

Vojenský technický ústav, s.p.
odštěpný závod VTÚPV
Víta Nejedlého 691, 682 01 Vyškov, Czech Republic

CERTIFICATE

No VTÚPV - 034 / 2026 / ZAHR

Applicant: **Shanghai Matis Electric Co., Ltd.**
上海麦豆电气有限公司
Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China
201306

Product: **Multi Circuit Multi-Functional Smart Meter**

Tested Model: MPM4410-A
Derived Models: MPM4411-A, MPM4412-A, MPM4420-A, MPM4421-A, MPM4422-A

Manufacturer: **Shanghai Matis Electric Co., Ltd.**
Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China
201306

Rating and principal characteristics: Auxiliary Voltage: 85-305 V AC / 100-430 V DC;
Voltage Input: L-N: 0-400 V/690 V L-L (Wye) or 600V L-L (Delta);
Frequency: 50-60 Hz;
Rated Current Input: 5 A CT, mV CT, Rogowski Coil (mV/kA);
Wiring Connection: 1P+N/3P/3P+N, 4* circuits;
Communication: RS485/Modbus-RTU/ETH/Modbus-TCP

Test results are described in the Test Reports No.:
ENS2510300333E00101R (tests made by EMTEK (SHENZHEN) CO., LTD.)

The sample of tested product conforms with the requirements of the following standards
harmonized with EMC Directive No. 2014/30/EU

- EN IEC 61326-1: 2021
- CISPR 11: 2015 + A1: 2016 + A1: 2019
- EN IEC 61000-3-2: 2019 + A2: 2024
- EN 61000-3-3: 2013 + A2: 2021

This certificate is valid until: **13. 04. 2031**

After preparation of the necessary technical documentation as well as the conformity declaration, the requirements for CE marking can be affixed on the product. Other relevant directives have to be observed.
The CE mark shall appear according to this sample:

CE

Vyškov 13. 04. 2026

Tel./Fax: +420 910 105 580
e-mail: milan.bezdek@vtusp.cz
<http://www.vtusp.cz>


Milan Bezdek
Certification Head



EU DECLARATION OF CONFORMITY

This Is Hereby Declared That Following Designated Product Complied With The Essential

Manufacturer Name: Shanghai Matis Electric Co., Ltd Address: Room318-320, No.83,West Huanghu Road, Pudong, Shanghai, China 201306
Authorized Representative Established Within The Eu: Company Name:Shanghai Matis Electric Co., Ltd Company Address:Shanghai Matis Electric Co., Ltd
Product Name: Multi Circuit Multi-Functional Smart Meter
Model: MPM4410-A,MPM4411-A,MPM4412-A,MPM4420-A,MPM4421-A,MPM4422-A
Trademark: Matis/Matismart
Meets All Relevant Requirements Of The Following European Directives: 2014/30/EU Electromagnetic Compatibility Directive
Applicable Standards: EN IEC 61326-1: 2021

THIS DECLARATION APPLIES TO ALL SPECIMENS MANUFACTURED IDENTICAL TO THE MODELSUBMITTED FOR TESTING / EVALUATION. ASSESSMENT OF COMPLIANCE OF THE PRODUCT WITHTHE REOUIREMENTS RELATING TO SAFETY STANDARDS LISTED ABOVE WAS PERFORMED BYMANUFACTURE.

SIGNED ON BEHALF OF Shanghai Matis Electric Co., Ltd



Title and Signature: Timmy Bao

Date and place: 2026.3.24, Shanghai

Seal: _____





中国认可
国际互认
检测
TESTING
CNAS L3150



Test Report

No.: EDG2510300333C00201R

Date: Mar. 24, 2026

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Applicant : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83,West Huanghu Road, Pudong, Shanghai, China 201306

Sample Name : Multi Circuit Multi-Functional Smart Meter

Style/Item No. : MPM4410-A

Reference No. : MPM4411-A,MPM4412-A,MPM4420-A,MPM4421 -A,MPM4422-A

Brand name : Matis/Matismart

Manufacturer : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83,West Huanghu Road, Pudong, Shanghai, China 201306

Factory : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83,West Huanghu Road, Pudong, Shanghai, China 201306

Received Date : Nov. 11, 2025

Test Period : Nov. 11, 2025 ~ Mar. 24, 2026

Test Requested : As requested by the client, to evaluate the compliance of the submitted sample with EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Test Method : 1. Review was performed for the sample and the related Bill of Materials submitted by the Applicant.
2. a) Refer to the standard IEC 62321-3-1:2013: Screening by XRF Spectroscopy.
b) Wet chemical test
1) Refer to IEC 62321-5:2013, determine the Cadmium, Lead content by ICP-OES.
2) Refer to IEC 62321-4:2013+A1:2017, determine the Mercury content by ICP-OES;
3) Refer to IEC 62321-7-1:2015 & IEC 62321-7-2:2017, determine the Hexavalent Chromium content by UV-VIS.
4) Refer to IEC 62321-6:2015, determine the Polybrominated Biphenyls and Polybrominated Diphenyl Ethers by GC-MS.
5) Refer to IEC 62321-8:2017, determine the Dibutyl phthalate(DBP), Benzylbutyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP) and Diisobutyl phthalate(DIBP) by GC-MS.

Test Results : Please refer to next page (s).

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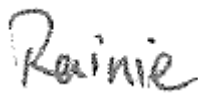
Conclusion:

Basing on the test results obtained from the homogenous materials, the submitted sample **COMPLIES** with the EU RoHS Directive 2011/65/EU Annex II and its amendment (EU) 2015/863.



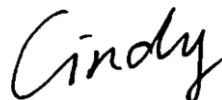
Signed for and on behalf of
EMTEK(Dongguan) Co., Ltd.

