

RF Exposure Evaluation Report

Applicant: Liquipel Protection LLC

Address of Applicant: Street: 19800 MacArthur Blvd. Suite 300, Irvine, CA, 92612, USA

Equipment Under Test (EUT)

Product Name: Wireless Charger

Model No.: LPWP01-RG (Rose Gold)
LPWP01-B (Black)
LPWP01-S (Silver)
LPWP01-BL (Blue)
LPWP01-G (Gold)

FCC ID: 2AVV6LPWP01

Applicable standards: FCC CFR Title 47 Part 2 Subpart J Section 2.1091

Date of sample receipt: 06 Mar., 2020

Date of Test: 06 Mar., to 27 Mar., 2020

Date of report issue: 27 Mar., 2020

Test Result: PASS*

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	20 Mar., 2020	Original
01	27 Mar., 2020	Update pages 5, 7, 8

Tested By:

YT Yang
Test Engineer

Date:

27 Mar., 2020

Reviewed By:

Winner Zhang
Project Engineer

Date:

27 Mar., 2020

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4 General Information

Client Information

Applicant:	Liquipel Protection LLC
Address of Applicant:	Street: 19800 MacArthur Blvd. Suite 300, Irvine, CA, 92612, USA
Manufacturer:	Liquipel Protection LLC
Address:	Street: 19800 MacArthur Blvd. Suite 300, Irvine, CA, 92612,USA
Factory:	GUANG ZHOU C AND T INDUSTRY COMPANY LIMITED
Address:	NO.3 HEPING ROAD DASHI PANYU DISTRICT GUANGZHOU

General Description of E.U.T.

Product Name:	Wireless Charger
Model No.:	LPWP01-RG (Rose Gold) LPWP01-B (Black) LPWP01-S (Silver) LPWP01-BL (Blue) LPWP01-G (Gold)
Operation Frequency:	114.5kHz~204kHz
Modulation technology:	Loading modulation
Antenna Type:	Coil Antenna
Power supply: (Wireless charging)	Input: DC 5V, 2.0A Output: DC 5V, 1.0A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Remark :	Model No.: LPWP01-RG(Rose Gold), LPWP01-B(Black), LPWP01-S (Silver), LPWP01-BL(Blue), LPWP01-G (Gold) were identical inside, the electrical circuit design, layout, components used and internal wiring. with only difference being model name and color.

Operating Modes

Operating mode	Detail description
Full mode	Keep the EUT inFull mode

Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Skytek	Wireless charging match load	N/A	N/A	N/A
Apple	Smart Phone	iPhone 11 Pro	N/A	BCG-E3305A
Xiaomi	Adapter	MDY-03-EB	N/A	N/A

Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Field Strength (9kHz ~ 30MHz)	±2% (k=2)

Additions to, deviations, or exclusions from the method

No

Laboratory Facility

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

● **FCC- Designation No.: CN1211**

Shenzhen ZhongjianNanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of Shenzhen ZhongjianNanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen ZhongjianNanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

Laboratory Location

Shenzhen ZhongjianNanfang Testing Co.,Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Magnetic field meter	Narda	ELT-400	B-0138	01-07-2020	01-06-2021
B-Field Probe	Narda	B-Field Probe 100 cm2	B-0137	06-20-2019	06-19-2020
Broadband field meter	Narda	NBM-550	B-0959	11-19-2019	11-18-2020
B-Field Probe	Narda	EF0391	A-1034	11-19-2019	11-18-2020

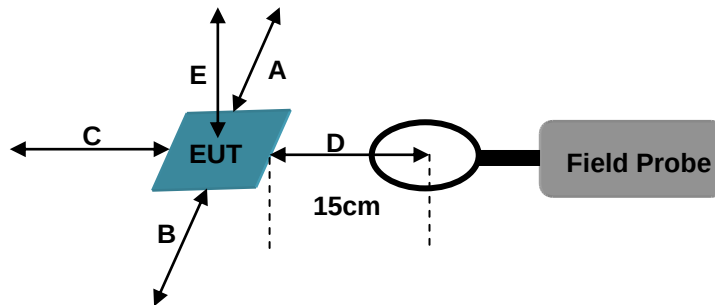
5 Technical Requirements Specification in FCC CFR Title 47 Part 2.1091

Limits

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

According to KDB 680106 D01 RF Exposure Wireless Charging Apps, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm for devices designed for typical desktop applications. E and H field strength measurements or numerical modelling 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.

