MPE Test Report

Report No.:STS2307145H01

Issued for

Litum bilgi teknolojileri san. Ve dis tic. A.S

Şevket Ozçelik sok. No29 Alsancak izmir 35000 Turkey

Product Name:	LITUM TAG CHARGER STATION
Brand Name:	Litum
Model Number:	900
Series Model(s):	N/A
FCC ID:	2AW7W-900
Test Standards:	FCC CFR 47 part 1, 1.1310

TEST REPORT

Applicant's Name ..... :	Litum bilgi teknolojileri san. Ve dis tic. A.S
Address..... :	Şevket Ozçelik sok. No29 Alsancak izmir 35000 Turkey
Manufacturer's Name ..... :	Litum bilgi teknolojileri san. Ve dis tic. A.S
Address..... :	Şevket Ozçelik sok. No29 Alsancak izmir 35000 Turkey
Product Description	
Product Name ..... :	LITUM TAG CHARGER STATION
Brand Name..... :	Litum
Model Name..... :	900
Series Model(s) ..... :	N/A
Test Standards..... :	FCC CFR 47 part 1, 1.1310
Test Procedure ..... :	680106 D01 RF Exposure Wireless Charging Apps v03

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :	
Date of receipt of test item..... :	31 July 2023
Date of performance of tests .. :	31 July 2023 ~ 13 Sept. 2023
Date of Issue..... :	13 Sept. 2023
Test Result ..... :	**Pass**

Testing Engineer : Aaron Bu

(Aaron Bu)

Technical Manager : Sean She

(Sean she)

Authorized Signatory : Chris Chen

(Chris Chen)

SHENZHEN STS TEST SERVICES CO., LTD. TESTING APPROVAL

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	13 Sept. 2023	STS2307145H01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
FCC KDB 680106 D01 RF Exposure Wireless Charging Apps v03

FCC CFR 47			
Standard Section	Test Item	Judgment	Remark
FCC CFR 47 part1, 1.1310 KDB680106 D01v03	Electric Field Strength (E) (V/m)	PASS	
	Magnetic Field Strength (H) (A/m)	PASS	

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

1.2 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	Uncertainly
1	H-filed	±0.83dB
2	E-filed	±0.91dB

1.3 GENERAL DESCRIPTION OF THE EUT

Product Name	LITUM TAG CHARGER STATION
Brand	Litum
Model Number	900
Series Model(s)	N/A
Model Difference	N/A
Equipemnt Category	Non-ISM frequency
Antenna Type	Coil Antenna
Operating frequency	110.5K-205K
Modulation Type	ASK
Rating	Input: 100-120V AC , 50-60Hz, 77W 220-240V AC, 50-60Hz, 77W Output: DC 9V,72W
Adapter	Input: 115/230V Output:12V
Hardware version number	01
Software version number	01
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	NOTE
1	Litum	900	Coil	N/A	Antenna
2	Litum	900	Coil	N/A	Antenna
3	Litum	900	Coil	N/A	Antenna
4	Litum	900	Coil	N/A	Antenna
5	Litum	900	Coil	N/A	Antenna
6	Litum	900	Coil	N/A	Antenna
7	Litum	900	Coil	N/A	Antenna
8	Litum	900	Coil	N/A	Antenna
9	Litum	900	Coil	N/A	Antenna
10	Litum	900	Coil	N/A	Antenna
11	Litum	900	Coil	N/A	Antenna
12	Litum	900	Coil	N/A	Antenna

13	Litum	900	Coil	N/A	Antenna
14	Litum	900	Coil	N/A	Antenna
15	Litum	900	Coil	N/A	Antenna
16	Litum	900	Coil	N/A	Antenna

3. Test Mode:

Test Mode	Description
Mode 1	Wireless charging Coil 1
Mode 2	Wireless charging Coil 2
Mode 3	Wireless charging Coil 3
Mode 4	Wireless charging Coil 4
Mode 5	Wireless charging Coil 5
Mode 6	Wireless charging Coil 6
Mode 7	Wireless charging Coil 7
Mode 8	Wireless charging Coil 8
Mode 9	Wireless charging Coil 9
Mode 10	Wireless charging Coil 10
Mode 11	Wireless charging Coil 11
Mode 12	Wireless charging Coil 12
Mode 13	Wireless charging Coil 13
Mode 14	Wireless charging Coil 14
Mode 15	Wireless charging Coil 15
Mode 16	Wireless charging Coil 16
Mode 17	Wireless charging Full Coil
Mode 18	Wireless charging Coil combination test

