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RF EXPOSURE REPORT

Report Reference No.....: **CTL1908212031-MPE**

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Applicant's name.....: **Q & M Industrial Company Limited**

Address.....: RM 1405A 14/F LUCKY CTR 165-171 WANCHAI RD WANCHAI HONGKONG

Testing Laboratory Name: **Shenzhen CTL Testing Technology Co., Ltd.**

Address.....: Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China.

Test specification

Standard: **FCC CFR 47 part1, 1.1307(b), 1.1310**

TRF Originator.....: Shenzhen CTL Testing Technology Co., Ltd.

Master TRF.....: Dated 2011-01

Test item description: Vault c-smart wireless 26950mah power pack

FCC ID.....: **2AULO-RMC99701**

Trade Mark: Ridgemonkey

Model/Type reference.....: RMC99701

Transmit Frequency.....: 115~205KHz

Antenna type: Loop antenna

Date of receipt of test item: Sep. 13, 2019

Date of sampling.....: Sep. 13, 2019

Date of Test Date: Sep. 13, 2019-Sep. 22, 2019

Data of Issue: Sep. 26, 2019

Result.....: Pass

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TEST REPORT

Test Report No. : CTL1908212031-MPE	Sep. 26, 2019 Date of issue
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Equipment under Test : Vault c-smart wireless 26950mah power pack

Model /Type : RMC99701

Listed Models : N/A

Applicant : **Q & M Industrial Company Limited**

Address : RM 1405A 14/F LUCKY CTR 165-171 WANCHAI RD WANCHAI
HONGKONG

Manufacturer : **Q & M Industrial Company Limited**

Address : RM 1405A 14/F LUCKY CTR 165-171 WANCHAI RD WANCHAI
HONGKONG

Test Result	PASS
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The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

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1. SUMMARY

1.1. EUT configuration

Kind of Product	Vault c-smart wireless 26950mah power pack
Model Name	RMC99701
Frequency Range	115-205KHz
Antenna Type	Loop Antenna
FCC ID	2AULO-RMC97701

1.2 Test Mode

Test Mode	
Mode1	Battery powered
Mode2	USB power supply (Other voltages have been tested and 20V-1 .5 A is the worst mode.)

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 (2013) and CISPR Publication 22.

2.2. Test Facility

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

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9518B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9518B on Jan. 22, 2019.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

2.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

2.4. Statement of the measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
total RF power, conducted	$\pm 1,5$ dB
RF power density, conducted	± 3 dB
spurious emissions, conducted	± 3 dB
all emissions, radiated	± 6 dB
temperature	$\pm 1^{\circ}\text{C}$
humidity	± 5 %
DC and low frequency voltages	± 3 %

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

According KDB 680106 D01 RF Exposure Wireless Charging Pad App v03

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

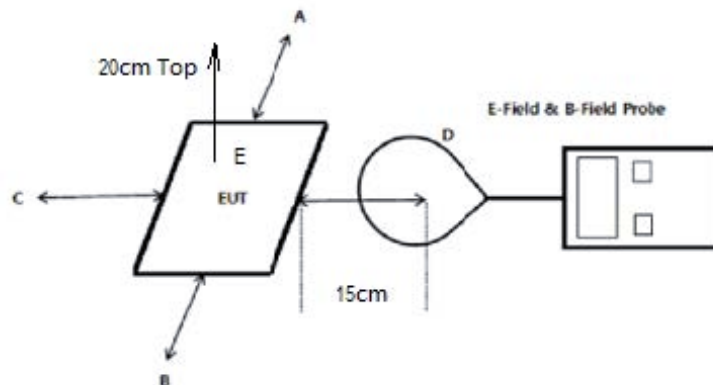
F=frequency in MHz

*=Plane-wave equivalent power density

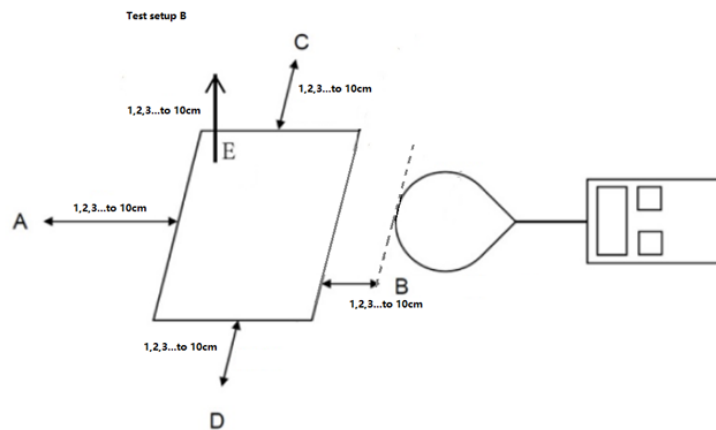
4. Test Result

4.1. Test Setup

A



B



- 1) The RF exposure test was performed in an echoic chamber;
- 2) The measurement probe was placed at test distance(15 cm from edges, 20 cm from top) Which is between the edge of the charger and the geometric center of probe, for test setup A;
- 3) In addition to what is described in KDB 680106 D01, please measure and provide magnetic and electrical field strength at a distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm. Which is between the edge of the charger and the edge of of probe, for test setup B;
- 4) The highest emission leve laws recorded and compared with limit as soon as measurement of each points (A,B, C,D, E)were completed;
- 5) The EUT was measured according to the dictates of KDB680106D01v03; And KDB Tracking Number 671578 ; TCB Workshop, October 2018, 5.2 RF Exposure Procedures .

