

EMC TEST REPORT

Report Number : E202505010-E01

Applicant Name : Jiangsu DINGS' Intelligent Control Technology Co., Ltd.

Product Name : PM Stepper Linear Actuator

Model Name : E15PC34-1-12-23.9-001,E,N,K

Date of issue : 2025-05-30

Shanghai Long Test Technology Co., Ltd.



Tested by: Dai Pan Reviewed by: Liu Yongqiang Approved by: Yu Qilei

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1 GENERAL DISCLAIMER

- (1) The report is invalid if it is not stamped with the "special seal for testing" or "paging seal".
- (2) The report is invalid without the signature of the test, review and approval person.
- (3) The report is invalid after being redacted.
- (4) The report applies only to the sample being tested.
- (5) This report cannot be reproduced except in full, without prior written approval of the company.
- (6) Any dissent for the test report, please send the written notice within 15 days from the date of receipt of the report.
- (7) Items added with "*" means subcontracted inspection items, and items added with "☆" means testing items not within the scope of CNAS or CMA qualification recognition.
- (8) Only for scientific research, teaching or internal quality control without "CMA" seal, and is unlawful.
- (9) The sample(s) will be retained for three months after applicant received the test report.

2 GENERAL INFORMATION

Report No.	Version	Issued Date	Description
E202505010-E01	Rev.01	2025-05-30	First edition

3 TEST LOCATION

Testing Laboratory : Shanghai long test Technology Co., LTD.
Laboratory address : Room 110, Building 4, 3836 Zhaolou Road,
Minhang District, Shanghai
Phone : +86-021-67281282
Website : <http://www.longtest.ltd>



4 GENERAL INFORMATION

Name of applicant : Jiangsu DINGS' Intelligent Control Technology Co., Ltd.

Applicant's address : No. 2850 Luheng Road, Economic Development Zone,
Changzhou, Jiangsu, 213025 China

Manufacturer's name : Jiangsu DINGS' Intelligent Control Technology Co., Ltd.

Manufacturer's address : No. 2850 Luheng Road, Economic Development Zone,
Changzhou, Jiangsu, 213025 China

Type of Test : Entrusted Testing Type Testing

Testing Standard : EN IEC 61000-6-3:2021
(CISPR 16-2-3:2016+A1:2019+A2:2023)
EN IEC 61000-6-1:2019
(IEC 61000-4-2:2008,IEC 61000-4-3:2020 ,IEC 61000-4-6:2023,IEC 61000-4-8:2009)

Test Result : Pass

Test Date : 2025-05-21

Report Date : 2025-05-30

5 SAMPLE INFORMATION

Sample Name : PM Stepper Linear Actuator

Main Test Type : E15PC34-1-12-23.9-001,E,N,K

Serial Model No. : /

Model Difference : /

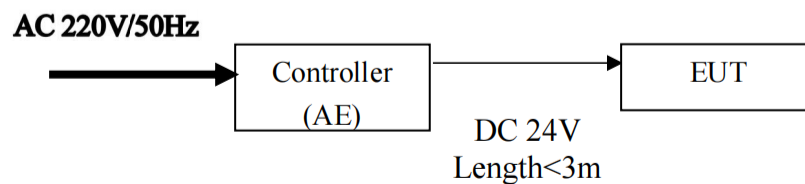
Highest Clock Frequency : <108MHz

Test setup : Table-top Floor-standing Other:

Power Supply : DC24V

Test Mode : Running:Power on and working continuously.

6 BLOCK OF DIAGRAM



No.	Name	Type	Note
1	Controller	DS-2422-001	AE
2	Motor	PM Stepper Linear Actuator	EUT

7 TEST SUMMARY AND TECHNICAL INFORMATION

7.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description of Test Item		Standard(Method)	Test Requirement	Results
EMI	Radiated Disturbance	EN IEC 61000-6-3:2021 (CISPR 16-2-3:2016 +A1:2019+A2:2023)	Table 3	Pass
	Conducted Disturbance at AC Power Ports	EN IEC 61000-6-3:2021 (CISPR 16-2-1:2014+A1:2017)	Table 4	N/A
Description of Test Item		Standard(Method)	Performance Criteria	Results
EMS	Electrostatic Discharge (ESD)	EN IEC 61000-6-1:2019 (IEC 61000-4-2:2008)	Table 1.4 B	Pass
	Radio frequency electromagnetic field	EN IEC 61000-6-1:2019 (IEC 61000-4-3:2020)	Table 1.2/3 A	Pass
	Fast Transients (EFT)	EN IEC 61000-6-1:2019 (IEC 61000-4-4:2012)	Table 4.5 B	N/A
	Surge Immunity	EN IEC 61000-6-1:2019 (IEC61000-4-5:2014+A1:2017)	Table 4.4 B	N/A
	Radio frequency common mode	EN IEC 61000-6-1:2019 (IEC 61000-4-6:2023)	Table 4.1 A	N/A
	Power-frequency magnetic field	EN IEC 61000-6-1:2019 (IEC 61000-4-8:2009)	Table 1.1 A	Pass
	Voltage dips& Voltage interruptions	EN IEC 61000-6-1:2019 (IEC 61000-4-11:2020)	Table 4.2/3 B/C/C/C	N/A

7.2 Description of Performance Criteria

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing, shall be provided by the manufacturer and noted in the test report, based on the following criteria:

7.2.1 Performance criterion A

The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

7.2.2 Performance criterion B

The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

7.2.3 Performance criterion C

Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

If, as a result of the application of the tests defined in this standard, the EUT becomes dangerous or unsafe, it shall be deemed to have failed the test.

