EMC TEST REPORT

Electrical equipment for measurement, control and laboratory use

Test Report No. .....:	TCT260109E017	
Date of issue .....:	Jan. 16, 2026	
Testing laboratory.....:	Shenzhen TCT Testing Technology Co., Ltd.	
Testing location/ address.....:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Applicant's name .....:	Suzhou Aotulai Precision Intelligent Manufacturing Co., Ltd.	
Address.....:	No. 269 Xinfeng Road, Xukou Town, Wuzhong District, Suzhou City, Jiangsu Province, China	
Manufacturer's name .....:	Suzhou Aotulai Precision Intelligent Manufacturing Co., Ltd.	
Address.....:	No. 269 Xinfeng Road, Xukou Town, Wuzhong District, Suzhou City, Jiangsu Province, China	
Standard(s) .....:	EN IEC 61326-1:2021 EN IEC 61326-2-2:2021	
Test item description.....:	Automotive Smoke Leak Detector	
Trade Mark.....:	Autoline Pro	
Model/Type reference.....:	S1, S11, S12, S13, S14	
Rating(s) .....:	DC 12 V	
Date of receipt of test item.....:	Jan. 09, 2026	
Date (s) of performance of test:	Jan. 09, 2026 ~ Jan. 16, 2026	
Tested by (+signature).....:	Carol TAN	
Check by (+signature) .....:	Howie LYU	
Approved by (+signature) .....:	Tomsin	

General disclaimer:

This report shall not be reproduced except in full, without the written approval of Shenzhen TCT Testing Technology Co., Ltd. This document may be altered or revised by Shenzhen TCT Testing Technology Co., Ltd. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

Table of Contents

1. General Product Information

1.1. EUT description

Test item description ..... :	Automotive Smoke Leak Detector
Model/Type reference ..... :	S1
Rating(s) ..... :	DC 12 V
DC Line ..... :	☐Shielded ☒Unshielded ☐Detachable ☒Un-detachable ☐No applicable ☒Length: 4.8 m

1.2. Model(s) list

No.	Model No.	Tested with
1	S1	☒
Other models	S11, S12, S13, S14	☐
Note: S1 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of S1 can represent the remaining models.		

2. Test Information

2.1.EUT operation mode(s)

Mode #	Operating mode description	Test voltage
1	Normal	DC 12 V
2	EVAP O-I PSI	DC 12 V

Test worst operating mode	
Radiated emission	Mode 2
Remark: The worst measurement data and graphical presentation show in this report.	

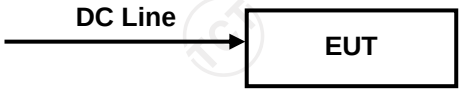
2.2.Special accessories and auxiliary equipment

Product Type	Manufacturer	Model No.	Serial No.
/	/	/	/

Auxiliary cable description

Port name	Specified length(m)	Shielded	Unshielded
/	/	/	/

2.3.Configuration of system under test



(EUT: Automotive Smoke Leak Detector)

2.4.General test conditions

Environmental reference conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.

Measurement uncertainties

Test Item	Uncertainty
Uncertainty for Disturbance voltage at the mains terminals	3.32 dB
Uncertainty for Electromagnetic radiation disturbance (Magnetic Field)	2.90 dB
Uncertainty for Electromagnetic radiation disturbance (Electric Field 30 MHz–1 GHz)	4.86 dB
Uncertainty for Electromagnetic radiation disturbance (Electric Field 1 GHz–18 GHz)	4.91 dB

The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability.

This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the Test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the Basic standards.

All measurement and test results of the EMC laboratory of Shenzhen TCT Testing Technology Co., Ltd. fulfil the requirements for measurement uncertainties according to the standards applied.

Decision rule for statement(s) of conformity is based on simple acceptance specified in Clause 4.3.3 in IEC Guide 115:2023.

3. Test Result Summary

EN IEC 61326-1:2021		
Requirement – Test case		**Verdict**
Classification	☒Group 1 ☐ Group 2	—
	☐Class A ☒ Class B	—
Disturbance voltage		N/A
Electromagnetic radiation disturbance (Magnetic Field)		N/A
Electromagnetic radiation disturbance (Electric Field 30 MHz–1 GHz)		Pass
Electromagnetic radiation disturbance (Electric Field 1 GHz–18 GHz)		N/A
Harmonic current emissions		N/A
Voltage changes, voltage fluctuations and flicker		N/A
Electrostatic discharge immunity (ESD)		Pass
Radiated, radio-frequency, electromagnetic field immunity (RS)		Pass
Electrical fast transient/burst immunity (EFT/B)		Pass
Surge immunity		N/A
Immunity to conducted disturbances, induced by radio-frequency fields (CS)		Pass
Power frequency magnetic field immunity (PFMF)		N/A
Voltage dips, short interruptions and voltage variations immunity (DIPS)		N/A
Remark: ---		

Test case verdicts	
- Test case does not apply to the test object ..... :	N/A
- Test object does meet the requirement ..... :	P (Pass)
- Test object does not meet the requirement ..... :	F (Fail)

4. List of Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESCI3	100898	2026/06/25
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126	8126453	2026/01/20
10db Attenuator	R&S	ESH3-Z2	102720	2026/12/14
844 Shielded room	SKET	8m*4m*4m	CR4	2027/06/26
Test software	EZ_EMC	EMEC-3A1	1.1.4.2	/
Electromagnetic radiation disturbance(Electric Field 30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB 9168	01197	2026/01/23
EMI Test Receiver	R&S	ESCI7	100529	2026/01/20
Pre-amplifier	HP	8447D	2727A05017	2026/06/25
3m Anechoic Chamber	SKET	9m*6m*6m	SA01	2027/06/12
Test software	EZ_EMC	FA-03A2 RE+	1.1.4.2	/
Electromagnetic radiation disturbance(Electric Field 1 GHz to 18 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2026/01/23
Signal Analyzer	R&S	FSQ40	200061	2026/06/25
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	2026/01/20
#3 3m Anechoic Chamber	SKET	9m*6m*6m	SA03	2027/05/29
Test software	EZ_EMC	FA-03A2 RE+	1.1.4.2	/
Electromagnetic radiation disturbance (Magnetic Field)				
Loop antenna	Schwarzbeck	FMZB1519B	00191	2026/06/29
EMI Test Receiver	R&S	ESCI7	100783	2026/01/20
#3 3m Anechoic Chamber	SKET	9m*6m*6m	SA02	2027/02/21
Test software	EZ_EMC	FA-03A2 RE+	1.1.4.2	/
Harmonic current emissions & Voltage Fluctuations and Flicker				
AC Power Supply	KIKUSUI	PCR4000M	UC002552	2026/01/20
Harmonic/Flicker Analyzer	KIKUSUI	KHA1000	UD002324	2026/06/25
Line Impedance Network	KIKUSUI	LIN1020JF	UC001738	2026/06/25
Test software	KIKUSUI	HarmoCapture	V3.9.1.00	/

