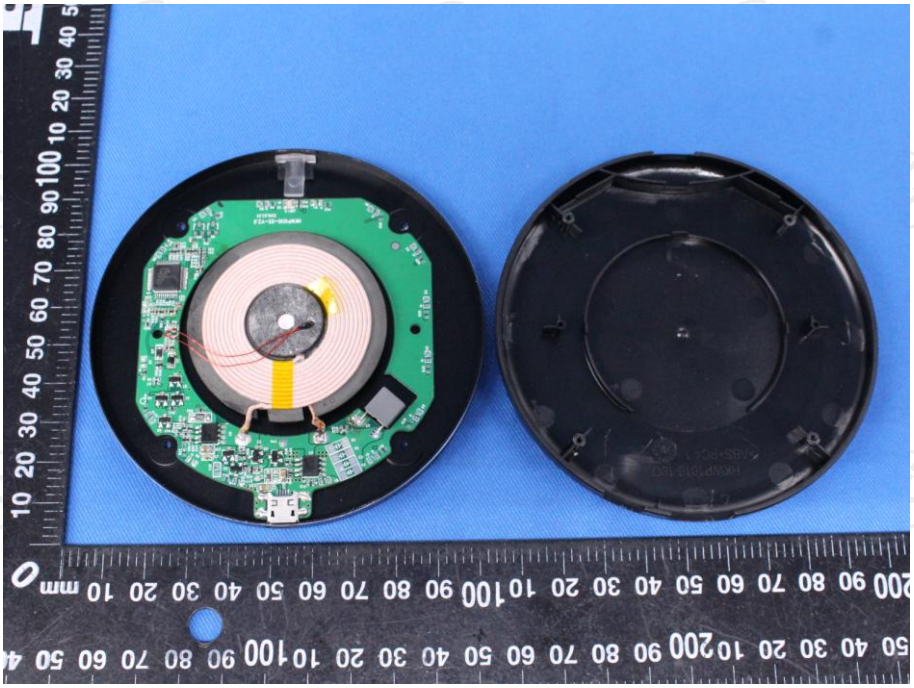
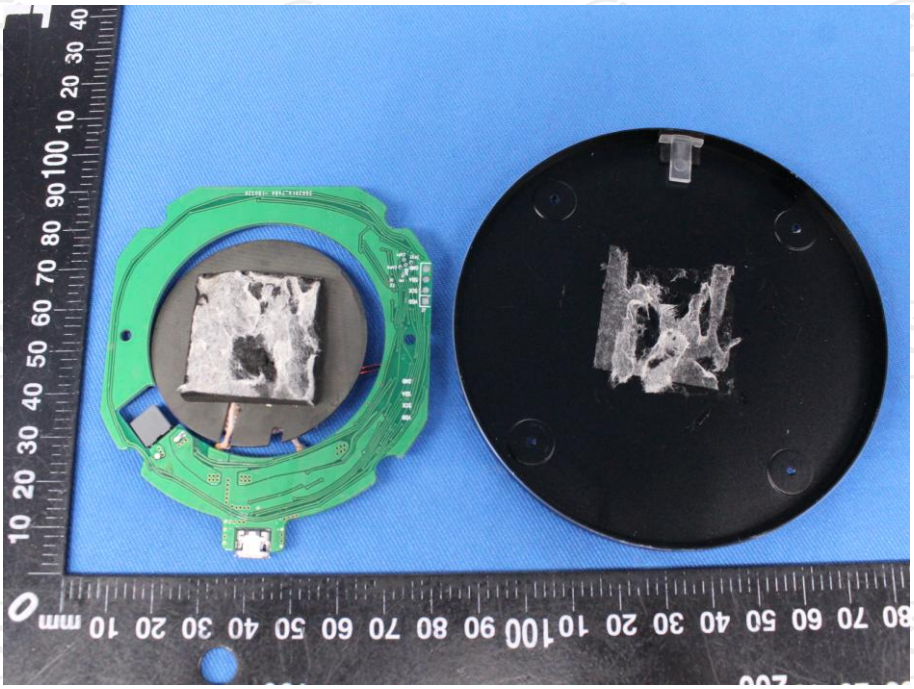
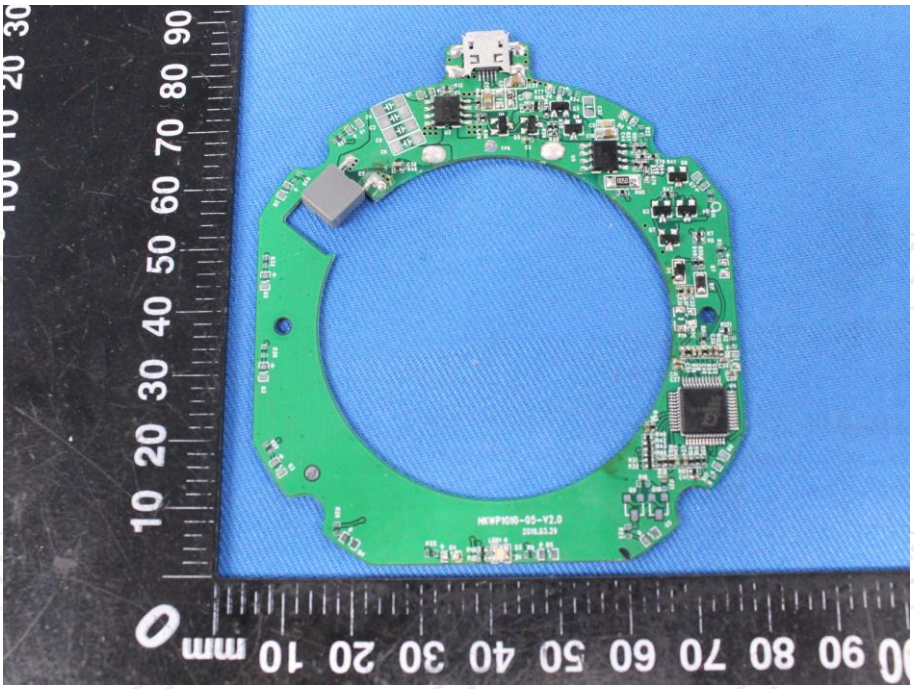
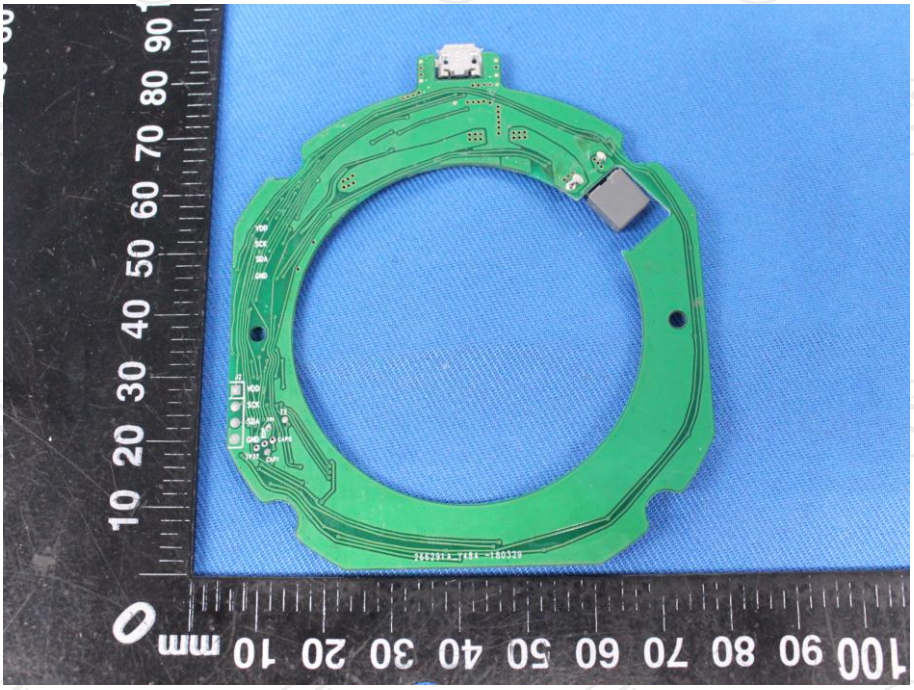
Product: WIRELESS CHARGING PAD
Model: HKWP1010T-05
Internal Photos