Test Setup Block



Remrak: The ELT-400 probe antenna diameter is 11cm.

Limits For General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW /cm ²)	Averaging Time (minutes)
0.3 ~ 3.0	614	1.63	(100)*	30
3.0 ~ 30	824/f	2.19/f	(180/f ₂)*	30
30 ~ 300	27.5	0.073	0.2	30
300~1500	-	-	f/1500	30
1500~100000	-	-	1.0	30

Test Procedure

KDB 680106 D01 Section 5(b):				
(1)	Power transfer frequency is less than 1 MHz. -- Yes, The device operates at a frequency of 114.5kHz-204kHz.			
(2)	Output power from each primary coil is less than or equal to 15 watts. -- Yes, the maximum output power of the primary coil is 5W.			
(3)	The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils. --Yes, the transfer system includes only single primary and secondary coils.			
(4)	Client device is placed directly in contact with the transmitter. -- Yes, client device is placed directly in contact with the transmitter.			
(5)	Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion). -- Yes, the DUT is a Wireless Charging mobile.			
(6)	The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit. --Yes the EUT field strength levels are less than 50% of the MPE limit.			

1. Turn on the ELT-400 power switch, select the range of 320 μ T or 80mT (determined according to the actual radiation intensity of DUT), select the peak detection mode, select the Max-Hold display, and select the low sideband range at 30Hz.
2. Measured the ambient noise at this time and record.
3. During the measurement, the magnetic field probe centre of the ELT-400 is kept in 15cm distance from each test surface of the wireless charging base, and recorded the measured values of the A, B, C, D, and E side are separately.
4. After all the measured values of the A, B, C, D, and E side are subtracted the background noise separately, they are the true magnetic field strength values at that point.
5. The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Result

a) 0% charging load mode (for input: 5V, output: empty load)

Electric Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (V/m)	50 % of Limit (V/m)	Limit (V/m)
A	15	0.145	307.00	614
B	15	0.146	307.00	614
C	15	0.145	307.00	614
D	15	0.149	307.00	614
E	20	0.142	307.00	614

Magnetic Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.166	0.815	1.63
B	15	0.167	0.815	1.63
C	15	0.145	0.815	1.63
D	15	0.141	0.815	1.63
E	20	0.112	0.815	1.63

b) 50% charging load mode (for input: 5V, output: 1A)

Electric Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (V/m)	50 % of Limit (V/m)	Limit (V/m)
A	15	0.158	307.00	614
B	15	0.154	307.00	614
C	15	0.156	307.00	614
D	15	0.153	307.00	614
E	20	0.150	307.00	614

Magnetic Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.170	0.815	1.63
B	15	0.159	0.815	1.63
C	15	0.150	0.815	1.63
D	15	0.142	0.815	1.63
E	20	0.120	0.815	1.63

c) 100% charging load mode (for input: 5V, output: 1A)

Electric Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (V/m)	50 % of Limit (V/m)	Limit (V/m)
A	15	0.163	307.00	614
B	15	0.158	307.00	614
C	15	0.159	307.00	614
D	15	0.160	307.00	614
E	20	0.155	307.00	614