7.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Shielding1	Conducted emission (150KHz~30MHz): 2.86dB
Chamber1	Radiated emission (30MHz~200MHz): 3.86 dB (Horizontal)
	Radiated emission (30MHz~200MHz): 4.26 dB (Vertical)
	Radiated emission (200MHz~1000MHz): 4.20 dB (Horizontal)
	Radiated emission (200MHz~1000MHz): 5.02 dB (Vertical)
Chamber2	Radiated emission (30MHz~200MHz): 4.00 dB (Horizontal)
	Radiated emission (30MHz~200MHz): 4.38 dB (Vertical)
	Radiated emission (200MHz~1000MHz): 4.24 dB (Horizontal)
	Radiated emission (200MHz~1000MHz): 5.12 dB (Vertical)

Radiated emission for this report is tested in: Chamber1

7.4 TEST EQUIPMENT

7.4.1 For Radiated Disturbance Test (Below 1GHz)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESR7	102672	Jul 08, 2024	Jul 07, 2025
2.	Test Receiver	Keysight	N9020A	MY51286657	Jul 08, 2024	Jul 07, 2025
3.	Antenna	SCHWARZB ECK	VULB 9162	00468	Jul 10, 2024	Jul 09, 2025
4.	Antenna	SCHWARZB ECK	VULB 9168	01527	Jul 10, 2024	Jul 09, 2025
5.	Software	Audix	e3	221118	/	/

7.4.2 For Electrostatic Discharge Immunity Test

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	ESD Simulator	ENNING	ESDE 30K	SX042301A3	Jul 08, 2024	Jul 07, 2025

7.4.3 For RF Electromagnetic Field Immunity Test

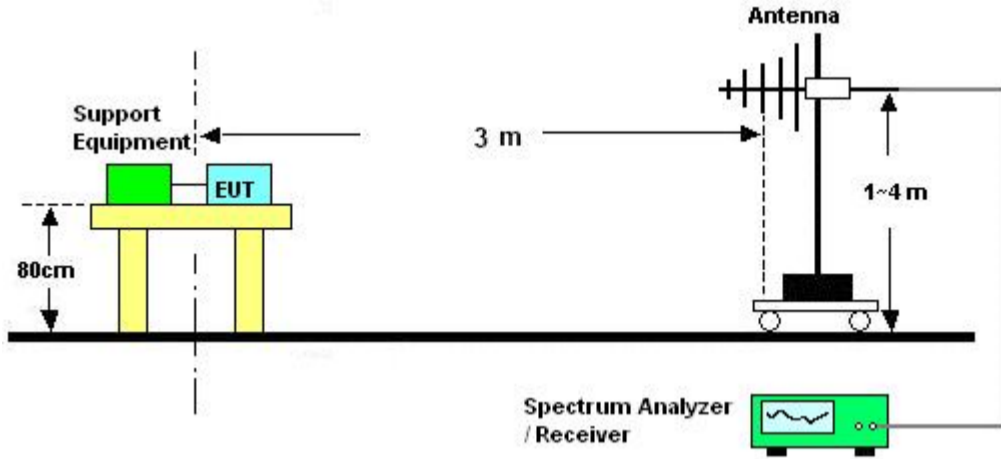
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Amplifier	RFLIGHT	NTWPA- 00810500	22113305	Jul 08, 2024	Jul 07, 2025
2.	Power Amplifier	RFLIGHT	NTWPA- 1060100P	22093261	Jul 08, 2024	Jul 07, 2025
3.	Signal generator	KEYSIGHT	N5171B	MY6125022 8	Jul 08, 2024	Jul 07, 2025
4.	Antenna	SCHWARZB ECK	STLP 9149	00867	Jul 08, 2024	Jul 07, 2025
5.	Antenna	SCHWARZB ECK	STLP 9128E	3331	Jul 08, 2024	Jul 07, 2025

7.4.4 For Power Frequency Magnetic Field Immunity Test

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power frequency magnetic field generator	ENNING	PFME 1200	SX022301G1	Jul 08, 2024	Jul 07, 2025

8 RADIATED DISTURBANCE TEST

8.1 Block Diagram of Test Setup



8.2 Applicable Standard

EN IEC 61000-6-3:2021(CISPR 16-2-3:2016+A1:2019+A2:2023)

8.3 Limits for Radiated Disturbance

All devices shall not exceed the level of field strengths specified below:

Frequency (MHz)	Distance (m)	Field Strength Limits dB(μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

NOTE 1 – The tighter limit applies at the edge between two frequency bands.
 NOTE 2 – Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

8.4 EUT Configuration

The EUT and peripherals were installed as shown on Sec.8.1 and operating in a manner which tends to maximize its disturbance level in a normal application.

8.5 Test Procedure

The EUT and peripherals were placed upon a turntable 0.8 m above the horizontal metal ground plane. All cables leaving the tabletop EUT for a connection outside the test site shall be fitted with ferrite clamps placed on the floor at the point where the cable reaches the floor. The turntable rotated 360 degrees to determine the position of the maximum emission level. The

EUT was set 3 meters below 1 GHz away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna or horn Antenna) was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of interface cables were manipulated during radiated test.

The bandwidth of Test Receiver R&S ESR was set at 120 kHz below 1GHz.

The frequency range from 30 MHz to 1000MHz was checked for the test modes.