Remark: The EUT' s test position A, B,C, D and E is valid for the E and H field measurements.

Note: A, B, C, D, E, F for six surfaces of the product.

4.2. Test Equipment

Equipment	Manufacturer	Model	Serial no.	Calibrated date	Calibrated until
E-Field Probe	HOLADAY	HI3637	00052130	2019.5.20	2020.5.19
H-Field Probe	HOLADAY	HI3637	00052130	2019.5.20	2020.5.19

4.3. Measurement Procedure

- a) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- b) The turn table was rotated 360 degree to search of highest strength.
- c) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.

- d) The EUT were measured according to the dictates of KDB 680106 D01 RF Exposure Wireless Charging Pad App v03.

4.4. Equipment Approval Considerations

The EUT does comply with KDB 680106 D01 RF Exposure Wireless Charging Pad App v03.

- (1) Power transfer frequency is less than 1 MHz. Comply.
- (2) Output power from each primary coil is less than or equal to 15 watts. Comply.
- (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. Comply.
- (4) Client device is placed directly in contact with the transmitter. Comply.
- (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion). Not comply.
- (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. Remark: Meet all the above requirements. Comply.

4.5. E and H field Strength

Test Result for Test setup A:

Both Mode1 and Mode2 have been tested, and the worst Mode is Mode1.

Mode1

E-Filed Strength at (15 cm from edges A,B,C,D, 20 cm from top E) surrounding the EUT (V/m)

Charging Load Worse case	Test Position A(V/m)	Test Position B(V/m)	Test Position C(V/m)	Test Position D(V/m)	Test Position E(V/m)	Limits (V/m)
<5%	1.37	1.18	1.24	1.28	0.98	614
50%	1.43	1.21	1.29	1.34	1.08	614
>90 %	1.24	1.35	1.19	1.24	1.06	614

H-Filed Strength at (15 cm from edges A,B,C,D, 20 cm from top E) surrounding the EUT (A/m)

Charging Load Worse case	Test Position A(A/m)	Test Position B(A/m)	Test Position C(A/m)	Test Position D(A/m)	Test Position E(A/m)	Limits (A/m)
<5%	0.246	0.249	0.228	0.237	0.263	1.63
50%	0.231	0.233	0.217	0.221	0.259	1.63
>90 %	0.223	0.228	0.208	0.215	0.251	1.63

Test Result for Test setup B: <5% ,50% ,>90% load all have been tested ,only worse case Max load is reported. Both Mode1 and Mode2 have been tested, and the worst Mode is Mode1. Only worse case is reported.

Mode1

E-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of of probe,) surrounding the EUT (V/m)

Test distance (cm)	Test Position A(V/m)	Test Position B(V/m)	Test Position C(V/m)	Test Position D(V/m)	Test Position E(V/m)	Limits (V/m)
1	10.404	10.526	10.840	11.736	8.404	614
2	10.112	9.626	9.736	9.892	7.916	614
3	9.815	8.511	8.524	8.619	7.236	614
4	9.406	7.629	7.715	7.891	6.358	614
5	8.902	5.411	5.985	6.120	5.725	614
6	7.893	5.667	5.713	5.819	5.651	614
7	6.416	5.486	5.528	5.629	5.526	614
8	5.320	5.386	5.439	5.528	5.438	614
9	5.363	4.826	5.358	4.991	5.369	614
10	4.944	4.407	5.250	4.684	5.135	614

H-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of of probe,) surrounding the EUT (A/m)

Test distance (cm)	Test Position A(A/m)	Test Position B(A/m)	Test Position C(A/m)	Test Position D(A/m)	Test Position E(A/m)	Limits (A/m)
1	0.372	0.350	0.329	0.330	0.402	1.63
2	0.352	0.341	0.319	0.315	0.398	1.63
3	0.336	0.329	0.311	0.310	0.392	1.63
4	0.324	0.318	0.283	0.314	0.386	1.63
5	0.319	0.313	0.276	0.304	0.382	1.63
6	0.306	0.309	0.264	0.308	0.375	1.63
7	0.258	0.255	0.252	0.273	0.322	1.63
8	0.254	0.251	0.248	0.271	0.316	1.63
9	0.251	0.245	0.246	0.268	0.308	1.63
10	0.248	0.237	0.234	0.251	0.298	1.63

5. Test Setup Photo

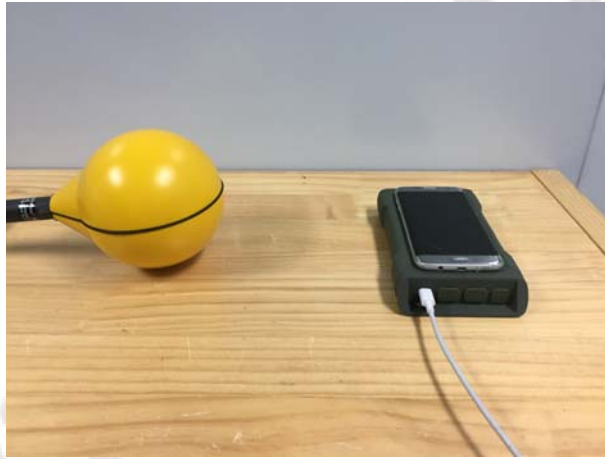
Mode1





Mode2





.....End of Report.....