

TEST REPORT

Reference No...... : WTD23D03038545W002
FCC ID : 2AL7Q-D1
Applicant..... : ShenZhen EBELONG Technology Co., Ltd
Address..... : 4th Floor, Building 2, Hengmingzhu Shajing Industrial Park, Baoan District, Shenzhen, Guangdong, China
Manufacturer : ShenZhen EBELONG Technology Co., Ltd
Address..... : 4th Floor, Building 2, Hengmingzhu Shajing Industrial Park, Baoan District, Shenzhen, Guangdong, China
Product..... : automatic switch magnet
Model(s) : D1, D2, D4, ED154, ED100, ED111, ED187, ED165, ED176, ED254, ED200, ED211, ED287, ED265, ED276, ED454, ED400, ED411, ED487, ED465, ED476
Standards..... : FCC 47CFR Part 2 Subpart J Section 2.1091
Date of Receipt sample : 2023-03-03
Date of Test : 2023-03-03 to 2023-03-08
Date of Issue..... : 2023-03-28
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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3. Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD23D03038545W002	2023-03-03	2023-03-03 to 2023-03-08	2023-03-28	Original	-	Valid

4. General Information

4.1. General Description of E.U.T.

Product Name:	automatic switch magnet
Model No.:	D1, D2, D4, ED154, ED100, ED111, ED187, ED165, ED176, ED254, ED200, ED211, ED287, ED265, ED276, ED454, ED400, ED411, ED487, ED465, ED476
Model Difference:	Only the model names and appearance colors are different for different market requirement. The model of test sample is D1.
Hardware Version:	0.8
Software Version:	1.0

4.2. Details of E.U.T.

Frequency Range:	433.301MHz
Type of Modulation:	FSK
Antenna installation:	Internal Integrated Antenna
Antenna Gain	2dBi
Power supply	Self-Powered

4.3. Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group 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 number 523476, September 10, 2019.

4.4. Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.5. Abnormalities from Standard Conditions

None.

5. Test Summary

Test Items	Test Requirement	Result
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	FCC Part 2.1091	PASS

6. RF Exposure

Test Requirement: FCC 47CFR Part 2 Subpart J Section 2.1091

Evaluation Method: FCC 47CFR Part 1 Subpart I Section 1.1310,
KDB 447498 D01 General RF Exposure Guidance v06

6.1. Requirements

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

6.2. The procedures / limit

Table 1 to § 1.1310(e)(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)
(i) 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	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) 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	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

6.3. MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = output power to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

From the peak EUT RF output power, the minimum mobile separation distance, R=20cm, as well as the gain of the used antenna, the RF power density can be obtained

6.4. Radio Frequency Radiation Exposure Evaluation

According to ANSI C63.10:2013 clause 9.5

Calculate the EIRP from the radiated field strength in the far field using Equation (22):

$$EIRP = E_{Meas} + 20 \log(d_{Meas}) - 104.7 \quad (22)$$

where

EIRP is the equivalent isotropically radiated power, in dBm
 E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m
 d_{Meas} is the measurement distance, in m

NOTE—Because this equation yields the identical result whether the field strength is extrapolated using the default 20 dB/decade of distance extrapolation factor, or the field strength is not extrapolated for distance, this equation can generally be applied directly (with no further correction) to determine EIRP. In some cases, a different distance correction factor may be required; see 9.1.

Frequency(MHz)	E-Field Strength (dBuV/m)	Measurement Distance (m)	EIRP (dBm)
433.301	86.58	3	-8.58

Frequency (MHz)	Max EIRP (dBm)	Max EIRP (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)
433.301	-8.58	0.14	0.00003	0.28887

Note:

1. Chose the maximum power to do MPE analysis.

Conclusion:

RF Exposure is FCC compliant.

=====End of Report=====