8.6 Test Results

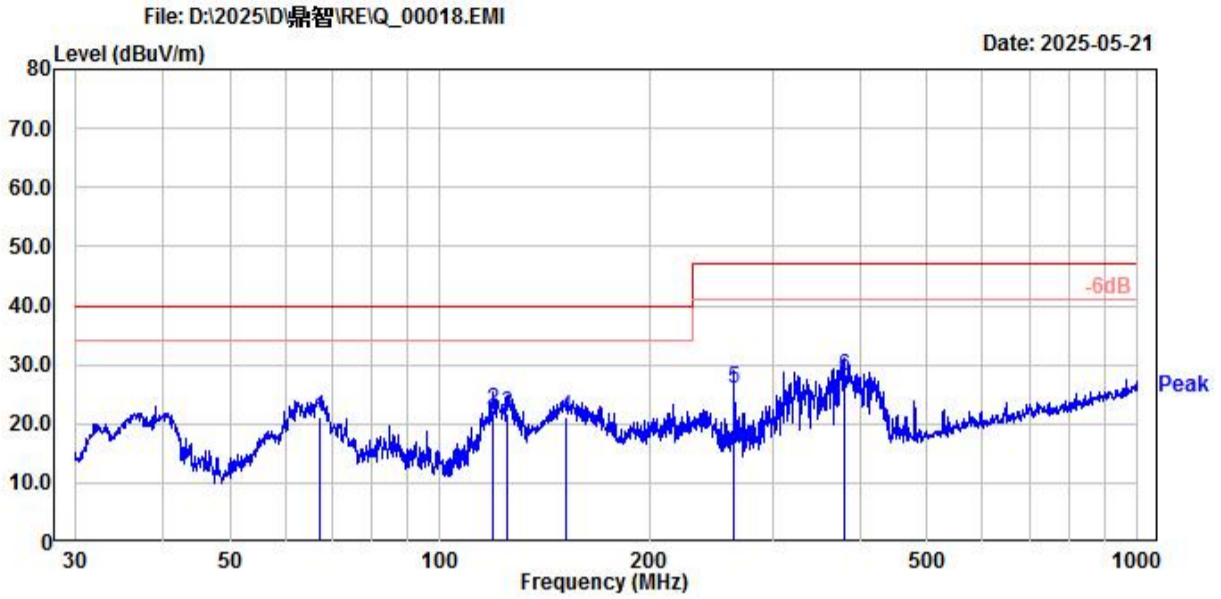
<PASS>

All the following records are the disturbance levels and the frequencies of the highest disturbances, and if the disturbance not reported below are too low against the prescribed limits.

NOTE 1 – All reading are Quasi-Peak values below or equal to 1GHz.

NOTE 2 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

TEST DATA

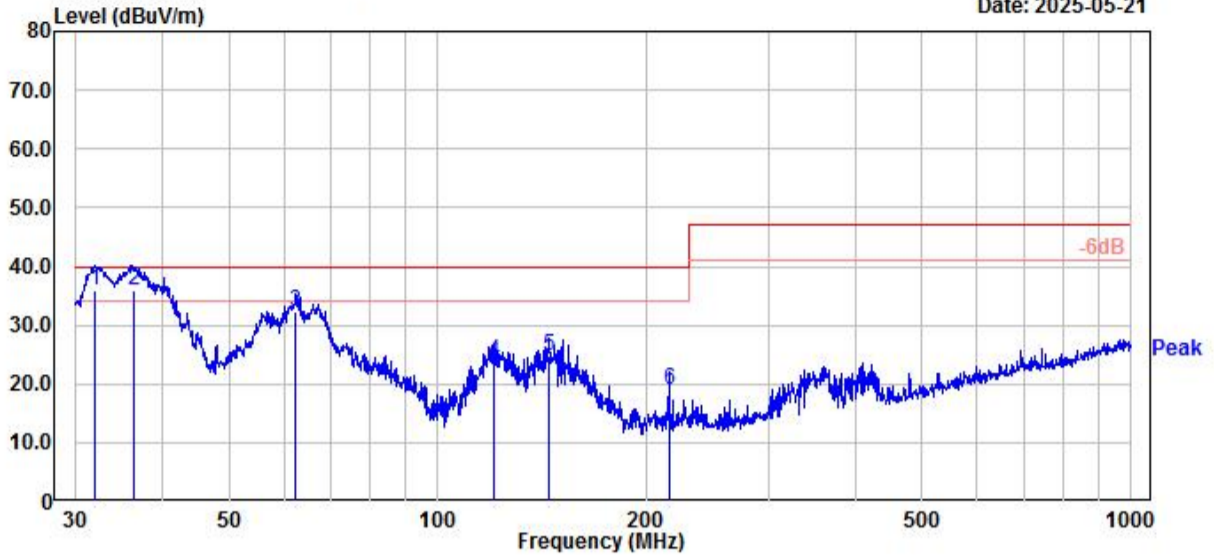


Condition : 3m VULB9162-2024 Horizontal
 : DET:Peak
 Applicant :
 EUT : E15PC34-1-12-23.9-001,E,N,K
 M/N :
 S/N :
 Power Supply :
 Ambient : 25'C/54%RH/101.8kPa
 Test Mode :
 Test Engineer: DP
 Memo :

	Freq	Level	Read Level	Limit Line	Over Limit	Ant Factor	Cable Loss	Remark	APos	TPos
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1	67.422	21.11	10.44	40.00	-18.89	9.38	1.29	QP	100	315
2	119.038	22.42	10.68	40.00	-17.58	10.05	1.69	QP	200	140
3	124.957	21.67	10.71	40.00	-18.33	9.26	1.70	QP	200	127
4	151.726	21.17	11.11	40.00	-18.83	8.28	1.78	QP	200	124
5	263.819	25.92	11.31	47.00	-21.08	12.50	2.11	QP	100	37
6	380.175	28.12	10.99	47.00	-18.88	14.68	2.45	QP	200	95