Electrostatic discharge immunity (ESD)				
Electrostatic Discharge Generator	3ctest	EDS 30T	ES031000122077	2026/06/28
Radiated, radio-frequency, electromagnetic field immunity (RS)				
Antenna	SKET	STLP 9129_Plus	/	/
Signal Generator	Agilent	N5181A	MY50141997	2026/01/20
Amplifier	SKET	HAP_80M01G-250W	202105183	2026/06/25
Amplifier	SKET	HAP_01G06G-80W	202305501	2026/06/25
Field Probe	Narda	EP-601	811ZX01057	2026/06/30
USB Power Sensor	Agilent	U2000A	MY53410013	2026/01/20
USB Power Sensor	Agilent	U2001A	MZ54330012	2026/01/20
743 Anechoic Chamber	SKET	7m*4m*3m	SA04	2028/09/17
Test software	SKET	EMC-S	3.1.3.2	/
Electrical fast transient/burst immunity (EFT/B)				
Fast Transient Burst Simulator	Prima	EFT61004BG	PR12074375	2026/06/25
Capacitive Coupling folder	Prima	EFT-CLAMP	N/A	2026/06/25
Surge immunity				
Lightning Surge Generator	Prima	SUG61005BG	PR12125534	2026/06/25
Immunity to conducted disturbances, induced by radio-frequency fields (CS)				
Conducted Immunity Test System	Schloder	CDG-6000-75	126B1290/2014	2026/06/25
CDN	Schloder	CDN M2+M3-16	A2210281/2014	2026/06/25
CDN	Prima	CRF-CDN-TRJ45	PR230681112	2026/06/25
EM-Clamp	Schloder	EMCL-20	132A1194/2014	2026/06/25
RF Attenuator	PE	75W 6dB	N/A	2026/06/25
Test software	HUBERT	IEC/EN61000-4-6	V 1.5	/
Power frequency magnetic field immunity (PFMF)				
Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8K	G121941CS1341114	2026/06/25
Adjsutable Magnetic Field Coil	EVERFINE	MFC-4	G1242BBS1341114	2026/06/25
Voltage dips, short interruptions and voltage variations immunity (DIPS)				
Cycle Sag Simulator	Prima	DRP61011AG	PR12106201	2026/06/25

5. Test Conditions and Results (Emission)

5.1. Disturbance voltage

Test requirement.....:	EN IEC 61326-1:2021	
Reference standard .....:	EN 55011:2016+A1:2017+A11:2020+A2:2021	
Test frequency range.....:	150 kHz to 30 MHz	
Limits.....:	☐	Table 2 (for class A group 1 equipment measured on a test site, a.c. mains power port)
	☐	Table 2 relaxed by 20 dB for quasi-peak limits (for class A X-ray generator operating in intermittent mode)
	☐	Table 3 (for class A group 1 equipment measured on a test site, d.c. power port)
	☐	Table 4 (for class B group 1 equipment measured on a test site, a.c. mains power port)
	☐	Table 4 relaxed by 20 dB for quasi-peak limits (for class B X-ray generator operating in intermittent mode)
	☐	Table 5 (for class B group 1 equipment measured on a test site, d.c. power port)
	☐	Table 8 (for class A group 2 equipment measured on a test site, a.c. mains power port)
	☐	Table 9 (for class B group 2 equipment measured on a test site, a.c. mains power port)
Test method.....:	The AMN placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.	
Ambient temperature.....:	/	
Relative humidity.....:	/	
Test location.....:	/	
Test model(s) .....:	/	
EUT operation mode.....:	/	
Test results.....:	N/A	
Remark.....:	According to the electrical construction of the EUT, there is no AC terminal incorporated. Therefore this test is not applicable for this EUT.	

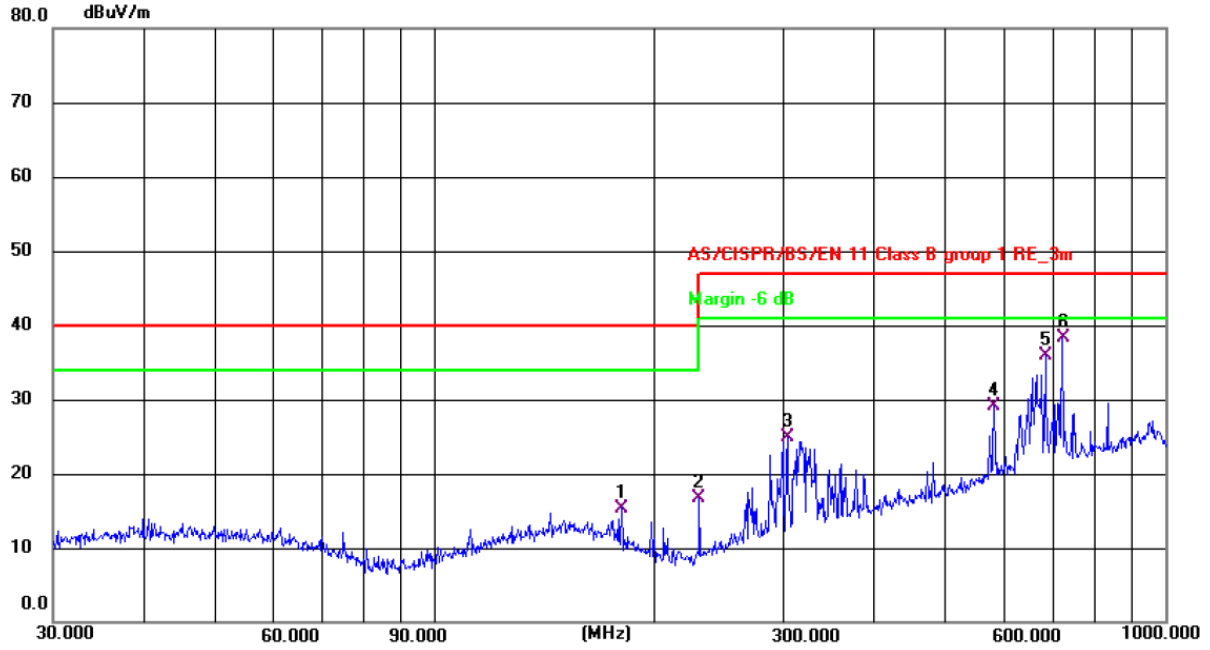
5.2. Electromagnetic radiation disturbance (magnetic field)

Test requirement.....:	EN IEC 61326-1:2021	
Reference standard .....:	EN 55011:2016+A1:2017+A11:2020+A2:2021	
Test frequency range.....:	150 kHz to 30 MHz	
Limits.....:	☐	Table 10, Magnetic field limits (for class A group 2 equipment measured on a test site)
	☐	Table 12, Magnetic field limits (for class B group 2 equipment measured on a test site)
Test method.....:	Measurements were made in a 3/10-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3/10 meters with the receive antenna located at 1 meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Ambient temperature.....:	/	
Relative humidity .....:	/	
Test location .....:	/	
Test model(s) .....:	/	
EUT operation mode.....:	/	
Test results .....:	N/A	
Remark.....:	This test isn't applicable because the EUT doesn't have relative function.	

5.3. Electromagnetic radiation disturbance (Electric Field 30 MHz–1 GHz)

Test requirement.....:	EN IEC 61326-1:2021	
Reference standard	EN 55011:2016+A1:2017+A11:2020+A2:2021	
Test frequency range.:	30 MHz to 1 GHz	
Limits.....:	☐	Table 6 (for class A group 1 equipment measured on a test site)
	☒	Table 7 (for class B group 1 equipment measured on a test site)
	☐	Table 10 (for class A group 2 equipment measured on a test site)
	☐	Table 11 (for class A EDM and arc welding equipment measured on a test site)
	☐	Table 12 (for class B group 2 equipment measured on a test site)
	☐	Table 16 (for class A group 1 equipment measured in situ)
	☐	Table 17 (for class A group 2 equipment measured in situ)
	☐	Table 6 (for class A group 1 equipment measured on a test site)
Test method.....:	Measurements were made in a 3/10-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3/10 meters with the receive antenna located at 1 to 4-meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Ambient temperature.:	23.7 °C	
Relative humidity.....:	52 %	
Test location.....:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Test model(s) .....:	S1	
EUT operation mode..:	Mode 2	
Test results .....:	Pass	
Remark.....:	The EUT highest internal frequency less 108 MHz, So don't need to test above 1 GHz.	