Prepared by:



Guan Yongshi, Rainie
Report Engineer

Reviewed by:



Zeng Xingji, Cindy
Supervisor

Approved by:



Li Wei, Lisa
Authorized signatory
Mar. 24, 2026

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Test Results:

1. Pb, Cd, Hg, Cr⁶⁺, PBBs, PBDEs Test Results:

No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
1	SMD capacitor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
2	SMD resister	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
3	SMD resister	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
4	SMD resister	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
5	SMD triode	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
6	SMD resister	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
7	SMD resister	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
8	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	X	ND		
		PBDEs			ND		
9	Copper metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
10	SMD LED	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
11	SMD LED	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
12	SMD LED	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
13	SMD LED	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
14	Button-beige hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
15	Fixed plate-silver metal	Pb	Pb	BL	Cr ⁶⁺ : Negative	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	X			
		PBBs	Br	NA			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
16	Contact plate-silver metal	Pb	Pb	BL	Cr ⁶⁺ : Negative	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	X			
		PBBs	Br	NA			
		PBDEs					
17	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
18	Terminal-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
19	White hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
20	Grey soft plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark	
21	Green PCB	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X	ND			
		PBDEs			ND			
22	Silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
23	Solder-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
24	White hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
25	Silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
26	White plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
27	Transparent hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
28	White plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
29	Silver transparent plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
30	Black plastic film with glue	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
31	Silver translucent plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
32	Black translucent plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
33	Transparent glass	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
34	Black glue	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
35	Brown soft plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
36	White PCB	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
37	SMD LED	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
38	Green PCB	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	X			
		PBDEs					
39	SMD inductor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
40	SMD inductor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark	
41	SMD resister	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
42	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND
43	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
44	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND
45	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
46	SMD capacitor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
47	SMD diode	Pb	Pb	OL	Pb: 24412	Pass	See remark (3)
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
48	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
49	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
50	SMD diode	Pb	Pb	OL	Pb: 24196	Pass	See remark (3)
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
51	White ceramic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
52	Solder with silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
53	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
54	Black solid	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
55	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
56	Magnet ring-grey solid	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
57	Copper enameled wire	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
58	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
59	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
60	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
61	Shell-silver metal with black printing	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
62	Dark silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
63	Bright silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
64	Brown paper	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
65	Black soft plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
66	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
67	Base-black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
68	SMD inductor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
69	SMD diode	Pb	Pb	OL	Pb: 23767	Pass	See remark (3)
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
70	Black solid	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
71	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
72	SMD diode	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
73	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
74	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
75	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark	
76	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
77	SMD IC	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
78	SMD IC	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
79	Green PCB	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND
80	SMD IC	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
81	SMD diode	Pb	Pb	OL	Pb: 30034	Pass	See remark (3)
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
82	Blue solid	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
83	SMD diode	Pb	Pb	OL	Pb: 23414	Pass	See remark (3)
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
84	Solder-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
85	SMD resistor	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
86	Green hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
87	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
88	Shell-brown hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
89	Fuse-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
90	Pin-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
91	Base-black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
92	SMD IC	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
93	Shell-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
94	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	X			
		PBDEs					
95	Pin-copper metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
96	LED-green translucent hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
97	LED-yellow translucent hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
98	LED-pin-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
99	Shell-silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
100	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
101	Pin-copper metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
102	Black solid	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
103	White hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
104	Green plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
105	Copper enameled wire	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
106	Silver foil	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
107	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
108	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	X			
		PBDEs					
109	Yellow plastic film	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
110	Copper enameled wire	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark	
111	Black soft plastic with grey printing	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
112	Shell-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
113	Black solid	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	BL				
		PBDEs						
114	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND
115	Solder-silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						

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No.	Sample description	Restricted substances	Analytical element	Results of EDXRF ⁽¹⁾	Results of Chemical Testing ⁽²⁾ (mg/kg)	Conclusion	Remark
116	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
117	Green PCB	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	X			
		PBDEs					
118	Copper enameled wire	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	BL			
		PBDEs					
119	Silver metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					
120	Copper metal	Pb	Pb	BL	NA	Pass	No comment
		Cd	Cd	BL			
		Hg	Hg	BL			
		Cr ⁶⁺	Cr	BL			
		PBBs	Br	NA			
		PBDEs					

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121	Silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
122	Silver metal	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	NA				
		PBDEs						
123	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND
124	Black hard plastic	Pb	Pb	BL	NA	Pass	No comment	
		Cd	Cd	BL				
		Hg	Hg	BL				
		Cr ⁶⁺	Cr	BL				
		PBBs	Br	X				ND
		PBDEs						ND

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Test Results:

2. Phthalates (DBP, BBP, DEHP, DIBP) Test Results:

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	1+2+3	4+5+6	7+8+10		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	11+12+13	14+17+19	20+21+24		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	26+27+28	29+30+31	32+33+34		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	35+36+37	38+39+40	41+42+44		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

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Test Results:

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	46+47+48	49+50+51	54+56+57		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	58+60+64	65+67+68	69+70+72		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	73+74+75	77+78+79	80+81+82		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

Test Item	Test Result (mg/kg)			MDL (mg/kg)	Requirement Limit (mg/kg)
	83+85+86	88+91+92	94+96+97		
Dibutyl phthalate(DBP)	ND	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	ND	30	1000
Conclusion	Pass	Pass	Pass	---	---

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EMTEK (Dongguan) Co., Ltd. 邮箱: project@emtek.com.cn

Add: Room 111&112, Building 8, -1&2/F., Office Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China [Http://www.emtek.com.cn](http://www.emtek.com.cn) E-mail: project@emtek.com.cn



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Test Results:

Test Item	Test Result (mg/kg)		MDL (mg/kg)	Requirement Limit (mg/kg)
	100+102+103	104+105+108		
Dibutyl phthalate(DBP)	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	30	1000
Conclusion	Pass	Pass	---	---

Test Item	Test Result (mg/kg)		MDL (mg/kg)	Requirement Limit (mg/kg)
	109+110+111	113+114+117		
Dibutyl phthalate(DBP)	ND	ND	30	1000
Benzylbutyl phthalate(BBP)	ND	ND	30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND	ND	30	1000
Diisobutyl phthalate(DIBP)	ND	ND	30	1000
Conclusion	Pass	Pass	---	---

Test Item	Test Result (mg/kg)		MDL (mg/kg)	Requirement Limit (mg/kg)
	118+123+124			
Dibutyl phthalate(DBP)	ND		30	1000
Benzylbutyl phthalate(BBP)	ND		30	1000
Di-2-ethylhexyl phthalate(DEHP)	ND		30	1000
Diisobutyl phthalate(DIBP)	ND		30	1000
Conclusion	Pass		---	---

Note: mg/kg = parts per million = ppm ND = Not Detected (less than MDL) MDL = Method Detection Limit

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EMTEK (Dongguan) Co., Ltd. 邮箱: project@emtek.com.cn
Add: Room 111&112, Building 8, -1&2/F., Office Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China [Http://www.emtek.com.cn](http://www.emtek.com.cn) E-mail: project@emtek.com.cn