Note:

1. Coil combination test is both arbitrary coil combination, three coil, asymmetrical compositions, four coil combination, or any of the coil, coil of two coils, three, four coil, etc. With the combination of the other coil test
2. All mode has been tested, the worst case is Mode 17, this report only shown the worst case.


coil1
coil2
coil3
coil4
coil5
coil6
coil7
coil8
coil9
coil10
coil11
coil12
coil13
coil14
coil15
coil16

1.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Electric and Magnetic field Probe - Analyzer	Narda	EHP 200A	180ZX10220	2023.02.28	2024.02.27

1.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	load	Litum	631-0000026	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Note:

(1) For detachable type I/O cable should be specified the length in cm in『Length』column.
(2) “YES” is means “with core”; “NO” is means “without core”.

2. MAXIMUM PERMISSIBLE EXPOSURE

2.1 MAXIMUM PERMISSIBLE EXPOSURE

Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
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 General Population / Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	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	30

Note 1: f = frequency in MHz ; *Plane-wave equivalent power density

Note 2: For the applicable limit, see FCC 1.1310, 680106 D01 RF Exposure Wireless Charging Apps v03

Note 3: 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. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

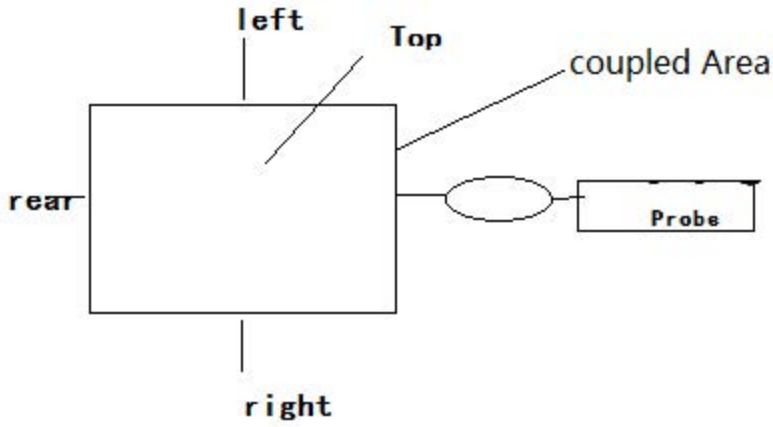
Note 4: The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

2.2 TEST PROCEDURE

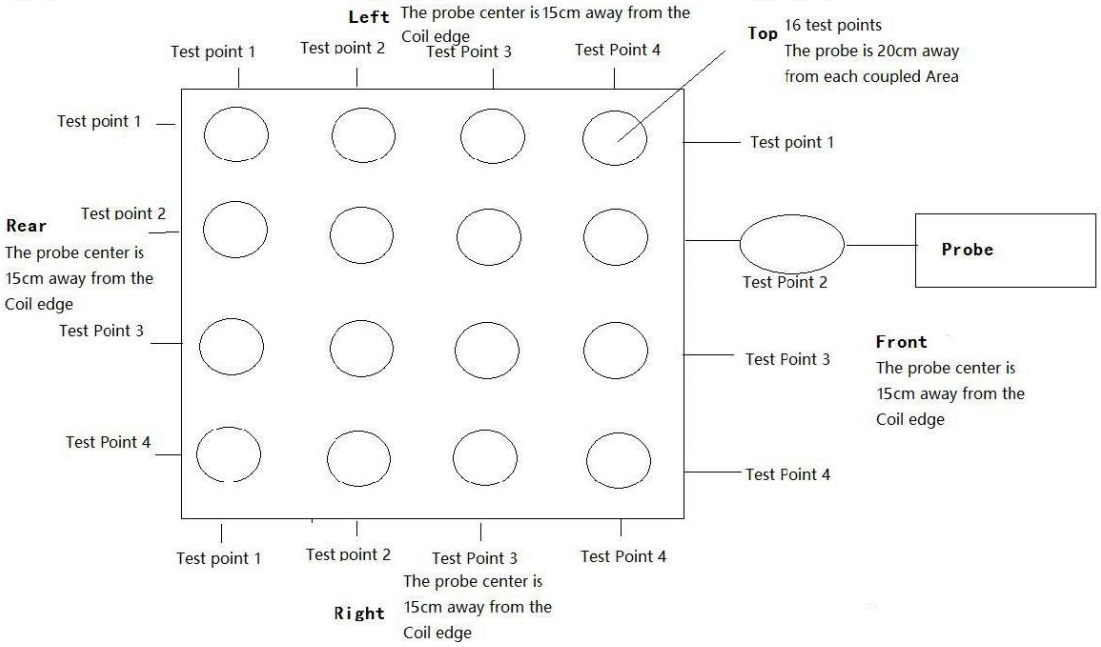
a. For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 20 cm(Top) and 15cm(Edge). E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 20 cm(Top) and 15cm(Edge) measured from the center of the probe(s) to the edge of the device.