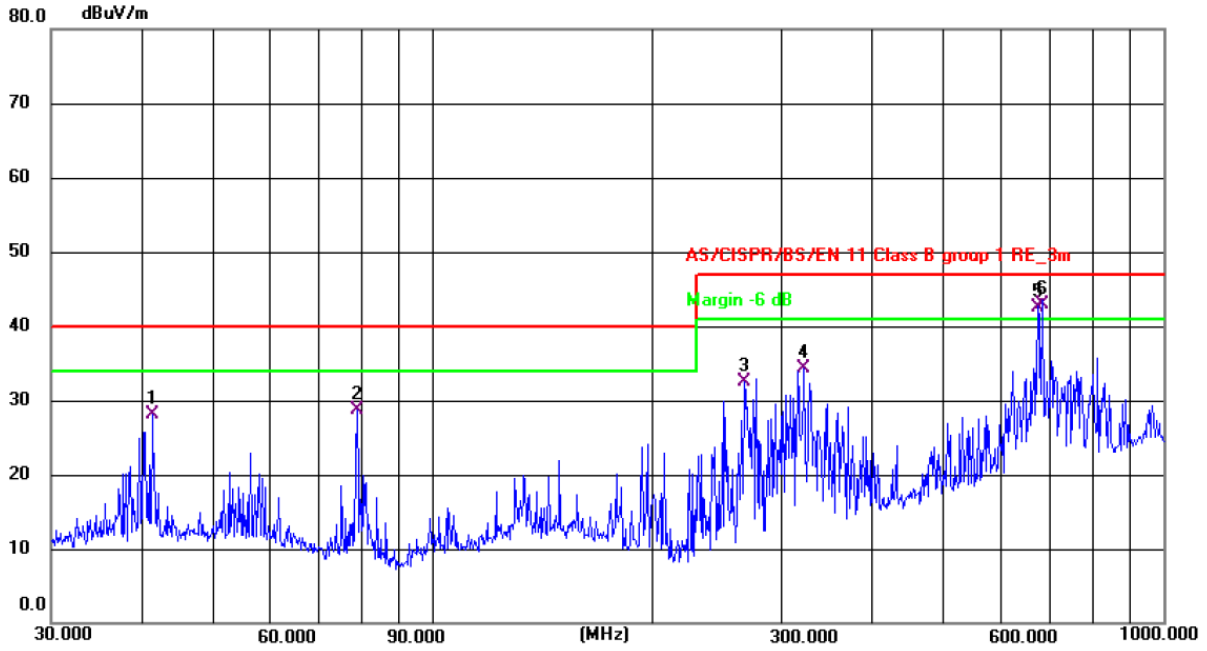
Measurement data and Graphical presentation of the result



Site: 3m Anechoic Chamber1 Polarization: *Horizontal* Temperature: 23.7(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 11 Class B group 1 RE_3m Power: DC 12 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	180.0164	28.89	-13.49	15.40	40.00	-24.60	QP	P	
2	230.5021	31.09	-14.43	16.66	47.00	-30.34	QP	P	
3	303.9431	35.55	-10.71	24.84	47.00	-22.16	QP	P	
4	583.7649	34.54	-5.40	29.14	47.00	-17.86	QP	P	
5	686.8495	39.89	-3.95	35.94	47.00	-11.06	QP	P	
6 *	722.3587	41.86	-3.47	38.39	47.00	-8.61	QP	P	



Site: 3m Anechoic Chamber1 Polarization: *Vertical* Temperature: 23.7(C) Humidity: 52 %

Limit: AS/CISPR/BS/EN 11 Class B group 1 RE_3m Power: DC 12 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	41.2946	40.09	-12.07	28.02	40.00	-11.98	QP	P	
2	78.7578	44.58	-15.97	28.61	40.00	-11.39	QP	P	
3	267.0767	45.01	-12.44	32.57	47.00	-14.43	QP	P	
4	322.6125	44.65	-10.28	34.37	47.00	-12.63	QP	P	
5 !	673.4343	46.40	-3.80	42.60	47.00	-4.40	QP	P	
6 *	683.8454	47.00	-4.00	43.00	47.00	-4.00	QP	P	

5.4. Electromagnetic radiation disturbance (Electric field 1 GHz–18 GHz)

Test requirement.....:	EN IEC 61326-1:2021	
Reference standard .....:	EN 55011:2016+A1:2017+A11:2020+A2:2021	
Test frequency range.....:	1 GHz to 18 GHz	
Limits.....:	☐	Table 13 (for group 2 equipment operating at frequencies above 400 MHz)
	☐	Table 14 (for electromagnetic radiation disturbance weighted limits for group 2 equipment operating at frequencies above 400 MHz)
	☐	Table 15 (for electromagnetic radiation disturbance APD level corresponding to 10–1 limits for class B group 2 equipment operating at frequencies above 400 MHz)
Test method.....:	Measurements were made in a 3/10-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3/10 meters with the receive antenna located at 1 meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Ambient temperature.....:	/	
Relative humidity.....:	/	
Test location.....:	/	
Test model(s) .....:	/	
EUT operation mode.....:	/	
Test results.....:	N/A	
Remark.....:	According to Clause 5, "Classification of equipment," of EN 55011:2016+A1:2017+A11:2020+A2:2021, this product is classified as Group 1 and Class B equipment. As per Subclause 6.2.2.4 ("In the frequency range 1 GHz to 18 GHz, limits are not specified.") of the same standard, this test is not applicable.	

5.5.Harmonic current emissions

Test requirement ..... :	EN IEC 61326-1:2021	
Reference standard .....:	EN IEC 61000-3-2:2019+A1:2021	
Limit classification in accordance with the standard ..... :	**Limits - Class A equipment**	
	Odd harmonics	
	Harmonic order (n)	**Maximum permissible harmonic current (A)**
	3	2.30
	5	1.14
	7	0.77
	9	0.40
	11	0.33
	13	0.21
	15 ≤ n ≤ 39	0.15 x 15/n
	Even harmonics	
	2	1.08
	4	0.43
	6	0.30
	8 ≤ n ≤ 40	0.23 x 8/n
Test method ..... :	This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.	
Ambient temperature..... :	/	
Relative humidity ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode..... :	/	
Test results ..... :	N/A	
Remark..... :	According to the electrical construction of the EUT, there is no AC terminal incorporated. Therefore this test is not applicable for this EUT.	

5.6. Voltage changes, voltage fluctuations and flicker

Test requirement ..... :	EN IEC 61326-1:2021
Reference standard .....:	EN 61000-3-3:2013+A1:2019+A2:2021
Applied limit ..... :	The value of P_{st} shall be not greater than 1.0 The value of P_{lt} shall be not greater than 0.65 The value of d(t) during a voltage change shall not exceed 3.3 % for more than 500 ms The relative steady-state voltage change, dc shall not exceed 3.3 % The maximum relative voltage change d_{max} shall not exceed: a) 4 % without additional conditions b) 6 % for equipment which is: - switched manually, or - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption c) 7 % for equipment which is - attended whilst in use (for example : hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as mowers, portable tools such as electric drills), or - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.
Test method..... :	This test consists on the measurement of voltage changes, voltage fluctuations and flicker which may be produced by equipment having an input current ≤ 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.
Observation time ..... :	10 Minutes
	120 Minutes
	24 times switching according to Annex B
Ambient temperature..... :	/
Relative humidity ..... :	/
Test location ..... :	/
Test model(s) ..... :	/
EUT operation mode..... :	/
Test results ..... :	N/A
Remark..... :	According to the electrical construction of the EUT, there is no AC terminal incorporated. Therefore this test is not applicable for this EUT.