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Test Materials List:

Item No.	Description
1	SMD capacitor
2	SMD resister
3	SMD resister
4	SMD resister
5	SMD triode
6	SMD resister
7	SMD resister
8	Black hard plastic
10	SMD LED
11	SMD LED
12	SMD LED
13	SMD LED
14	Button-beige hard plastic
17	Black hard plastic
19	White hard plastic
20	Grey soft plastic
21	Green PCB
24	White hard plastic
26	White plastic film
27	Transparent hard plastic
28	White plastic film
29	Silver transparent plastic film
30	Black plastic film with glue
31	Silver translucent plastic film
32	Black translucent plastic film
33	Transparent glass
34	Black glue
35	Brown soft plastic
36	White PCB

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Item No.	Description
37	SMD LED
38	Green PCB
39	SMD inductor
40	SMD inductor
41	SMD resister
42	Black hard plastic
44	Black hard plastic
46	SMD capacitor
47	SMD diode
48	SMD IC
49	SMD IC
50	SMD diode
51	White ceramic
54	Black solid
56	Magnet ring-grey solid
57	Copper enameled wire
58	SMD IC
60	SMD IC
64	Brown paper
65	Black soft plastic
67	Base-black hard plastic
68	SMD inductor
69	SMD diode
70	Black solid
72	SMD diode
73	SMD IC
74	SMD IC
75	Black hard plastic
77	SMD IC
78	SMD IC

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Item No.	Description
79	Green PCB
80	SMD IC
81	SMD diode
82	Blue solid
83	SMD diode
85	SMD resister
86	Green hard plastic
88	Shell-brown hard plastic
91	Base-black hard plastic
92	SMD IC
94	Black hard plastic
96	LED-green translucent hard plastic
97	LED-yellow translucent hard plastic
100	Black hard plastic
102	Black solid
103	White hard plastic
104	Green plastic film
105	Copper enameled wire
108	Black hard plastic
109	Yellow plastic film
110	Copper enameled wire
111	Black soft plastic with grey printing
113	Black solid
114	Black hard plastic
117	Green PCB
118	Copper enameled wire
123	Black hard plastic
124	Black hard plastic

Note: As specified by the client, the samples were subjected to mixed testing.

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- Remark: (1) ① Results are obtained by XRF for primary screening, and further wet chemical testing by ICP-OES / AAS (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if an inconclusive result was found (as "X" in below table) (unit: mg/kg).
- ② OL = Over Limit, BL = Below Limit, X = Inconclusive, NA= Not Applicable.
- ③ XRF screening test for RoHS elements – The test result may be different from the actual content in the non-uniformity composition sample.

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	NA	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

(2) ① mg/kg = ppm = 0.0001%, ND = Not Detected (less than MDL), MDL = Method Detection Limit.

② Unit, Method Detection Limit (MDL) and Requirement limit in wet chemical test.

Test items	Pb	Cd	Hg	Cr ⁶⁺ (Non-metal)	Cr ⁶⁺ (metal)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	2	2	2	8	---	5	5
Requirement Limit	1000	100	1000	1000	Negative	1000	1000

③ According to IEC 62321-7-1:2015, result on Cr⁶⁺ for metal sample shall be shown as Positive/Negative.

- a) The Cr(VI) concentration is more than 0.13 µg/cm², the sample is positive for Cr(VI), the coating is considered to contain Cr(VI).
- b) The Cr(VI) concentration is less than 0.10 µg/cm², the sample is negative for Cr(VI), the coating is considered a non-Cr(VI) based coating.

Storage condition and production date of the tested sample are unavailable and thus results of Cr⁶⁺ represent status of the sample at the time of testing.

④ According to IEC 62321-3-1:2013, this column represents the results of wet chem test. And "NA" means no need to perform wet chem test, when the XRF screening results are acceptable.

(3) As declared by the client, No.47,50,69,81,83 the material should be exempted for lead content requirement according to Annex III clause 7(c)-I.