File: D:\2025\鼎智\RE\Q_00019.EMI

Date: 2025-05-21

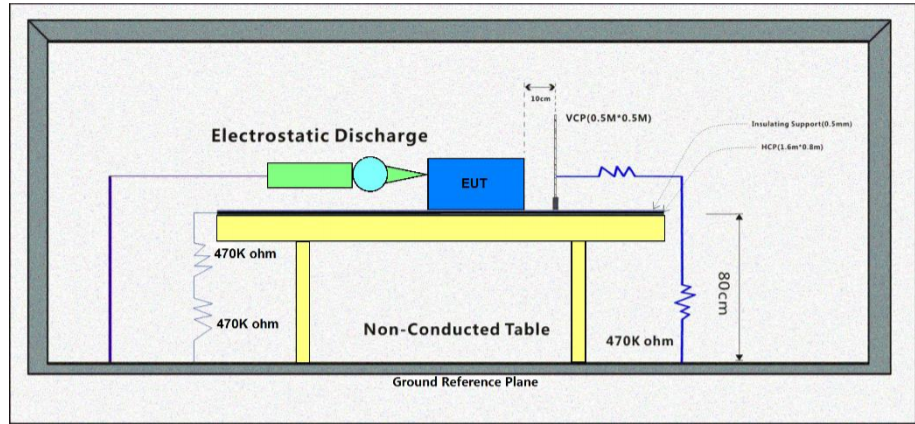


Condition : 3m VULB9162-2024 Vertical
 : DET:Peak
 Applicant :
 EUT : E15PC34-1-12-23.9-001,E,N,K
 M/N :
 S/N :
 Power Supply :
 Ambient : 25'C/54%RH/101.8kPa
 Test Mode :
 Test Engineer: DP
 Memo :

	Freq	Level	Read Level	Limit Line	Over Limit	Ant Factor	Cable Loss	Remark	APos	TPos
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1	31.972	36.03	25.05	40.00	-3.97	10.05	0.93	QP	101	117
2	36.457	35.79	23.51	40.00	-4.21	11.31	0.97	QP	100	177
3	62.322	32.39	19.92	40.00	-7.61	11.23	1.24	QP	100	146
4	120.911	23.81	11.77	40.00	-16.19	10.35	1.69	QP	100	203
5	145.096	24.82	14.41	40.00	-15.18	8.65	1.76	QP	100	177
6	215.646	18.89	4.86	40.00	-21.11	12.06	1.97	QP	100	59

9 ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1 Block Diagram of Test Setup



9.2 Applicable Standard

EN IEC 61000-6-1:2019(IEC 61000-4-2:2008)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity levels

Test Voltage			
Contact Discharge (kV)		Air Discharge (kV)	
<input type="checkbox"/>	2	<input type="checkbox"/>	2
<input checked="" type="checkbox"/>	4	<input type="checkbox"/>	4
<input type="checkbox"/>	6	<input checked="" type="checkbox"/>	8
<input type="checkbox"/>	8	<input type="checkbox"/>	15
<input type="checkbox"/>		<input type="checkbox"/>	

9.3.2 Performance criterion:

 A B C

9.4 EUT Configuration

The EUT and peripherals were installed as shown on Sec.9.1 and operating in a normal application.

9.5 Test Procedure

The test applied a non-conductive surface and a horizontal coupling plane on a wooden support, 0.8 m high, standing on the reference ground plane, which is a 2 m x 3 m metallic sheet with 1.5 mm thickness.

9.5.1 Contact Discharge

The tip of the discharge electrode should touch the EUT, before the discharge switch was operated. The EUT shall be exposed to at least 20 discharges, 10 each at negative and positive polarity, at a minimum of four test points (a minimum of 10 discharges at each point). One of the test points shall be subjected to at least 10 indirect discharges (contact) to the center of the front edge of the horizontal coupling plane. If no direct contact test points are available, then at least 20 indirect discharges shall be applied in the indirect mode (use of the Vertical Coupling Plane)

9.5.2 Vertical Coupling Plane (VCP)

More than 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5 m x 0.5 m, was placed parallel to, and positioned at a distance of 0.1 m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that all sides of the EUT were completely illuminated.

9.5.3 Air Discharge

The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the ESD simulator (discharge electrode) was removed from the EUT. The simulator was then re-triggered for a new single discharge and applies more than 10 times on each reselected point. This procedure was repeated until the air discharge completed.

9.6 Test Results

<PASS>

Refer to the following pages.

For EMS tests, following test modes were selected to test.