6. Test Conditions and Results (Immunity)

6.1.General information

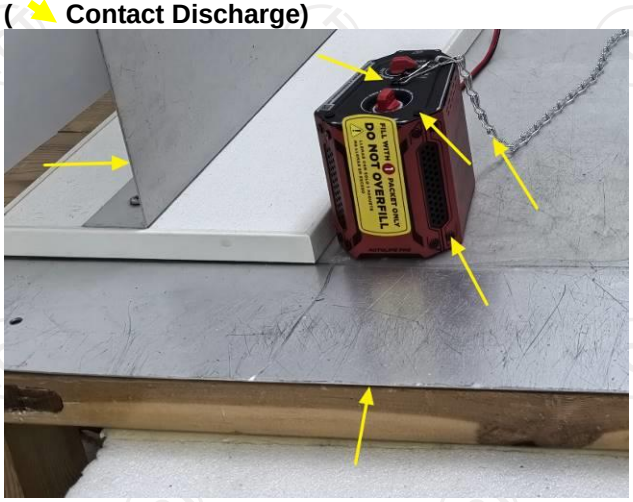
Performance criteria as defined by the standard	
Criterion	**Description from standard**
A	The equipment shall continue to operate as intended during and after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. In the case of applying immunity tests with continuous electromagnetic phenomena, the PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE which shall recover, without user intervention. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. No change in the operating state is allowed nor is loss of data.
B	The equipment shall continue to operate as intended after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. During the test, the equipment PERFORMANCE LEVEL may be replaced by a permissible LOSS OF PERFORMANCE if such LOSS OF PERFORMANCE is detailed in the EMC test plan. A permissible LOSS OF PERFORMANCE is allowed within the PERFORMANCE LEVEL only when this information is clearly provided to the end user via documentation, such as the product user manual. An unintended change of the operating state is allowed if self-recoverable. No loss of stored data is allowed. The following are examples of performance criterion B: • Data transfer is controlled or checked by parity check or by other means. In the case of malfunction, such as caused by a surge impulse, the data transfer will be repeated automatically. A reduced data transfer rate at this time is allowable degradation. • During testing, an analogue function value may deviate in excess of the specified limits. After the test, the deviation vanishes. • In the case of a monitor used only for man-machine monitoring, it is allowable that some degradation takes place, such as momentary display interference during the application of burst impulses.
C	LOSS OF FUNCTION is allowed, provided the function is self-recoverable or can be restored by the operation of the controls. Recovery procedure shall be included in the user documentation. No permanent damage to the equipment is allowed. The following are examples of performance criterion C: • In the case of an interruption in the mains longer than the specified buffer time, the power supply unit of the equipment is switched off. The switch-on may be automatic or carried out by the operator. • After a programme interruption caused by a disturbance, the processor functions of the equipment stops at a defined position and is not left in a "crashed state". An operator's action may be necessary • The test results in an opening of an over-current protection equipment that can be reset by the operator.

6.2. Electrostatic discharge immunity

Test requirement ..... :	EN IEC 61326-1:2021	
Basic standard ..... :	EN 61000-4-2:2009	
Test level ..... :	**Discharge type**	**Discharge voltage**
	Contact discharge voltage	±4 kV
	Air discharge voltage	±8 kV
Storage capacitor ..... :	150 pF	
Discharge resistor ..... :	330 Ω	
Horizontal coupling plate ..... :	1.6 x 0.8 m	
Vertical coupling plate ..... :	0.5 x 0.5 m	
Number of discharges ..... :	Min. 10 per discharge location	
Discharge interval ..... :	1 second	
Performance criteria ..... :	B	
Test method ..... :	The table-top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.	
Ambient temperature ..... :	24.4 °C	
Relative humidity ..... :	52 %	
Air pressure ..... :	100.5 kPa	
Test location ..... :	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Test model(s) ..... :	S1	
EUT operation mode ..... :	Mode 1, Mode 2	
Test results ..... :	Pass	
Remark ..... :	/	

6.2.1. Test results for electrostatic discharges

Photos of selected test points:
(Air Discharge)
(Contact Discharge)



Contact discharges			
Test point	Positive polarity	Negative polarity	Observations
	4 kV	4 kV	
VCP- Four Sides	Pass	Pass	☒1 ☐2 ☐3
HCP- Four Sides	Pass	Pass	☒1 ☐2 ☐3
Points on conductive surface as indicated in the picture above	Pass	Pass	☒1 ☐2 ☐3

Air discharges			
Test point	Positive polarity	Negative polarity	Observations
	8 kV	8 kV	
Points on non-conductive surface as indicated in the picture above	/	/	/

6.2.2. Test results of observations description

/ - Not performed or not required.
1 –No obvious change of function was found after the test.
2 –The function stopped during the test, but can be recoverable by itself operation after the test.
3 –The function stopped during the test, but can be recoverable manually after the test.

6.3. Radiated, radio-frequency, electromagnetic field immunity

Test requirement ..... :	EN IEC 61326-1:2021		
Basic standard ..... :	EN IEC 61000-4-3:2020		
Test level ..... :	**Test Levels for basic electromagnetic environment**		
	Frequency (MHz)	**Field strength**	**Modulation**
	80 - 1000	3 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
	1400 - 6000	3 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
	Test Levels for industrial electromagnetic environment		
	80 - 1000	10 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
	1400 - 6000	3 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
	Test Levels for controlled electromagnetic environment		
	80 - 1000	1 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
	1400 - 6000	1 V/m (r.m.s.) (unmodulated)	80% AM (1 kHz)
Dwell time ..... :	1 second		
Step size ..... :	1 %		
Distance antenna to EUT..... :	3 m		
Performance criteria..... :	A		
Test method..... :	Measurements were made in a fully anechoic chamber and the indicated field strength was pre-calibrated prior to placement of the system under test. Tests were performed in both the horizontal and vertical polarities, where applicable. The antenna was placed 3 meters from the product under test. All sides of the EUT were investigated for anomalies.		
Ambient temperature..... :	23.9 °C		
Relative humidity ..... :	48 %		
Air pressure..... :	100.5 kPa		
Test location ..... :	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China		
Test model(s) ..... :	S1		
EUT operation mode..... :	Mode 1, Mode 2		
Test results ..... :	Pass		
Remark..... :	/		

6.3.1. Test results for radio-frequency electromagnetic field

Frequency(MHz)	EUT side	Antenna polarity	Field strength(V/m)	Observation	Results
80 MHz to 1 GHz	Front	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Left Side	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Right Side	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Rear	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Front	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Left Side	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Right Side	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Rear	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
1.4 GHz to 6 GHz	Front	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Left Side	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Right Side	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Rear	Horizontal	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Front	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Left Side	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Right Side	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass
	Rear	Vertical	☐1 ☒3 ☐10	☒1 ☐2 ☐3	Pass

6.3.2. Test results of observations description

/ - Not performed or not required.
1 –No obvious change of function was found after the test.
2 –The function stopped during the test, but can be recoverable by itself operation after the test.
3 –The function stopped during the test, but can be recoverable manually after the test.