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Sample Photo



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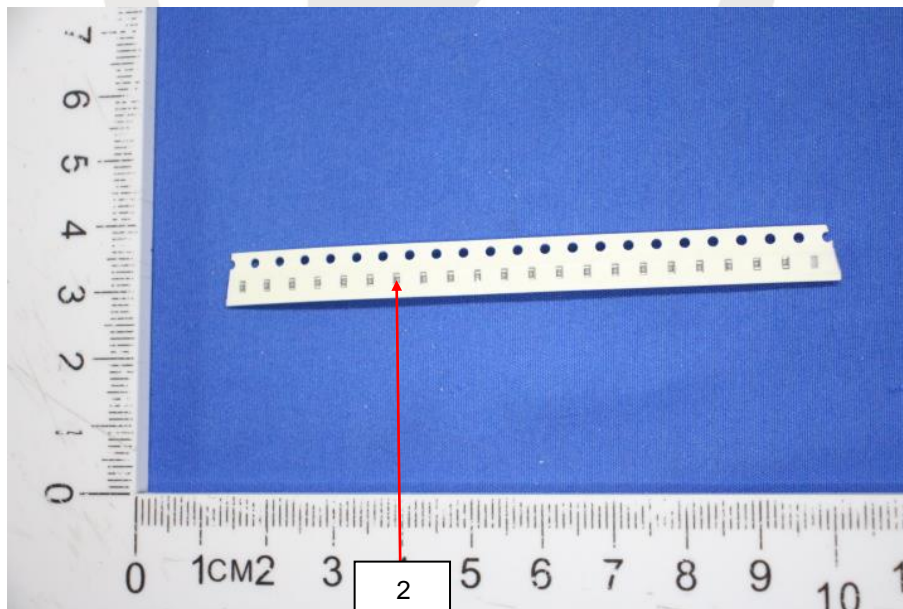
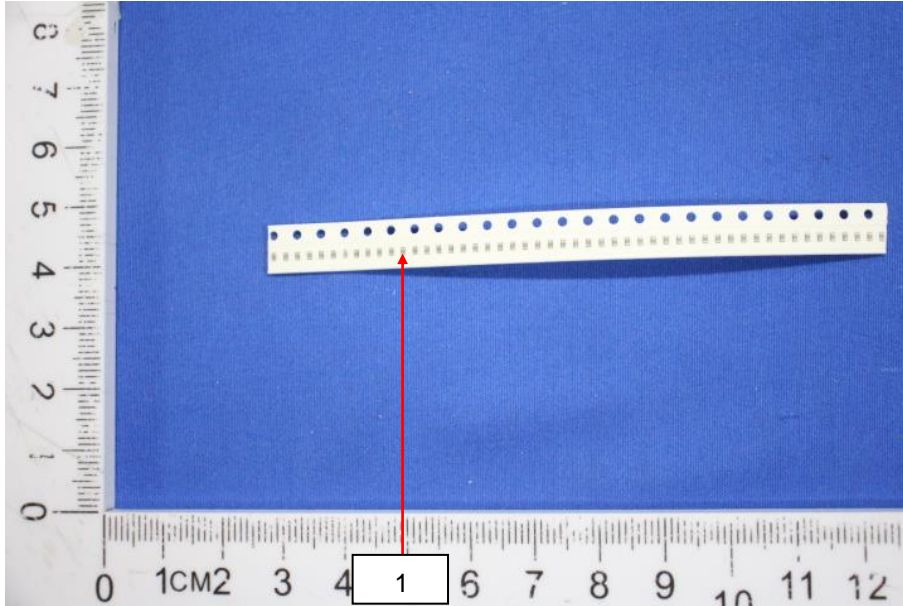
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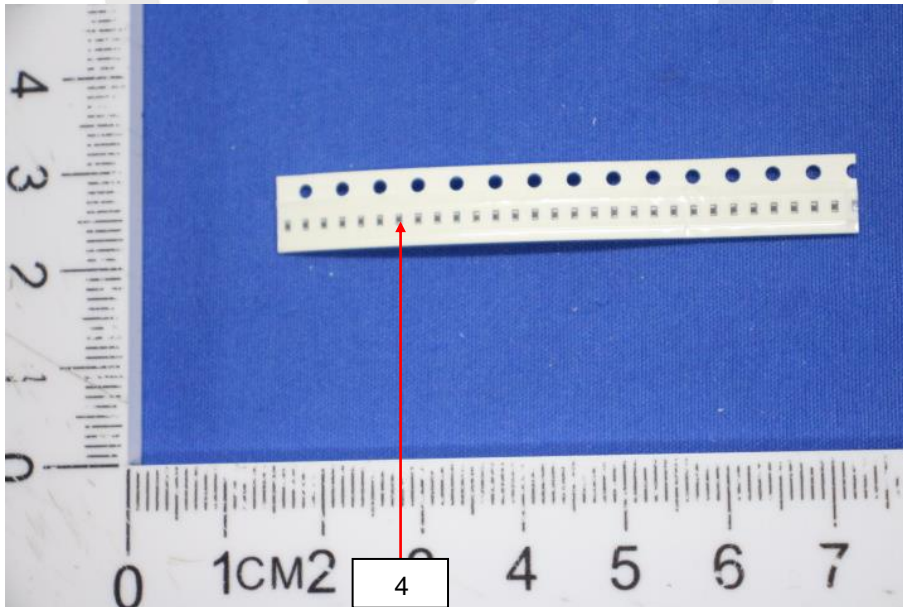