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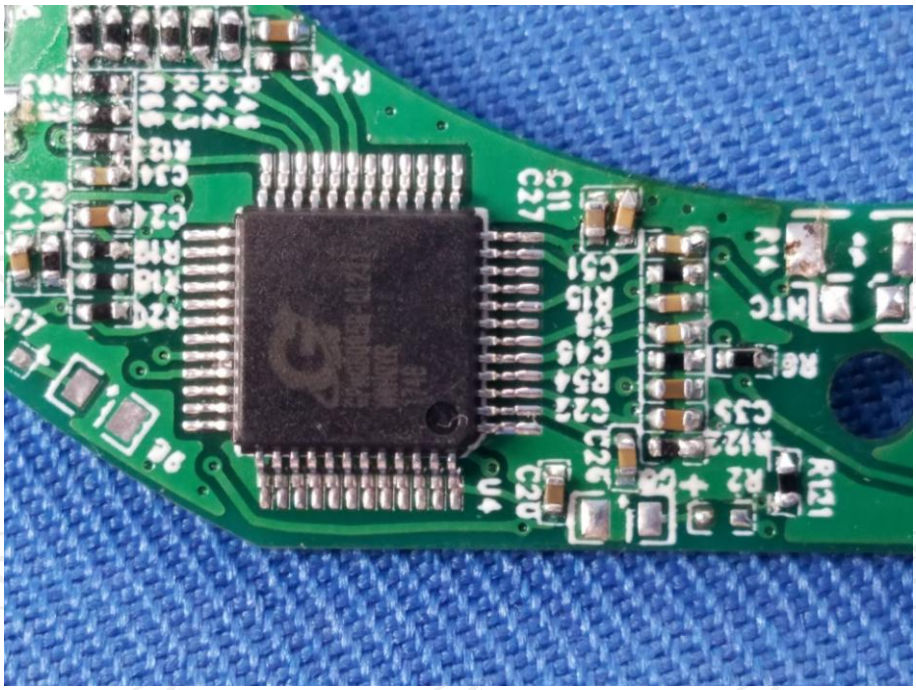

*****END OF REPORT*****

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