6.4.Electrical fast transient/burst immunity

Test requirement ..... :	EN IEC 61326-1:2021	
Basic standard ..... :	EN 61000-4-4:2012	
Test level ..... :	**Test Levels for basic electromagnetic environment**	
	Measurement port	**Voltage**
	Input a.c. power ports	±1 kV
	Input d.c. power ports	±1 kV
	Signal/control ports	±0.5 kV (including functional earth) ±1 kV (connected directly to mains supply)
	Test Levels for industrial electromagnetic environment	
	Input a.c. power ports	±2 kV
	Input d.c. power ports	±2 kV
	Signal/control ports	±1 kV (including functional earth) ±2 kV (connected directly to mains supply)
	Test Levels for controlled electromagnetic environment	
	Input a.c. power ports	±1 kV
	Input d.c. power ports	±1 kV
	Signal/control ports	±0.5 kV
Burst duration ..... :	15 ms	
Burst period..... :	300 ms	
Repetition frequency ..... :	5 kHz or 100 kHz	
Test time ..... :	2 minutes per level & polarity	
Performance criteria..... :	B	
Test method..... :	Measurements were made on a ground plane that extends 0.5-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). One of each unique interface was tested for a period of 2 minute per polarity. The bursts are applied on the mains supply port by using a coupling decoupling network and on signal and control lines ports by using a capacitive clamp.	
Ambient temperature..... :	24.1 °C	
Relative humidity ..... :	49 %	
Air pressure..... :	100.5 kPa	
Test location ..... :	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Test model(s) ..... :	S1	
EUT operation mode..... :	Mode 1, Mode 2	
Test results ..... :	Pass	
Remark..... :	/	

6.4.1. Test results for electrical fast transient/burst

Measurement port	Level	Polarity	Observation	Results
DC power port	☐0.5 kV ☒1 kV ☐2 kV	Positive & Negative	☐1 ☒2 ☐3	Pass

6.4.2. Test results of observations description

/ - Not performed or not required.
1 –No obvious change of function was found after the test.
2 –The function stopped during the test, but can be recoverable by itself operation after the test.
3 –The function stopped during the test, but can be recoverable manually after the test.

6.5.Surge immunity

Test requirement ..... :	EN IEC 61326-1:2021		
Basic standard ..... :	EN 61000-4-5:2014+A1:2017		
Test level ..... :	**Test Levels for basic electromagnetic environment**		
	Measurement port	**Coupling point**	**Open-circuit peak voltage**
	Input A.C./D.C. Power Ports	Line to Line	±0.5 kV
		Line to Earth	±1 kV
	Signal/control Ports	Line to Line	±0.5 kV
		Line to Earth	±1 kV
	Test Levels for industrial electromagnetic environment		
	Input A.C./D.C. Power Ports	Line to Line	±1 kV
		Line to Earth	±2 kV
	Signal/control Ports	Line to Line	±1 kV
		Line to Earth	±2 kV
	Test Levels for controlled electromagnetic environment		
	Input A.C. Power Ports	Line to Line	±0.5 kV
		Line to Earth	±1 kV
Repetition rate ..... :	1/min		
Phase angles ..... :	Positive pulses and negative pulses are applied 0°, 90°, 180° and 270°		
Number of pulses for each coupling ..... :	5		
Performance criteria ..... :	B		
Test method ..... :	Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Five (5) positive surges and five (5) negative surges were applied at each of phases of the A.C. waveform: 0°, 90°, 180° and 270°. Each surge was applied 60 seconds after the previous surge. Signal and Telecommunications ports were subject to five (5) positive and five (negative) surges applied through the appropriate Coupling/Decoupling Network (CDN).		
Ambient temperature ..... :	/		
Relative humidity ..... :	/		
Air pressure ..... :	/		
Test location ..... :	/		
Test model(s) ..... :	/		
EUT operation mode ..... :	/		
Test results ..... :	N/A		
Remark ..... :	According to the electrical construction of the EUT, there is no AC terminal incorporated. Therefore this test is not applicable for this EUT.		

6.6. Immunity to conducted disturbances, induced by radio-frequency fields

Test requirement ..... :	EN IEC 61326-1:2021		
Basic standard ..... :	EN IEC 61000-4-6:2023		
Frequency range ..... :	150 kHz to 80 MHz		
Test level ..... :	**Test Levels for basic electromagnetic environment**		
	Measurement Point	**Test value**	**Amplitude modulation**
	Input a.c. power ports	3 V	80% AM (1 kHz)
	Input d.c. power ports	3 V	80% AM (1 kHz)
	Signal/control ports	3 V	80% AM (1 kHz)
	Test Levels for industrial electromagnetic environment		
	Input a.c. power ports	3 V	80% AM (1 kHz)
	Input d.c. power ports	3 V	80% AM (1 kHz)
	Signal/control ports	3 V	80% AM (1 kHz)
	Test Levels for controlled electromagnetic environment		
	Input a.c. power ports	1 V	80% AM (1 kHz)
	Input d.c. power ports	1 V	80% AM (1 kHz)
	Signal/control ports	1 V	80% AM (1 kHz)
Dwell time ..... :	1 second		
Step size ..... :	1 %		
Performance criteria ..... :	A		
Test method ..... :	The test allows estimating of the conducted immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 150 kHz to 80 MHz. The interference is applied on mains supply, signal line and earth connection ports by using coupling decoupling networks or a clamp.		
Ambient temperature ..... :	23.6 °C		
Relative humidity ..... :	45 %		
Air pressure ..... :	100.5 kPa		
Test location ..... :	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China		
Test model(s) ..... :	S1		
EUT operation mode ..... :	Mode 1, Mode 2		
Test results ..... :	Pass		
Remark ..... :	/		

6.6.1. Test results for Immunity to injected currents

Measurement port	Frequency	Coupling type	Level	Observation	Results
DC power port	0.15 MHz to 80 MHz	CDN	☐1 V ☒3 V	☒1 ☐2 ☐3	Pass

6.6.2. Test results of observations description

/ - Not performed or not required.
1 –No obvious change of function was found after the test.
2 –The function stopped during the test, but can be recoverable by itself operation after the test.
3 –The function stopped during the test, but can be recoverable manually after the test.

6.7.Power frequency magnetic field immunity (PFMF)