2.3 TEST SETUP

FOR EACH COIL



FOR FULL COILS



Remark: The EHP 200A probe antenna diameter is less than 15cm.

2.4 TEST RESULTS

The EUT does comply with item 5 KDB680106 D01 v03.

(1) Power transfer frequency is less than 1 MHz.
RE: Yes, the EUT operating frequency is 110-205KHz.
(2) Output power from each primary coil is less than or equal to 15 watts.
Yes, the max wireless output from each 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, This includes WPT systems with multiple primary coils, each coil can only couple one client device.
(4) Client device is placed directly in contact with the transmitter.
RE: Yes, The WPT client device is placed in direct contact with the WPT source
(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
RE: Yes, The WPT systems is mobile device
(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 max leakage fields is 1.45%

2.5 MAXIMUM PERMISSIBLE EXPOSURE

Coil 1 MPE

Based On Nerve Stimulation				
	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
Charging AC 120V	15cm	Front	1.095	0.223
	15cm	Rear	1.096	0.232
	15cm	Left	1.085	0.216
	15cm	Right	1.105	0.204
	20cm	Top	1.143	0.205
Limit			83	90
Margin Limit (%)			1.38%	0.26%

Coil 2 MPE

Based On Nerve Stimulation				
	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
Charging AC 120V	15cm	Front	1.089	0.215
	15cm	Rear	1.091	0.220
	15cm	Left	1.073	0.213
	15cm	Right	1.092	0.189
	20cm	Top	1.137	0.201
Limit			83	90
Margin Limit (%)			1.31%	0.24%

Coil 3 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.086	0.218
	15cm	Rear	1.084	0.223
	15cm	Left	1.077	0.207
	15cm	Right	1.101	0.200
	20cm	Top	1.132	0.194
Limit			83	90
Margin Limit (%)			1.36%	0.25%

Coil 4 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.090	0.204
	15cm	Rear	1.087	0.208
	15cm	Left	1.070	0.201
	15cm	Right	1.098	0.194
	20cm	Top	1.139	0.190
Limit			83	90
Margin Limit (%)			1.37%	0.23%

Coil 5 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.089	0.211
	15cm	Rear	1.083	0.218
	15cm	Left	1.073	0.208
	15cm	Right	1.097	0.199
	20cm	Top	1.134	0.200
Limit			83	90
Margin Limit (%)			1.37%	0.24%

Coil 6 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.090	0.220
	15cm	Rear	1.082	0.227
	15cm	Left	1.076	0.206
	15cm	Right	1.097	0.195
	20cm	Top	1.132	0.193
Limit			83	90
Margin Limit (%)			1.36%	0.25%

Coil 7 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.084	0.213
	15cm	Rear	1.082	0.218
	15cm	Left	1.079	0.201
	15cm	Right	1.091	0.194
	20cm	Top	1.137	0.199
Limit			83	90
Margin Limit (%)			1.37%	0.24%

Coil 8 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.090	0.208
	15cm	Rear	1.089	0.227
	15cm	Left	1.080	0.212
	15cm	Right	1.092	0.194
	20cm	Top	1.129	0.191
Limit			83	90
Margin Limit (%)			1.36%	0.25%

Coil 9 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.081	0.211
	15cm	Rear	1.088	0.221
	15cm	Left	1.074	0.208
	15cm	Right	1.096	0.197
	20cm	Top	1.134	0.194
Limit			83	90
Margin Limit (%)			1.37%	0.25%

Coil 10 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.085	0.214
	15cm	Rear	1.083	0.221
	15cm	Left	1.073	0.213
	15cm	Right	1.090	0.193
	20cm	Top	1.136	0.194
Limit			83	90
Margin Limit (%)			1.37%	0.25%