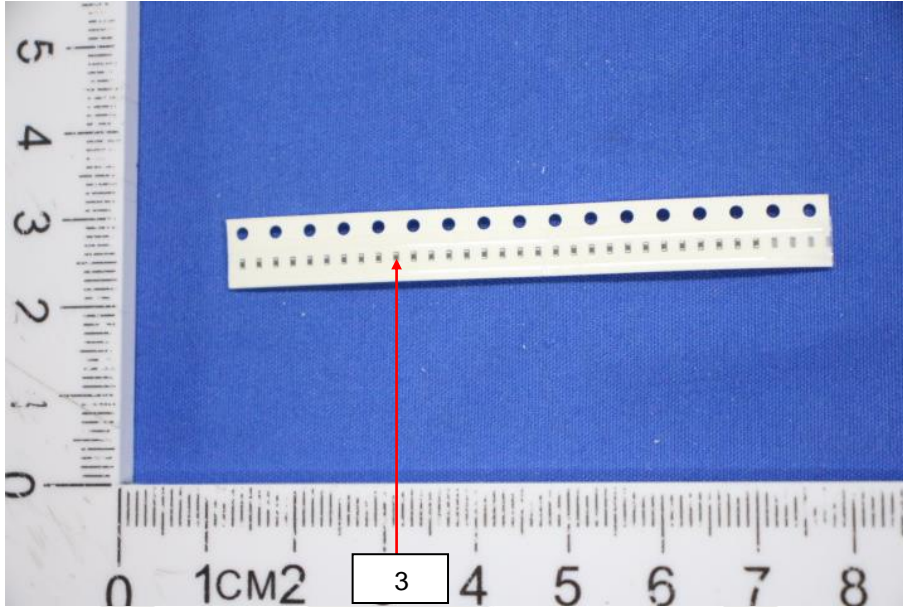
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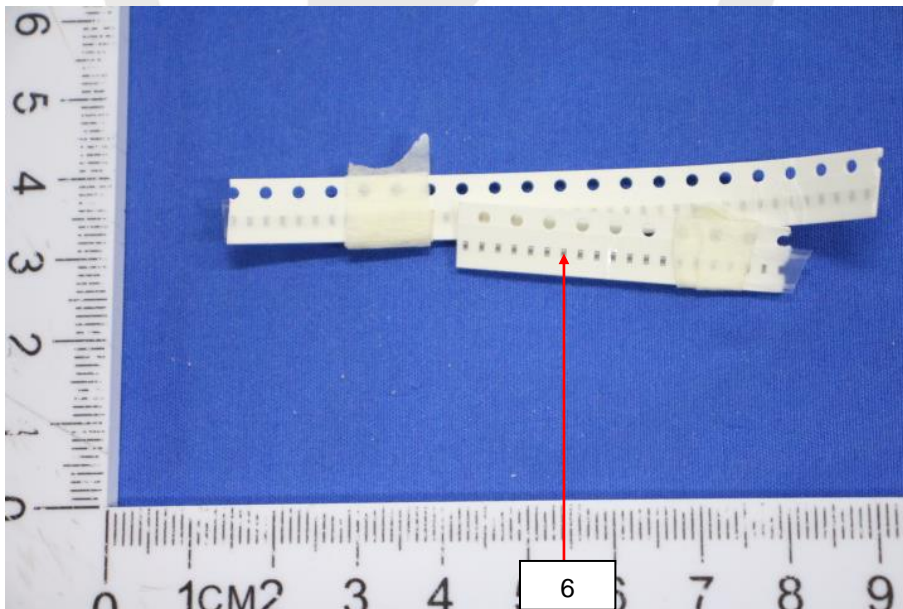
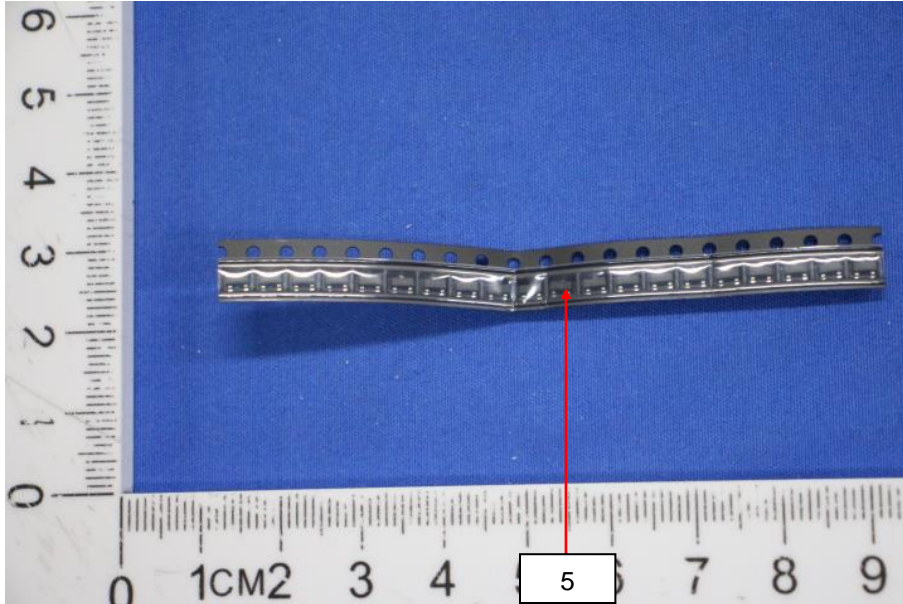
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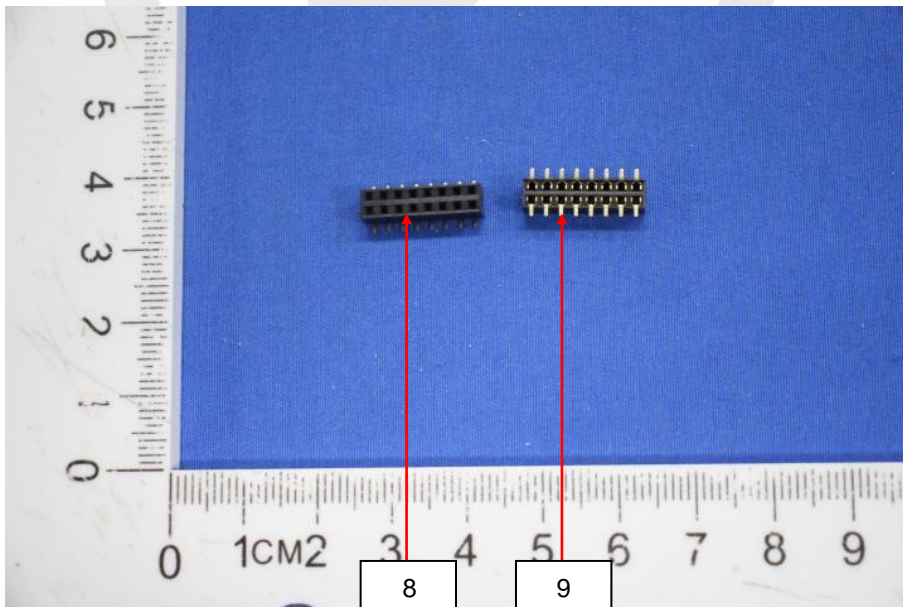
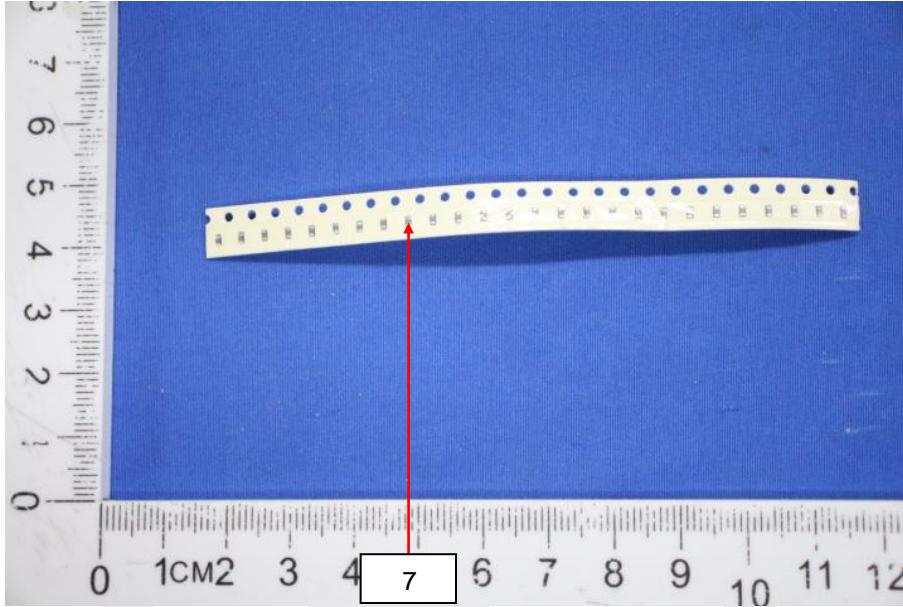