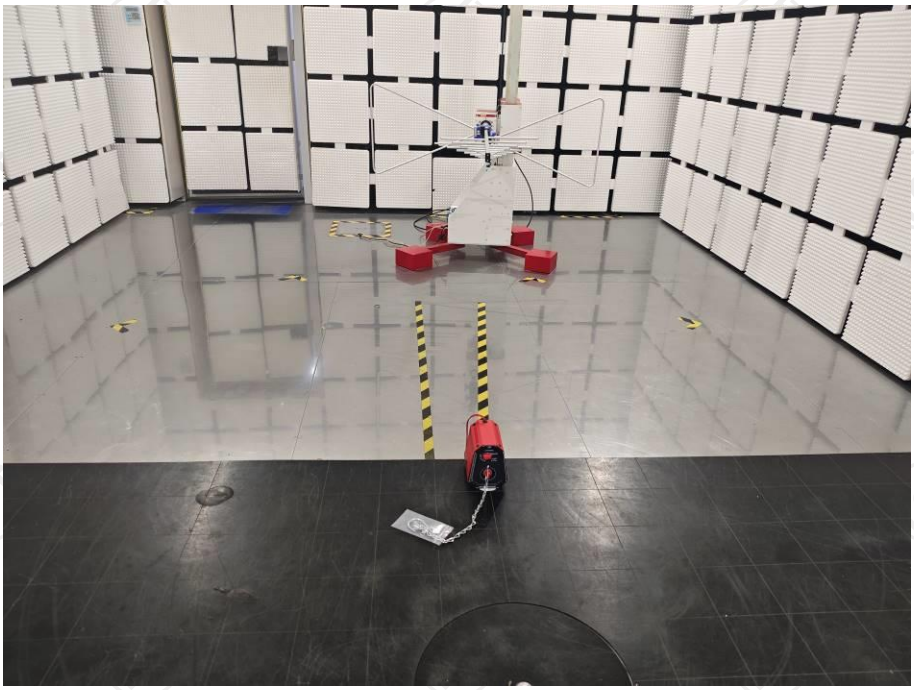
Test requirement ..... :	EN IEC 61326-1:2021	
Basic standard ..... :	EN 61000-4-8:2010	
Test level ..... :	**Test Levels for basic electromagnetic environment**	
	Frequency	**A/m**
	50/60 Hz	3
	Test Levels for industrial electromagnetic environment	
	Frequency	**A/m**
	50/60 Hz	30
Performance criteria ..... :	A	
Test method ..... :	Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. The EUT was located 80cm above the reference ground plane and the indicated field was pre-calibrated prior to placement of the system under test.	
Ambient temperature ..... :	/	
Relative humidity ..... :	/	
Air pressure ..... :	/	
Test location ..... :	/	
Test model(s) ..... :	/	
EUT operation mode ..... :	/	
Test results ..... :	N/A	
Remark ..... :	The EUT does not contain components susceptible to magnetic fields, therefore this test is not applicable for this EUT.	

6.8. Voltage dips, short interruptions and voltage variations immunity

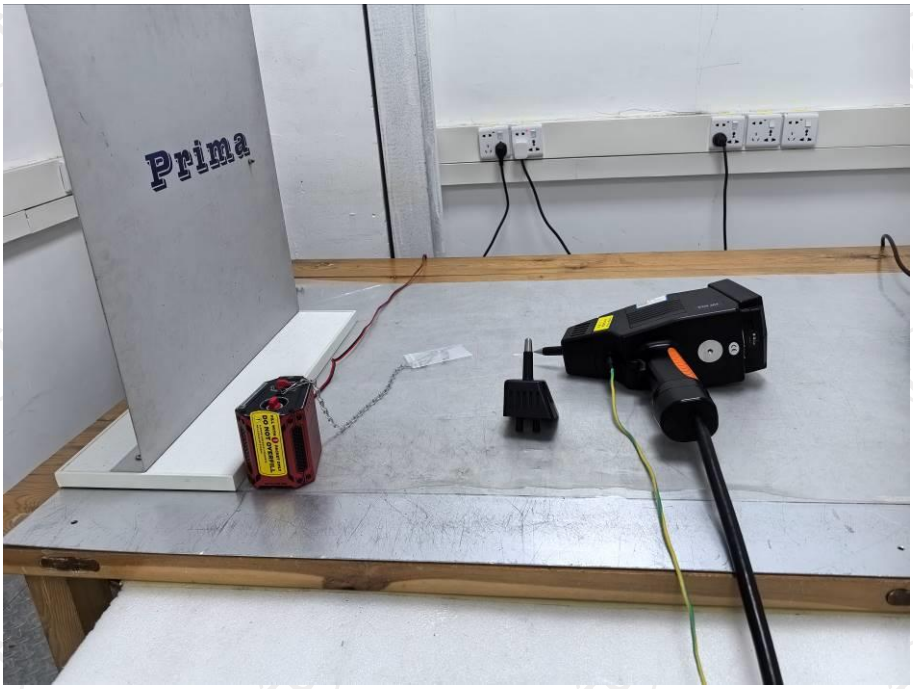
Test requirement ..... :	EN IEC 61326-1:2021		
Basic standard ..... :	EN IEC 61000-4-11:2020		
Test level ..... :	**Test Levels for basic electromagnetic environment**		
	Voltage Dips		
	Frequency	**Test level in % U_T**	**Duration**
	50 Hz	0	0.5 cycle
	50 Hz	0	1 cycle
	50/60 Hz	70	25/30 cycles
	Voltage interruptions		
	50/60 Hz	0	250/300 cycles
	Test Levels for industrial electromagnetic environment		
	Voltage Dips		
	50 Hz	0	1 cycle
	50/60 Hz	40	10/12 cycles
	50/60 Hz	70	25/30 cycles
	Voltage interruptions		
	50/60 Hz	0	250/300 cycles
	U_T is the rated voltage of the equipment under test.		
Repetition rate ..... :	10 seconds		
Number of dips or interruptions ..... :	3		
Performance criteria ..... :	B & C		
Test method ..... :	The test allows estimating of the conducted immunity of electrical and electronic equipment connected to low-voltage power supply networks for voltage dips and short interruptions. The interference is applied on mains supply port by using a testing generator.		
Ambient temperature ..... :	/		
Relative humidity ..... :	/		
Air pressure ..... :	/		
Test location ..... :	/		
Test model(s) ..... :	/		
EUT operation mode ..... :	/		
Test results ..... :	N/A		
Remark ..... :	According to the electrical construction of the EUT, there is no AC terminal incorporated. Therefore this test is not applicable for this EUT.		

7. Test set-up photo

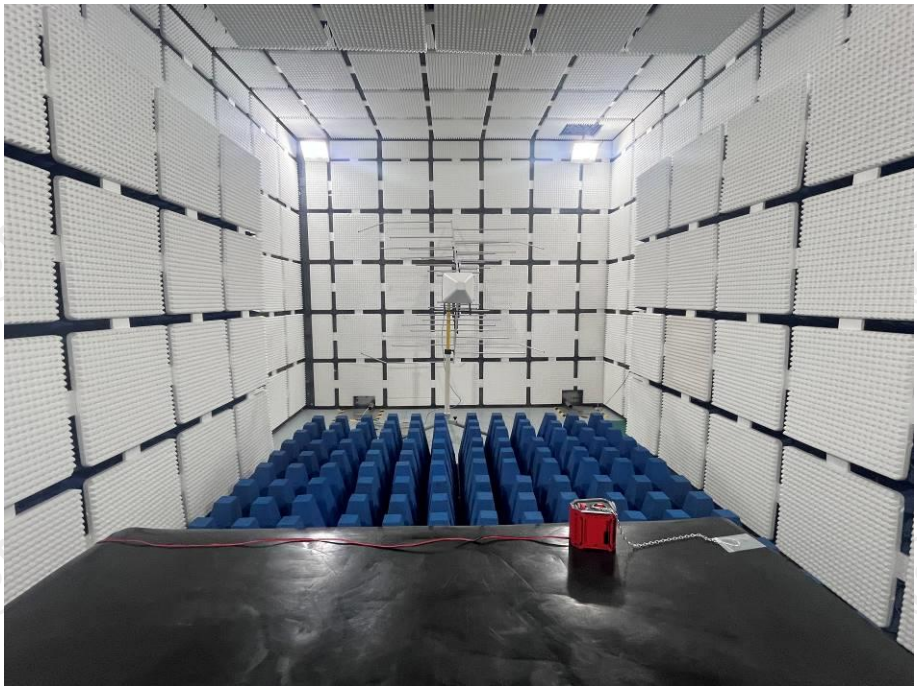
Electromagnetic radiation disturbance (Electric Field 30 MHz–1 GHz) test view