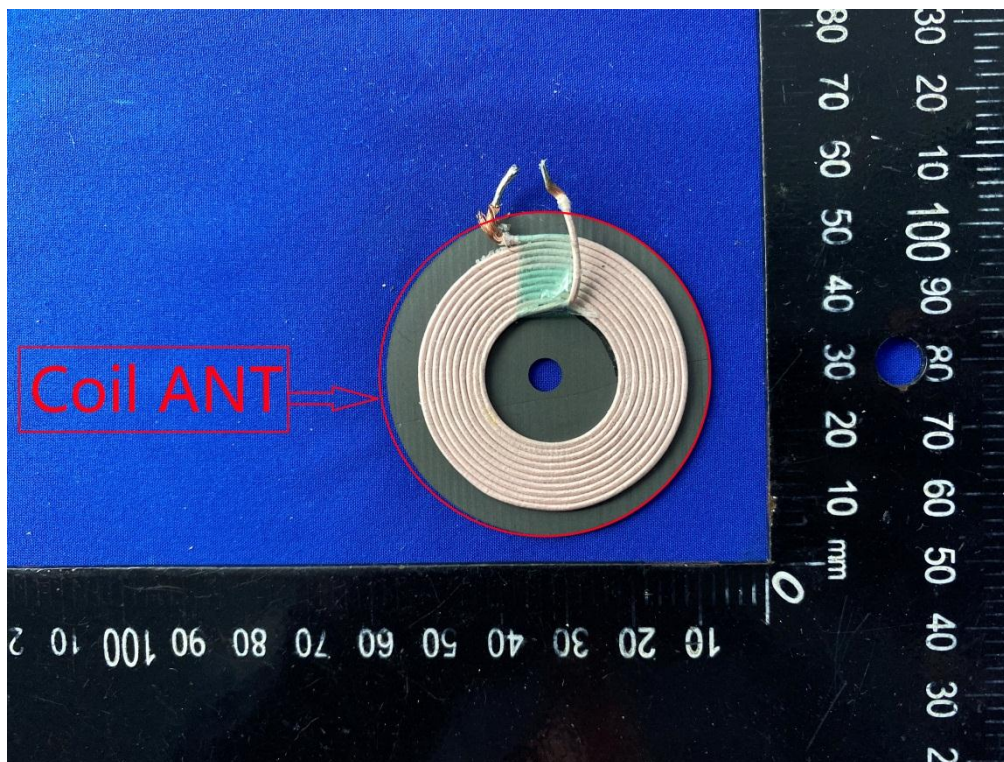
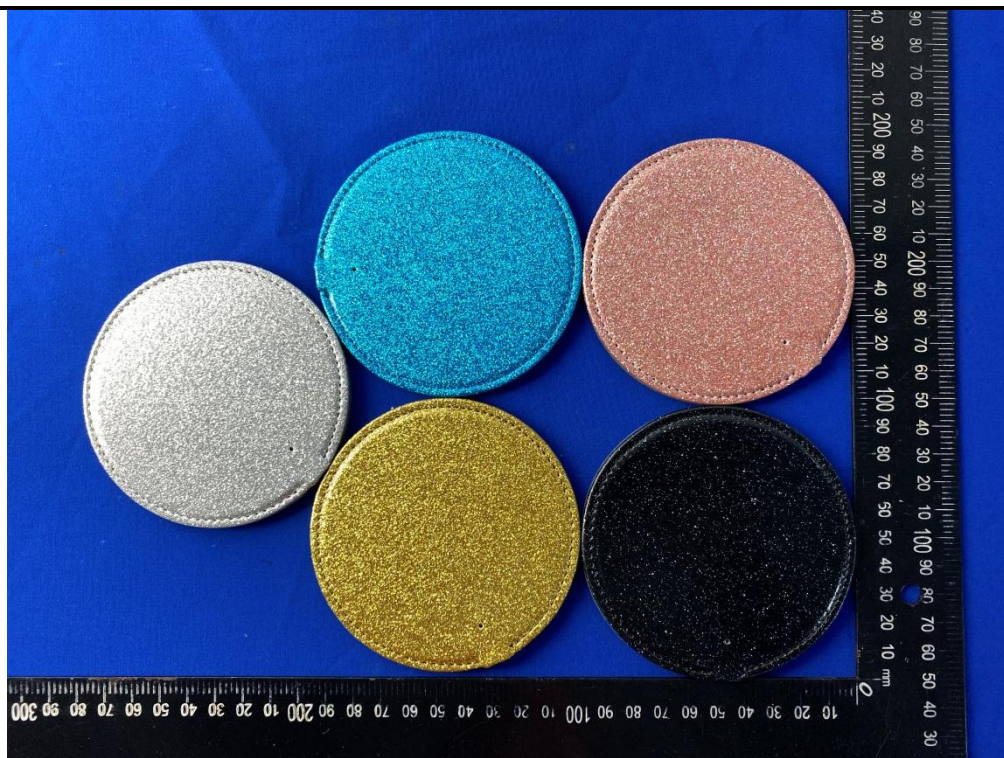
Magnetic Field Strength Measurement

Measured Side	Distance (cm)	Measured Value (A/m)	50 % of Limit (A/m)	Limit (A/m)
A	15	0.175	0.815	1.63
B	15	0.162	0.815	1.63
C	15	0.155	0.815	1.63
D	15	0.146	0.815	1.63
E	20	0.124	0.815	1.63

6 Test Setup Photos:



7 EUT Photos:



-----End of report-----