Coil 11 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.088	0.220
	15cm	Rear	1.091	0.228
	15cm	Left	1.078	0.213
	15cm	Right	1.092	0.195
	20cm	Top	1.134	0.196
Limit			83	90
Margin Limit (%)			1.37%	0.25%

Coil 12 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.081	0.209
	15cm	Rear	1.085	0.223
	15cm	Left	1.079	0.202
	15cm	Right	1.097	0.195
	20cm	Top	1.128	0.192
Limit			83	90
Margin Limit (%)			1.36%	0.25%

Coil 13 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.087	0.219
	15cm	Rear	1.084	0.229
	15cm	Left	1.072	0.212
	15cm	Right	1.092	0.192
	20cm	Top	1.134	0.201
Limit			83	90
Margin Limit (%)			1.37%	0.25%

Coil 14 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	1.080	0.209
	15cm	Rear	1.083	0.223
	15cm	Left	1.076	0.211
	15cm	Right	1.095	0.196
	20cm	Top	1.135	0.202
Limit			83	90
Margin Limit (%)			1.37%	0.25%

Coil 15 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	E-field (V/m)	H-field (A/m)
	15cm	Rear	1.088	0.219
	15cm	Left	1.081	0.220
	15cm	Right	1.080	0.212
	20cm	Top	1.093	0.190
Limit			83	90
Margin Limit (%)			1.37%	0.24%

Coil 16 MPE

Based On Nerve Stimulation				
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)
	15cm	Front	E-field (V/m)	H-field (A/m)
	15cm	Rear	1.083	0.219
	15cm	Left	1.082	0.220
	15cm	Right	1.078	0.212
	20cm	Top	1.098	0.190
Limit			83	90
Margin Limit (%)			1.37%	0.24%

Full Coil_Front_MPE

Based On Nerve Stimulation						
Charging AC 120V	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)	E-field (V/m) Spatial Averaging	H-field (A/m) Spatial Averaging
	15cm	1	1.095	0.223	1.090	0.212
	15cm	2	1.089	0.215		
	15cm	3	1.086	0.218		
	15cm	4	1.090	0.190		
Limit					83	90
Margin Limit (%)					1.31%	0.24%

Full Coil_Rear MPE

Based On Nerve Stimulation						
Charging	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)	E-field (V/m) Spatial Averaging	H-field (A/m) Spatial Averaging
AC 120V	15cm	1	1.096	0.232	1.090	0.221
	15cm	2	1.091	0.220		
	15cm	3	1.084	0.223		
	15cm	4	1.087	0.208		
Limit					83	90
Margin Limit (%)					1.31%	0.25%

Full Coil_Left MPE

Based On Nerve Stimulation						
Charging	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)	E-field (V/m) Spatial Averaging	H-field (A/m) Spatial Averaging
AC 120V	15cm	1	1.085	0.216	1.076	0.209
	15cm	2	1.073	0.213		
	15cm	3	1.077	0.207		
	15cm	4	1.070	0.201		
Limit					83	90
Margin Limit (%)					1.30%	0.23%

Full Coil_Right MPE

Based On Nerve Stimulation						
Charging	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)	E-field (V/m) Spatial Averaging	H-field (A/m) Spatial Averaging
AC 120V	15cm	1	1.105	0.204	1.099	0.197
	15cm	2	1.092	0.189		
	15cm	3	1.101	0.200		
	15cm	4	1.098	0.194		
Limit					83	90
Margin Limit (%)					1.32%	0.22%

Full Coil_Top MPE

Based On Nerve Stimulation						
	Separation	Probe from EUT Side	E-field (V/m)	H-field (A/m)	E-field (V/m) Spatial Averaging	H-field (A/m) Spatial Averaging
Charging AC 120V	20cm	1	1.143	0.232	1.205	0.236
	20cm	2	1.128	0.220		
	20cm	3	1.132	0.223		
	20cm	4	1.139	0.208		
	20cm	5	1.134	0.218		
	20cm	6	1.132	0.227		
	20cm	7	1.137	0.218		
	20cm	8	1.129	0.227		
	20cm	9	1.134	0.221		
	20cm	10	1.136	0.221		
	20cm	11	1.134	0.228		
	20cm	12	1.128	0.223		
	20cm	13	1.134	0.229		
	20cm	14	1.135	0.223		
	20cm	15	1.137	0.220		
	20cm	16	1.134	0.220		
Limit					83	90
Margin Limit (%)					1.45%	0.26%