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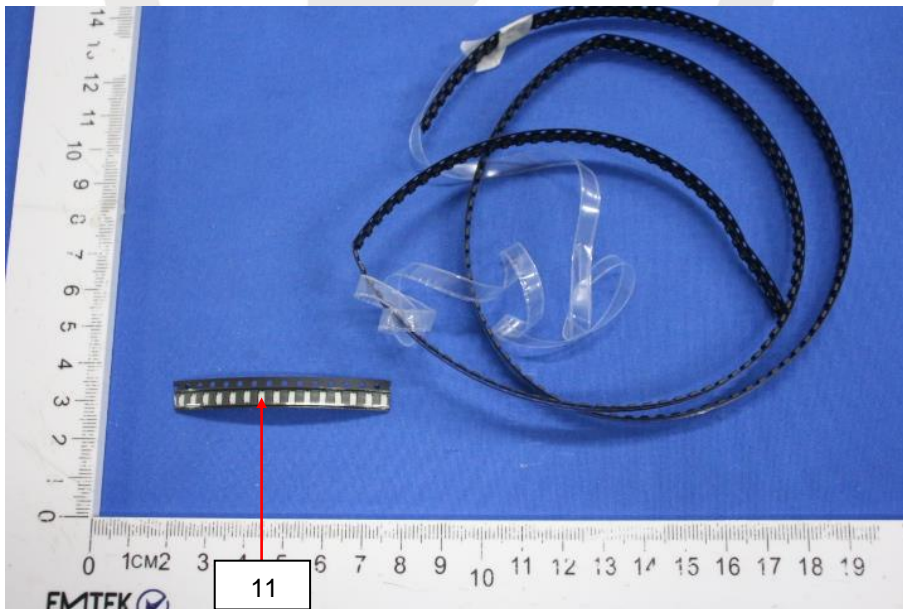
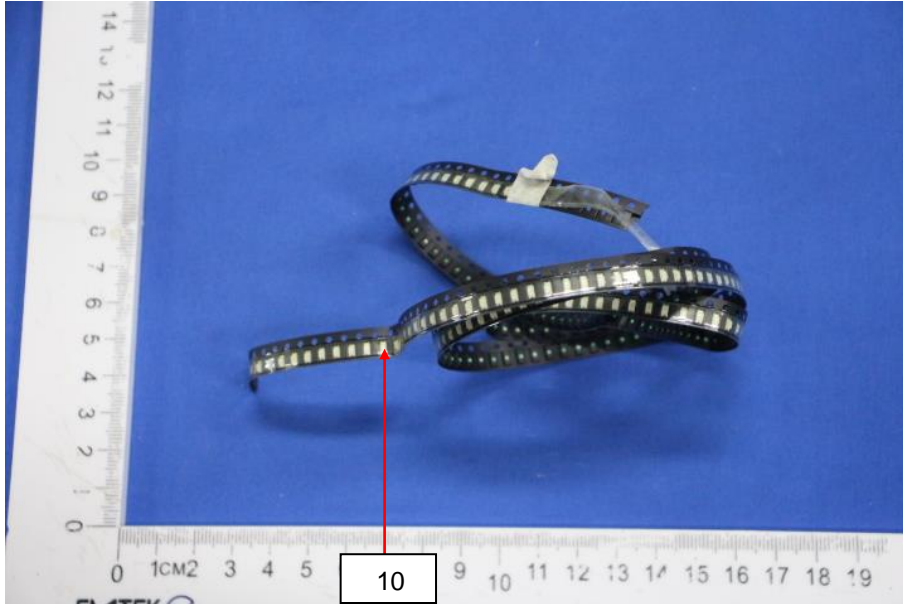
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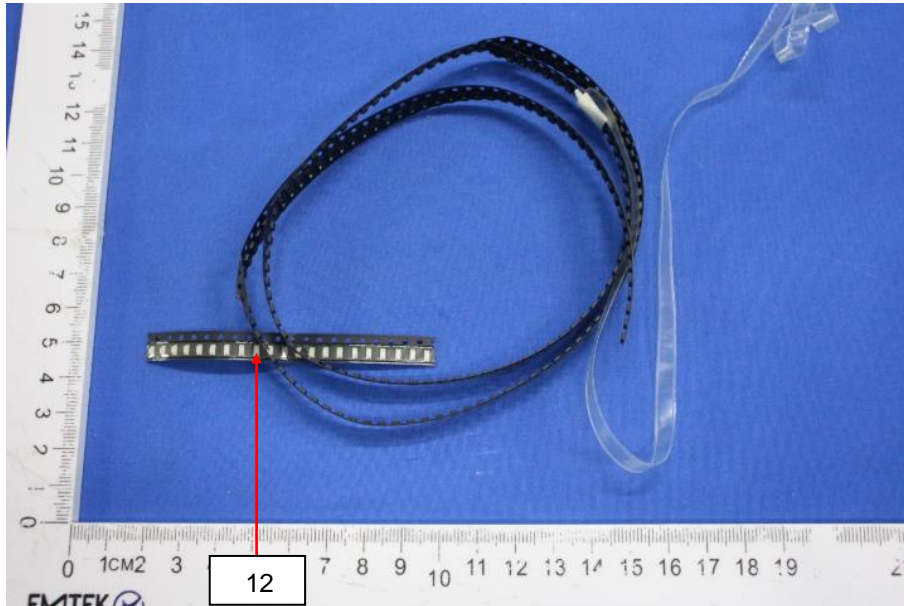
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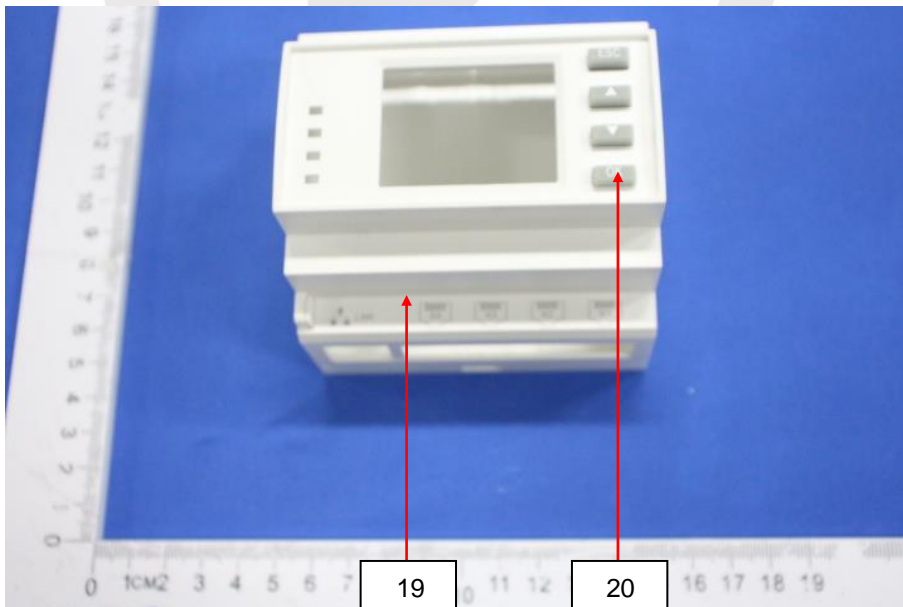