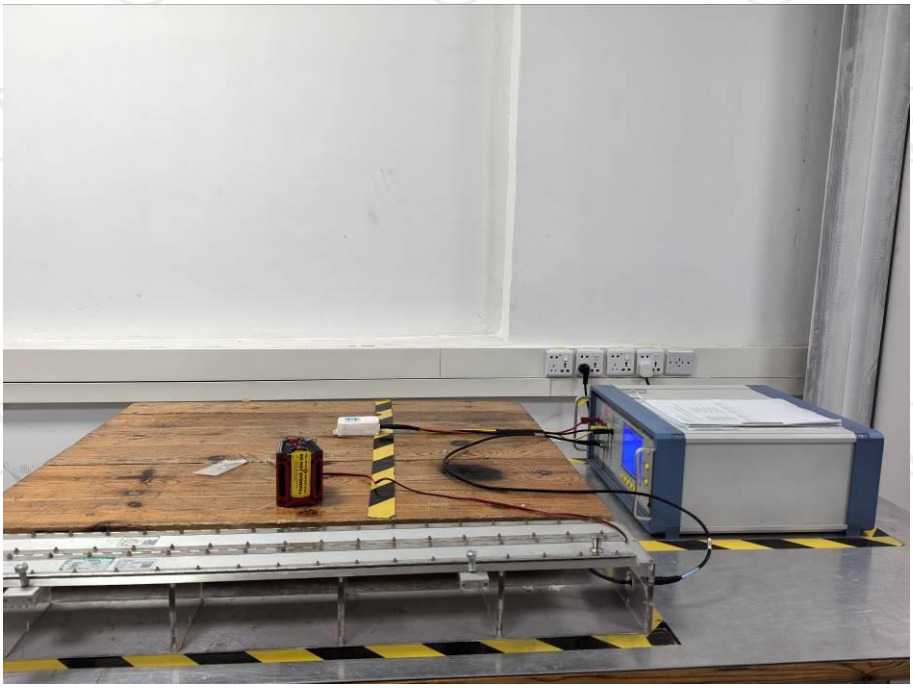
Electrostatic discharge immunity (ESD) test view



Radiated, radio-frequency, electromagnetic field immunity (RS) test view



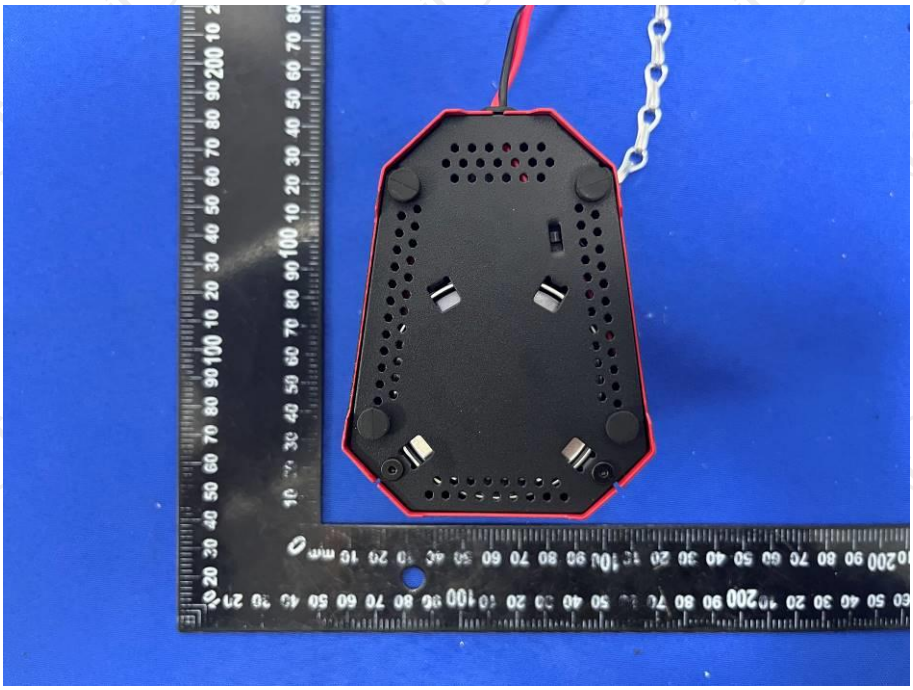
Electrical fast transient/burst immunity (EFT/B) test view

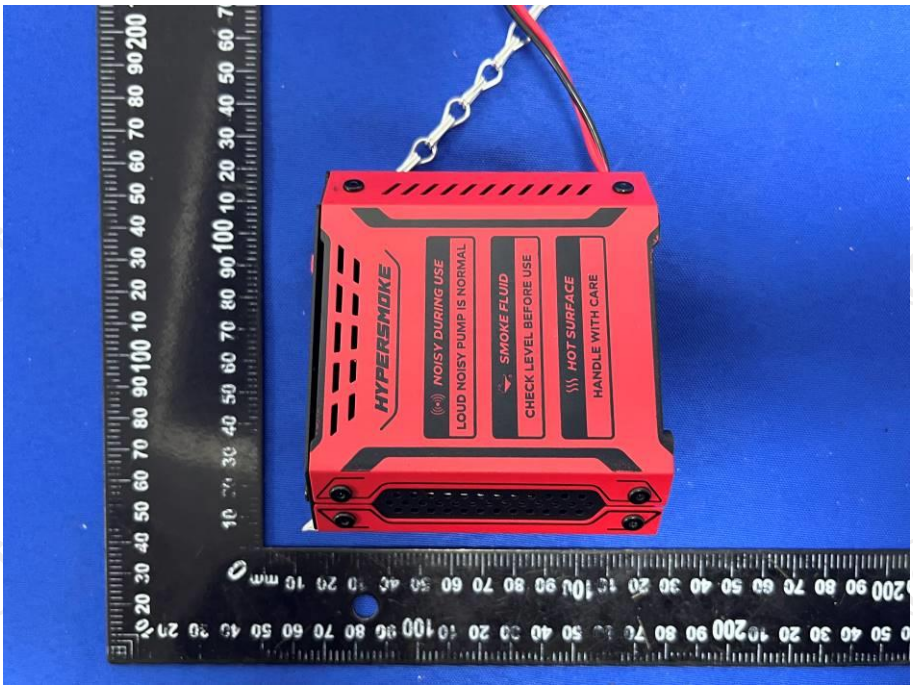


Immunity to conducted disturbances, induced by radio-frequency fields (CS) test view