Full Coil Ns

Maximum Permissible Exposure					
	Charing coil	E-field Ratio	H-field Ratio	Full E-field Ratio	Full H-field Ratio
Charging AC 120V	1	0.014	0.003	0.21	0.04
	2	0.014	0.002		
	3	0.014	0.002		
	4	0.014	0.002		
	5	0.014	0.002		
	7	0.014	0.002		
	8	0.014	0.003		
	9	0.014	0.002		
	10	0.014	0.002		
	11	0.014	0.003		
	12	0.014	0.002		
	13	0.014	0.003		
	14	0.014	0.002		
	15	0.014	0.002		
	16	0.014	0.002		
Limit				1	1

Note:

1. The test frequency Coil 1 = 129KHz. Coil 2 = 127KHz Coil 3 = 127KHz Coil 4 = 125KHz Coil 5 = 128KHz Coil 6 = 128KHz Coil 7 = 132KHz Coil 8 = 131KHz Coil 9 = 126KHz Coil 10 = 128KHz Coil 11 = 119KHz Coil 12 = 133KHz Coil 13 = 125KHz Coil 14 = 123KHz Coil 15 = 130KHz Coil 16 = 128KHz

2. The fundamental is at least 20dB higher than the other spursious, so the strength and signal strength of the extra points of the frequency point are directly judged, and there is no need to measure the strength of multiple ranges to calculate the combined value.

3. Multiple transmission Limit= Coil 1/Limit+ Coil 2/Limit+ Coil 3/Limit+ Coil 4/Limit+ Coil 5/Limit+ Coil 6/Limit+ Coil 7/Limit+ Coil 8/Limit+ Coil 9/Limit+ Coil 10/Limit+ Coil 11/Limit+ Coil 12/Limit+ Coil 13/Limit+ Coil 14/Limit+ Coil 15+ Coil 16/Limit＜1