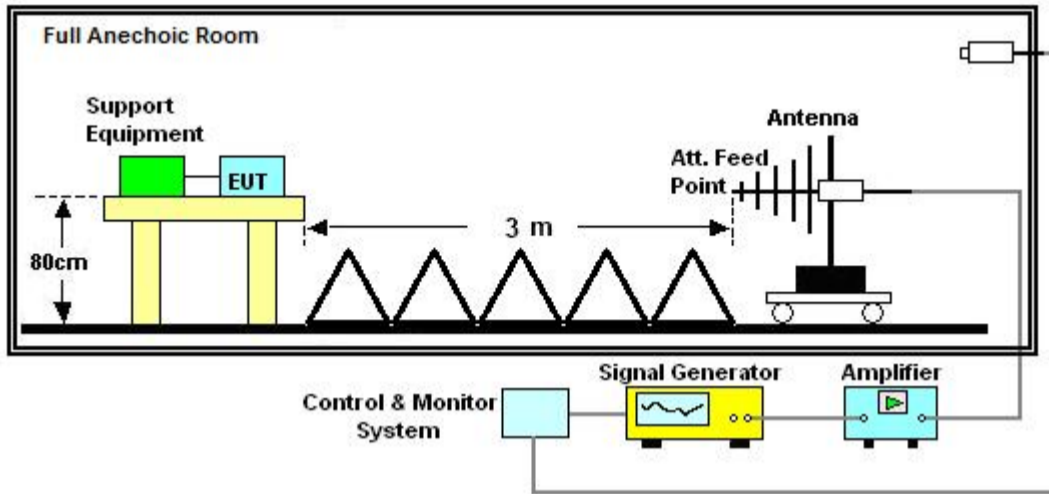
Electrostatic Discharge Immunity Test Result

Shanghai Long Test Technology Co.,Ltd.

Applicant : <u>Jiangsu DINGS' Intelligent Control Technology Co., Ltd.</u>	Test Date : <u>2025.05.21</u>			
EUT : <u>PM Stepper Linear Actuator</u>	Temperature : <u>24.1°C</u>			
M/N : <u>E15PC34-1-12-23.9-001,E,N,K</u>	Humidity : <u>50%RH</u>			
S/N : <u>/</u>	Atmospheric Pressure : <u>101.8 kPa</u>			
Power Supply : <u>DC 24V</u>	Test Mode : <u>Running</u>			
Contact Discharge Voltage: $\pm 2\text{ kV}, \pm 4\text{ kV}$	Air Discharge Voltage: $\pm 2\text{ kV}, \pm 4\text{ kV}, \pm 8\text{ kV}$			
Contact Discharge: For each point positive 10 times and negative 10 times discharge	Air Discharge: For each point positive 10 times and negative 10 times discharge			
Location	Point(s)	Kind	Result	
1	HCP	2	C	A/PASS
2	VCP	2	C	A/PASS
3	Metal shell	2	C	A/PASS
5	plastic	2	A	A/PASS
NOTE 1 – A (Air Discharge), C (Contact Discharge)				
NOTE 2 – VCP (Vertical Coupling Plane)				
Test result A indicates that there is no abnormality in the work.				

10 RF ELECTROMAGNETIC FIELD IMMUNITY TEST

10.1 Block Diagram of Test Setup



10.2 Applicable Standard

EN IEC 61000-6-1:2019(IEC 61000-4-3:2020)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity levels

Frequency Range MHz	Field Strength V/m	Modulation	Dwell Time Sec.
80-1000	3	80% AM 1 kHz	3
1400-6000	3	80% AM 1 kHz	3

10.3.2 Performance criterion:

■ A □ B □ C

10.4 EUT Configuration

The EUT and peripherals were installed as shown on Sec.10.1 and operating in a normal application.

10.5 Test Procedure

The EUT was placed on a wooden support, 0.8 m high, standing on the ground reference plane.

The power meter was used to measure the forward power. The EUT was set 3 m from the transmitting antenna. Both horizontal and vertical polarization of the antenna was set on test. Each side of the EUT was faced to the transmitting antenna and measured individually.

A CCD camera was put inside the chamber and through its display to monitor the operational

situation of the EUT to judge the EUT performance criterion during test.

10.6 Test Results

<PASS>

Refer to the following pages.

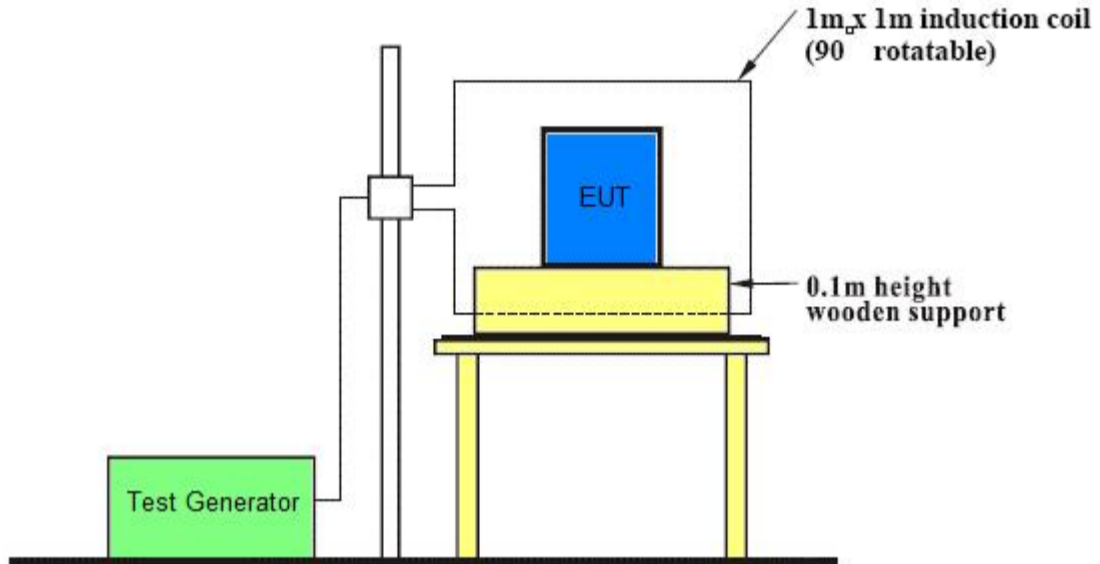
RF Field Strength Susceptibility Immunity Test Result

Shanghai Long Test Technology Co.,Ltd.