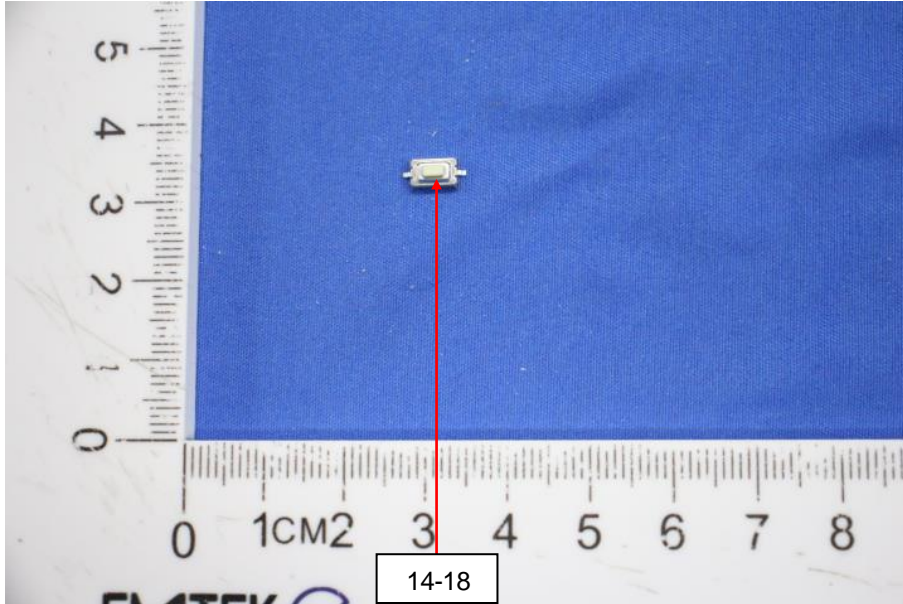
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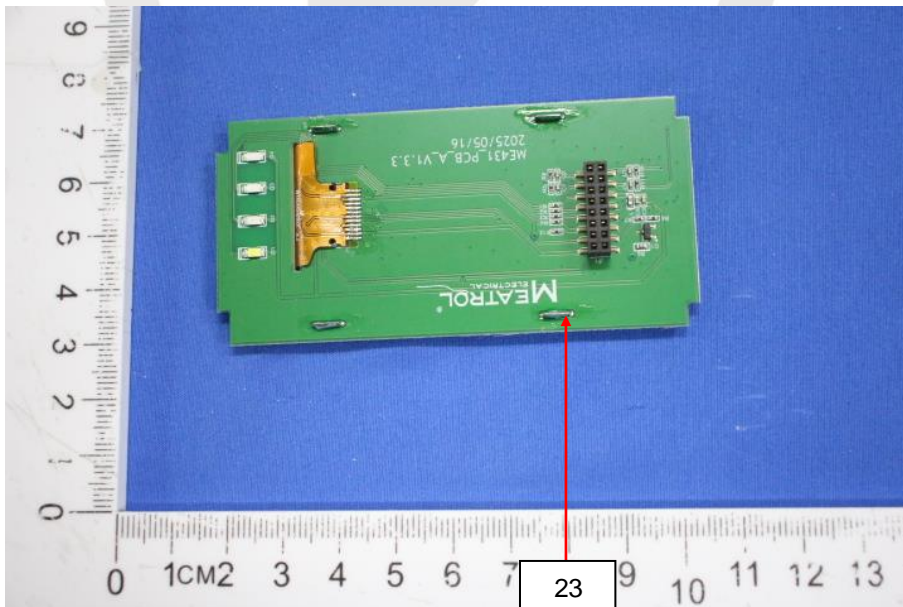
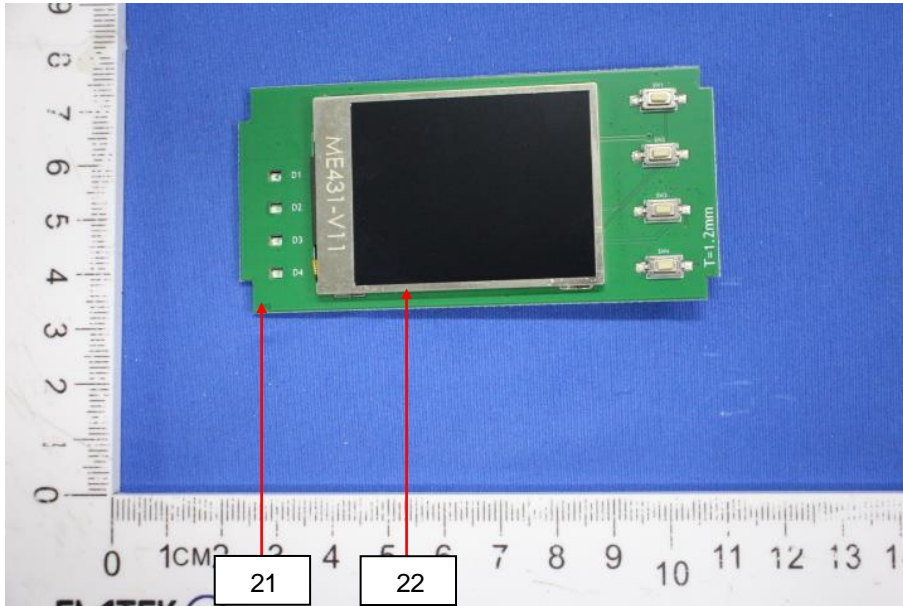
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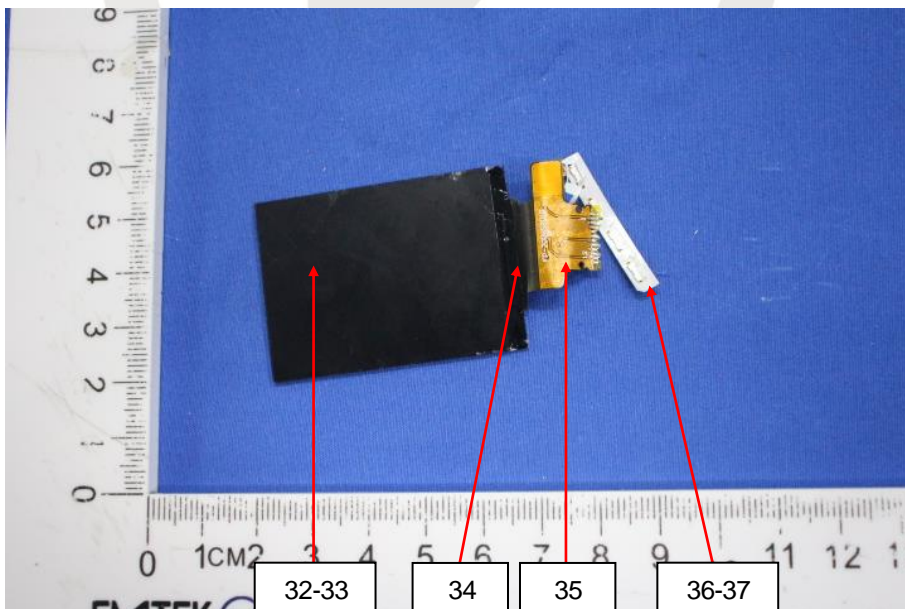