MPE SETUP PHOTO

Front-Coil 1

Front-Coil 2

Front-Coil 3

Front-Coil 4

Left-Coil 1

Left-Coil 2

Left-Coil 3

Left-Coil 4

Rear-Coil 1

Rear-Coil 2

Rear-Coil 3

Rear-Coil 4

Right-Coil 1

Right-Coil 2

Right-Coil 3

Right-Coil 4

Top-Coil 1

Top-Coil 2

Top-Coil 3

Top-Coil 4

Top-Coil 5

Top-Coil -6

Top-Coil 7

Top-Coil 8

Top-Coil 9

Top-Coil 10

Top-Coil 11

Top-Coil 12

Top-Coil 13

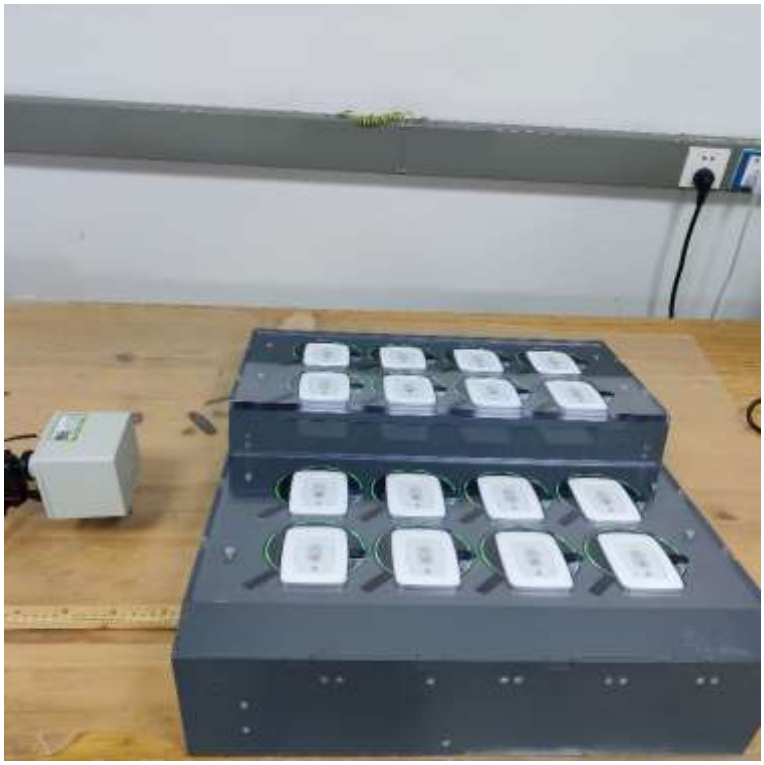
Top-Coil 14

Top-Coil 15

Top-Coil 16

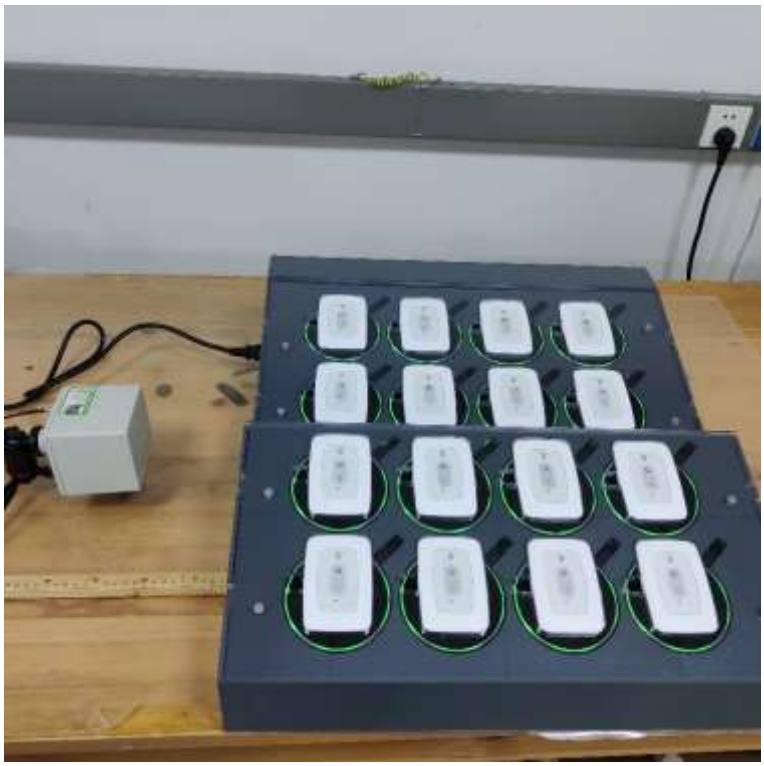
Front

Left

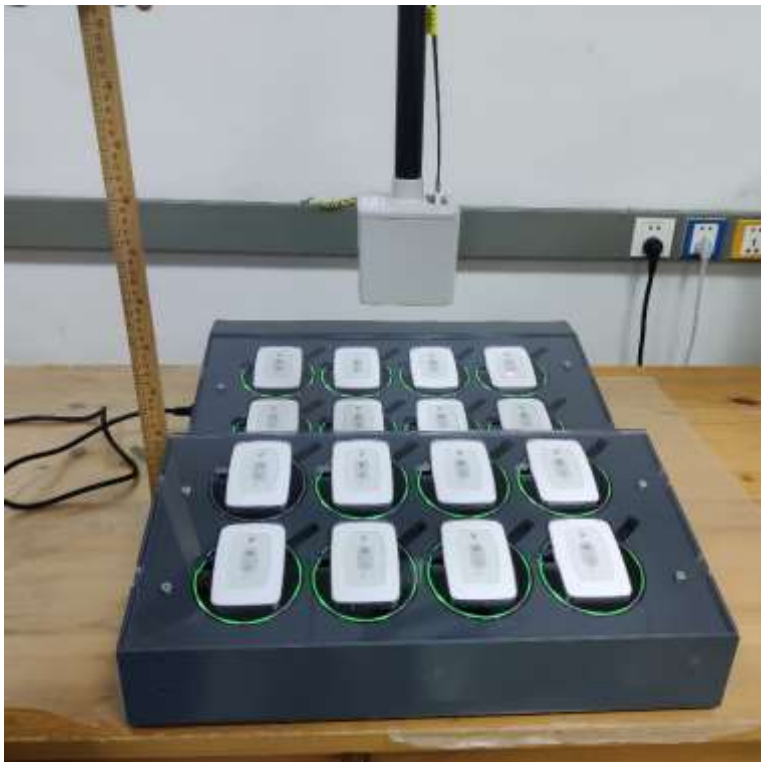


REAR

Right



TOP



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