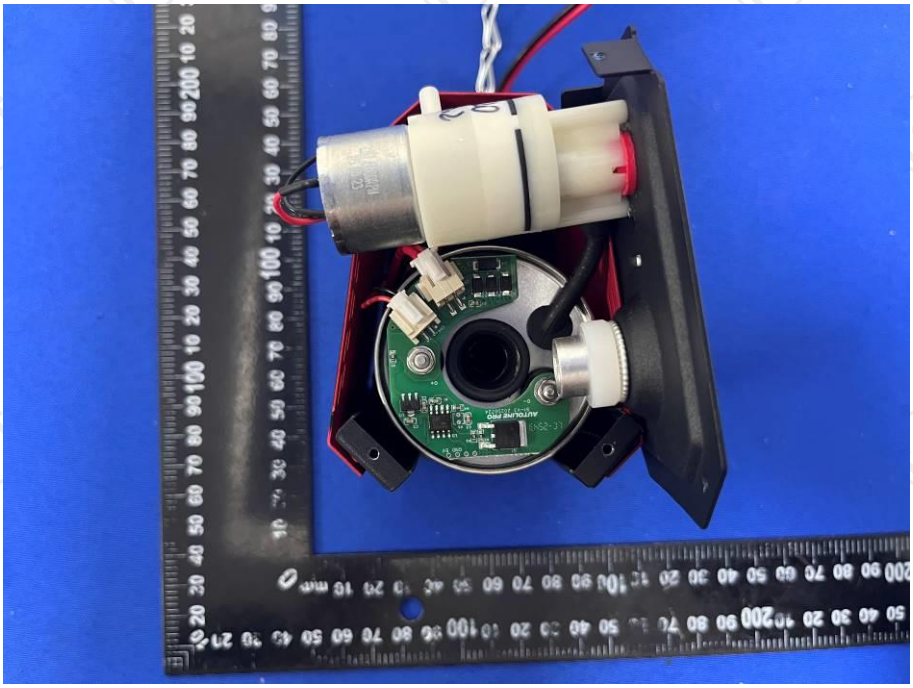
8. Photo of the EUT

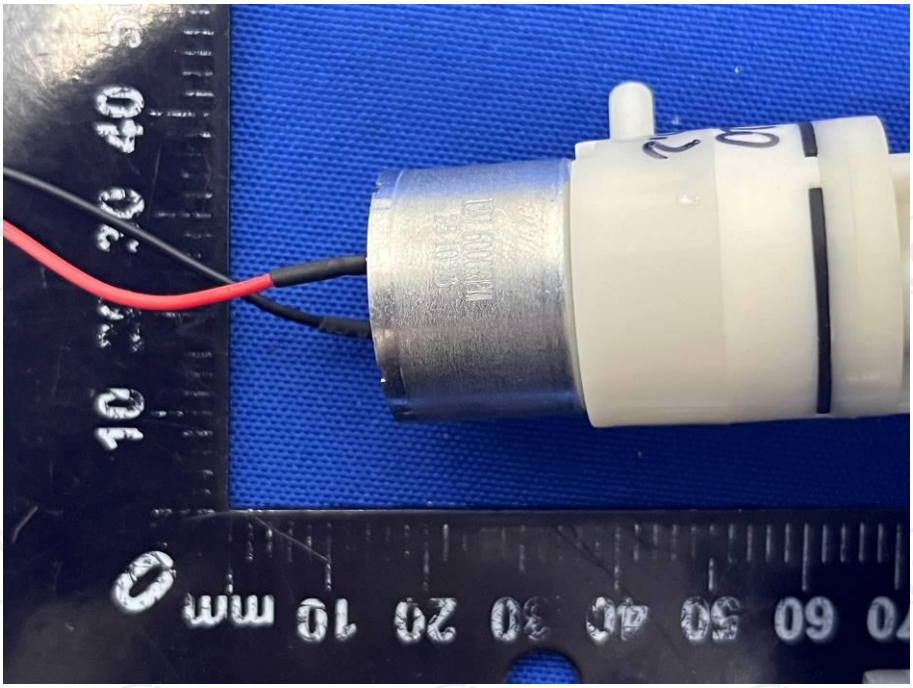

CAUTION! HOT SURFACE
SMOKE

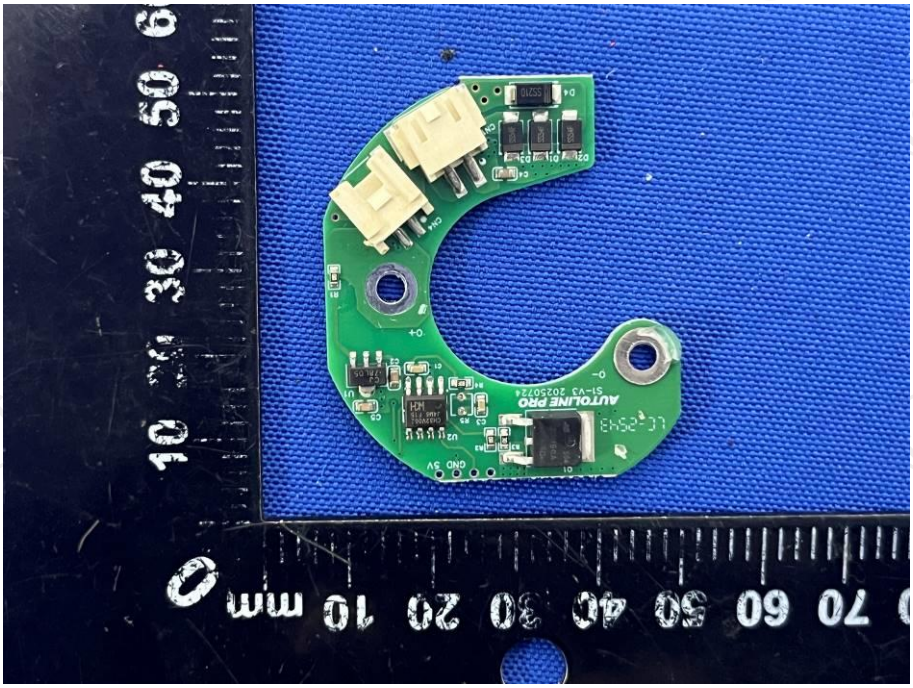


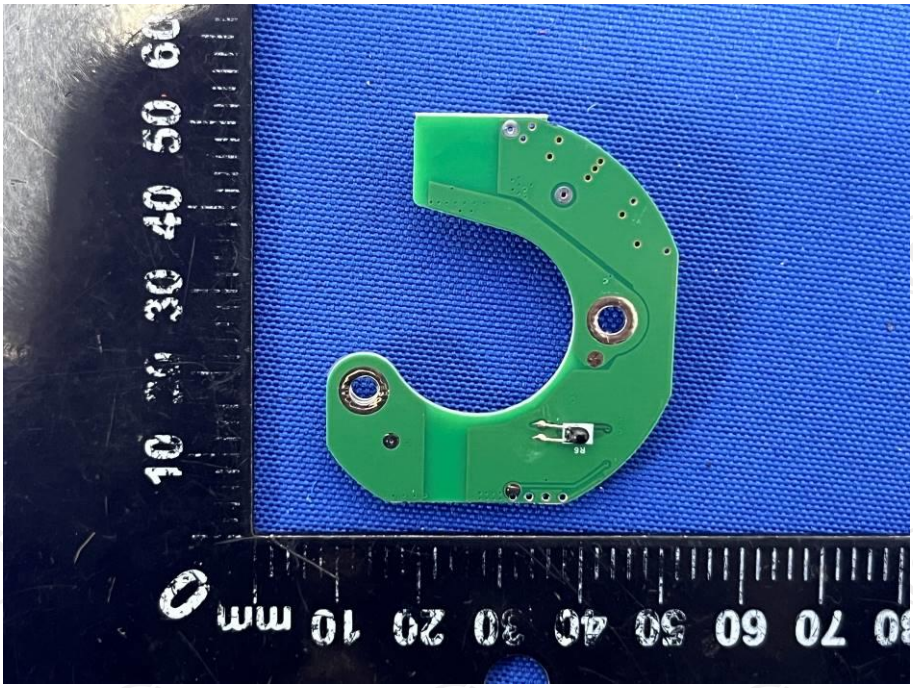

HYPERSMOKE
NOISY DURING USE
LOUD NOISY PUMP IS NORMAL
SMOKE FLUID
CHECK LEVEL BEFORE USE
HOT SURFACE
HANDLE WITH CARE


FILL WITH 1 PACKET ONLY
DO NOT OVERFILL
LLENAR CON SOLO 1 PAQUETE
NO LLENAR EN EXCESO
AUTOLINE PRO









********End of report********

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com