Applicant	Jiangsu DINGS' Intelligent Control Technology Co., Ltd.	Test Date	2025.05.21	
EUT	PM Stepper Linear Actuator	Temperature	24.1°C	
M/N	E15PC34-1-12-23.9-001,E,N,K	Humidity	50%RH	
S/N	/	Atmospheric Pressure	101.8 kPa	
Power Supply	DC 24V	Field Strength	3 V/m;	
Test Mode	Running	Modulation	<input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM	
Frequency Range	80 MHz to 1000 MHz		1400MHz to 6000 MHz	
Field Strength	3 V/m		3 V/m	
Modulation	80% AM 1 kHz		80% AM 1 kHz	
Steps	1 %		1 %	
Dwell Time	3 s		3 s	
Antenna Polarization	Horizontal	Vertical	Horizontal	Vertical
EUT Position	Front	A/PASS	A/PASS	A/PASS
	Rear	A/PASS	A/PASS	A/PASS
	Right	A/PASS	A/PASS	A/PASS
	Left	A/PASS	A/PASS	A/PASS
NOTE – “--” means the item is no applicable.				
Test result A indicates that there is no abnormality in the work.				

11 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

11.1 Block Diagram of Test Setup



11.2 Applicable Standard

EN IEC 61000-6-1:2019 (IEC 61000-4-8:2009)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level:

	Test Level	Magnetic field strength A/m
<input type="checkbox"/>	1	1
<input checked="" type="checkbox"/>	2	3
<input type="checkbox"/>	3	10
<input type="checkbox"/>	4	30
<input type="checkbox"/>	5	100
<input type="checkbox"/>	X	Special

11.3.2 Performance criterion:

 A B C

11.4 EUT Configuration

The configuration of the EUT is refer to Sec. 11.1.

11.5 Test Procedure

The EUT placed on high 0.8m wooden support that above the ground reference plane which the min. size 1m × 1m and 1.2mm thickness metallic, and subjected to the test magnetic field by using the induction coil of standard dimensions (1m × 1m) for proximity method. The induction coil rotated by 90 degrees in order to expose the EUT to the test field with different orientations. All cables of EUT exposed to magnetic field for 1m of their length.

11.6 Test Results

<PASS>

Refer to the following pages.

Power Frequency Magnetic Field Immunity Test Result

Shanghai Long Test Technology Co.,Ltd.

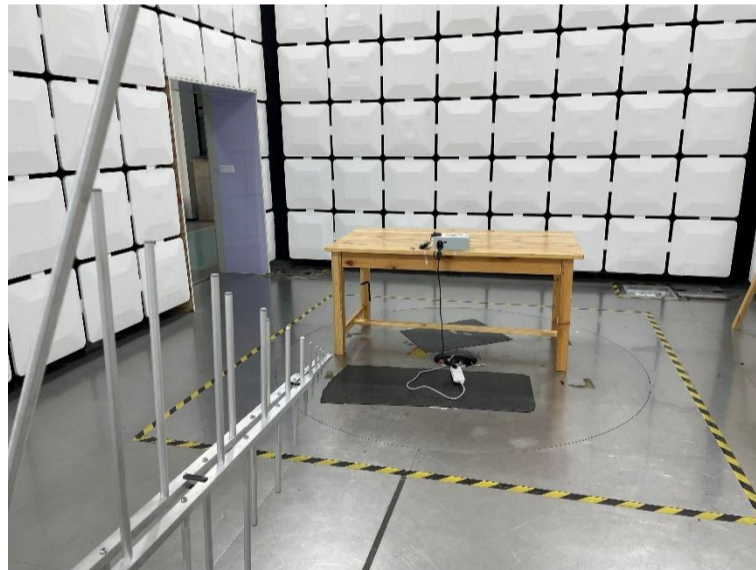
Applicant	: Jiangsu DINGS' Intelligent Control Technology Co., Ltd.	Test Date	: 2025.05.21
EUT	: PM Stepper Linear Actuator	Temperature	: 24.1°C
M/N	: E15PC34-1-12-23.9-001,E,N,K	Humidity	: 50%RH
S/N	: /	Atmospheric Pressure	: 101.8 kPa
Power Supply	: DC 24V	Test Mode	: <u>Running</u>

Test Level (A/m)	Test Duration	Coil Orientation	Criterion	Result
3	120	Axis-X	A	A/PASS
3	120	Axis-Y	A	A/PASS
3	120	Axis-Z	A	A/PASS

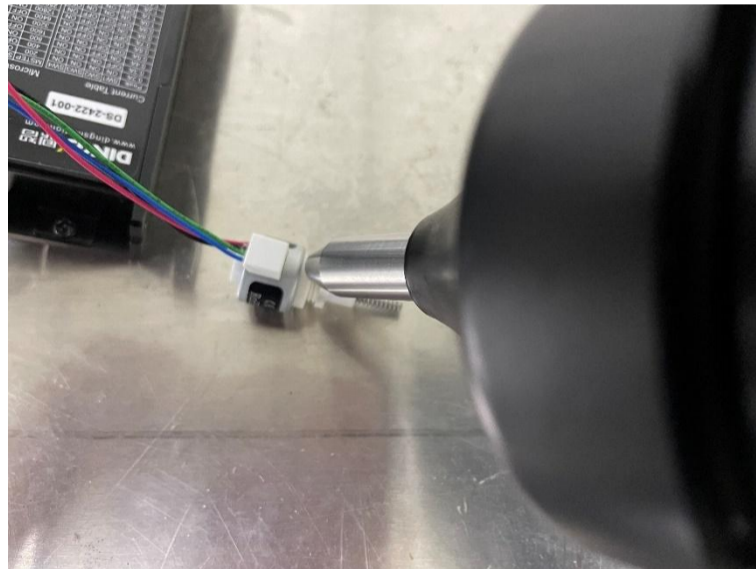
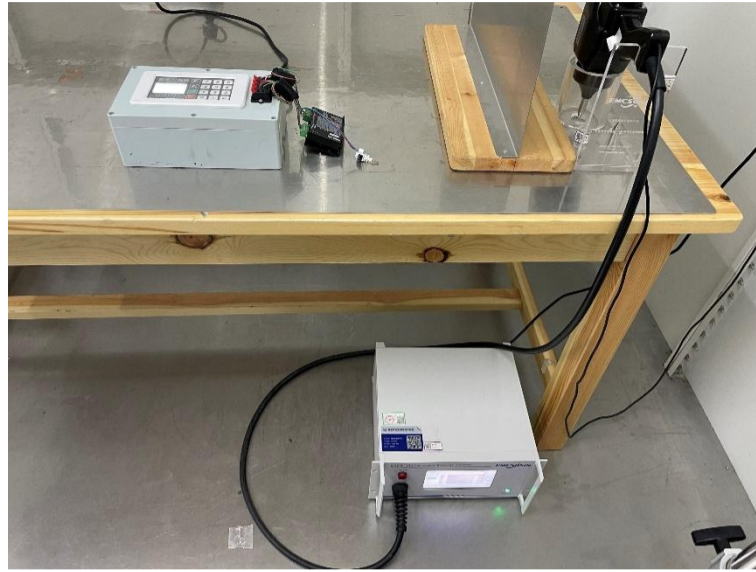
Test result A indicates that there is no abnormality in the work.

12 PHOTOGRAPH

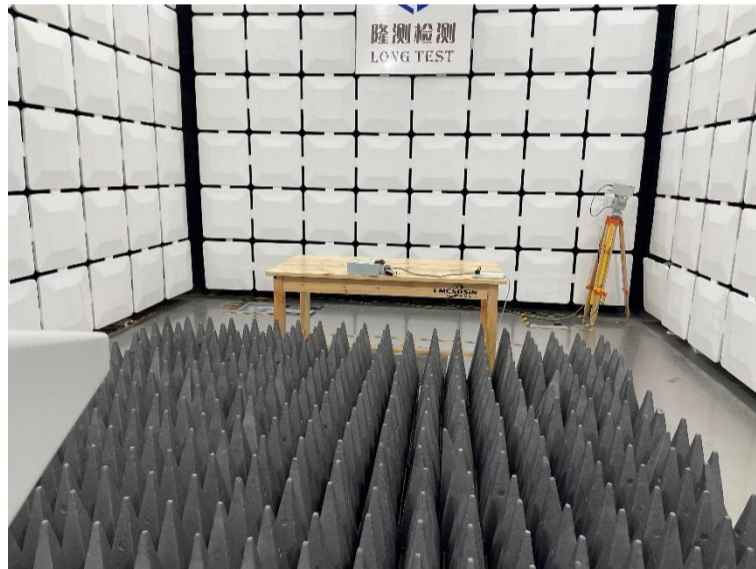
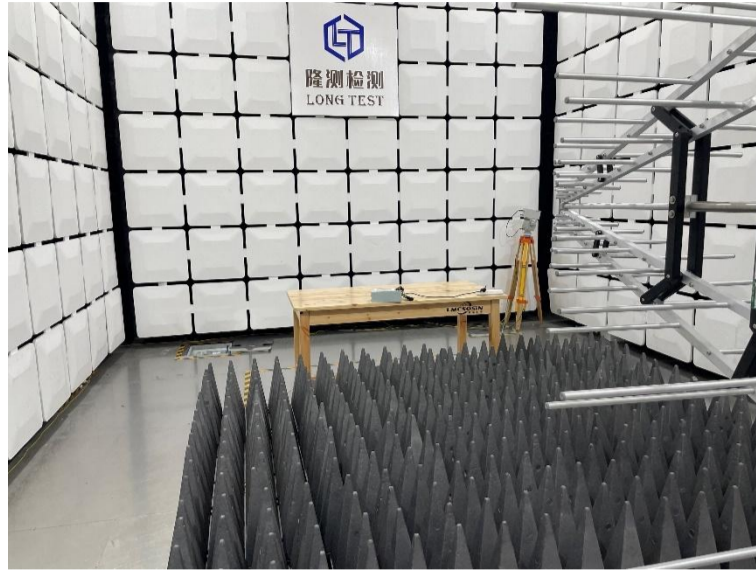
12.1 Radiated Disturbance Test



12.2 Electrostatic Discharge Immunity Test



12.3 Radio frequency electromagnetic fields Test

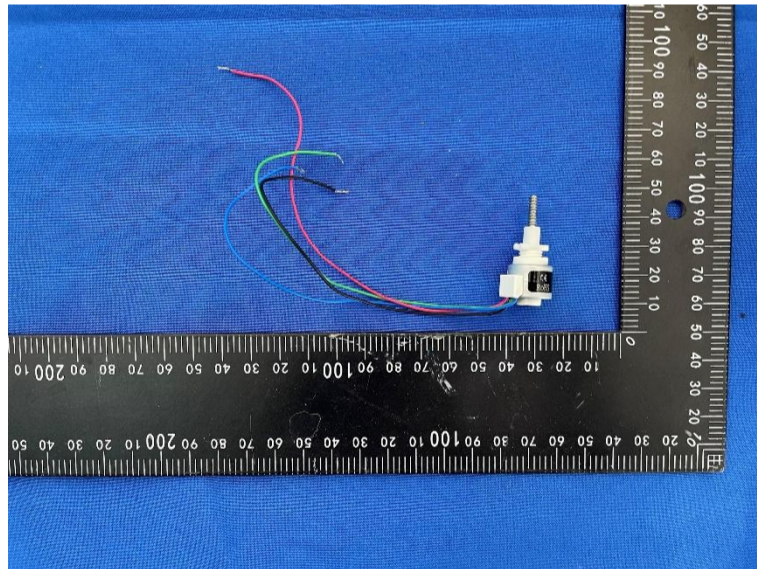
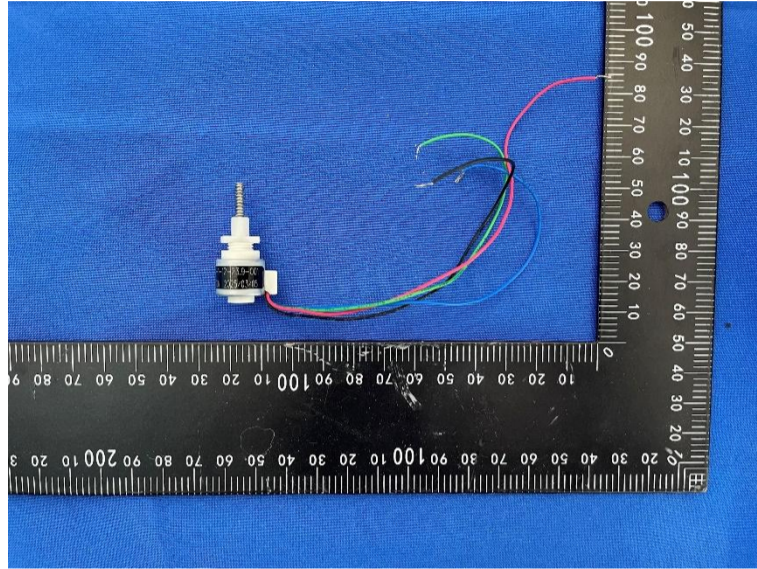


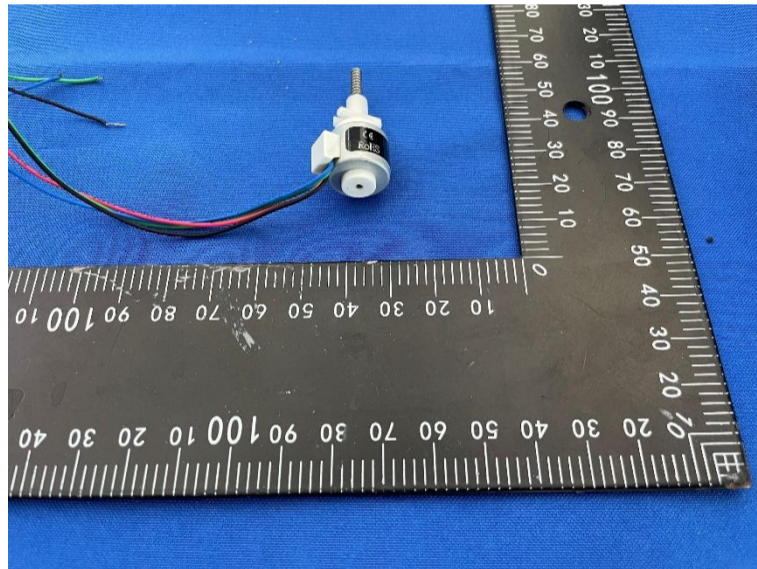
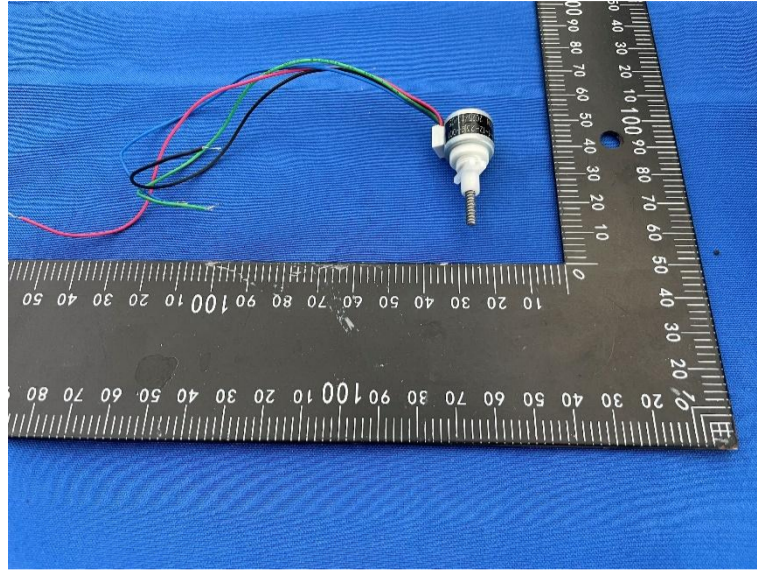
12.4 Power Frequency Magnetic Field Immunity Test



APPENDIX I

PHOTOGRAPHS OF EUT





---- The End ----