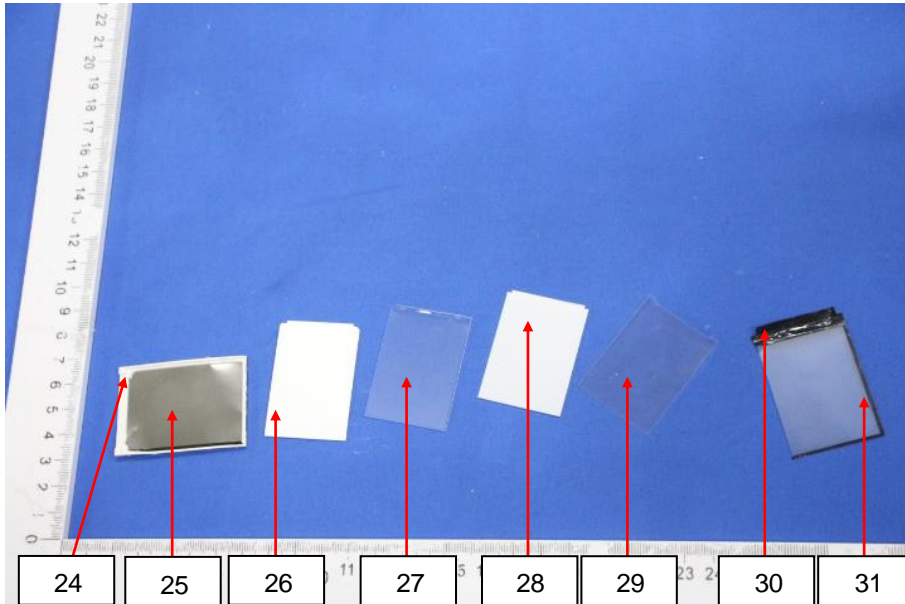
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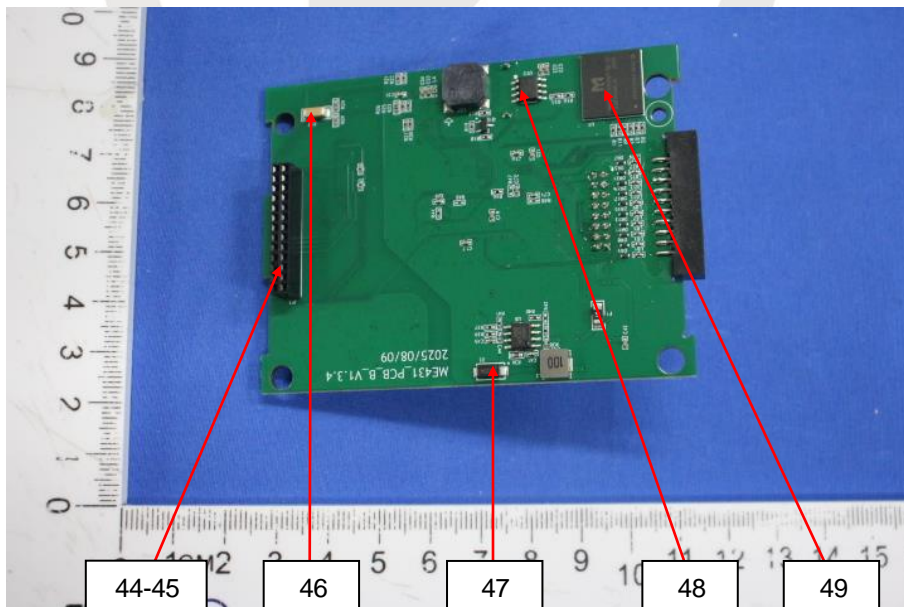
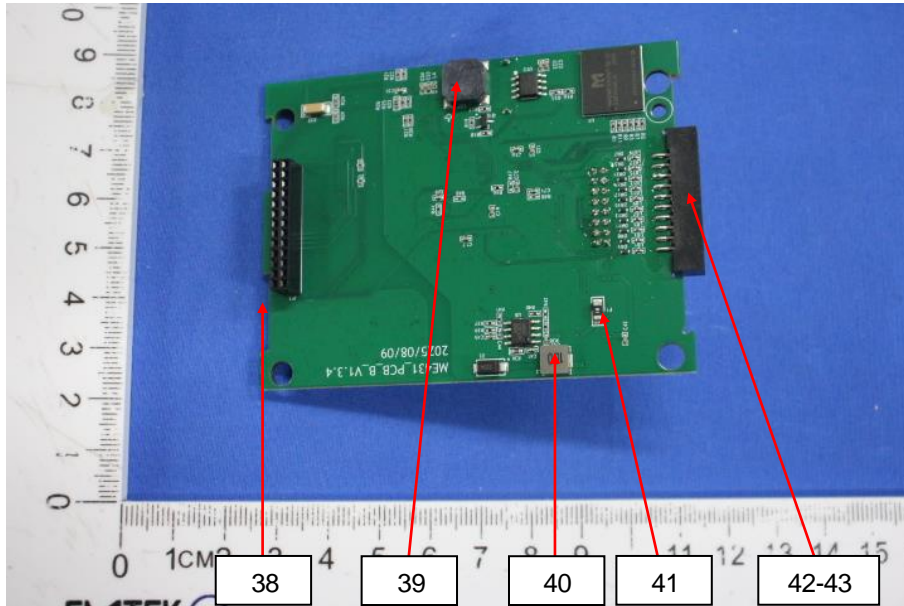
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Sample Photo



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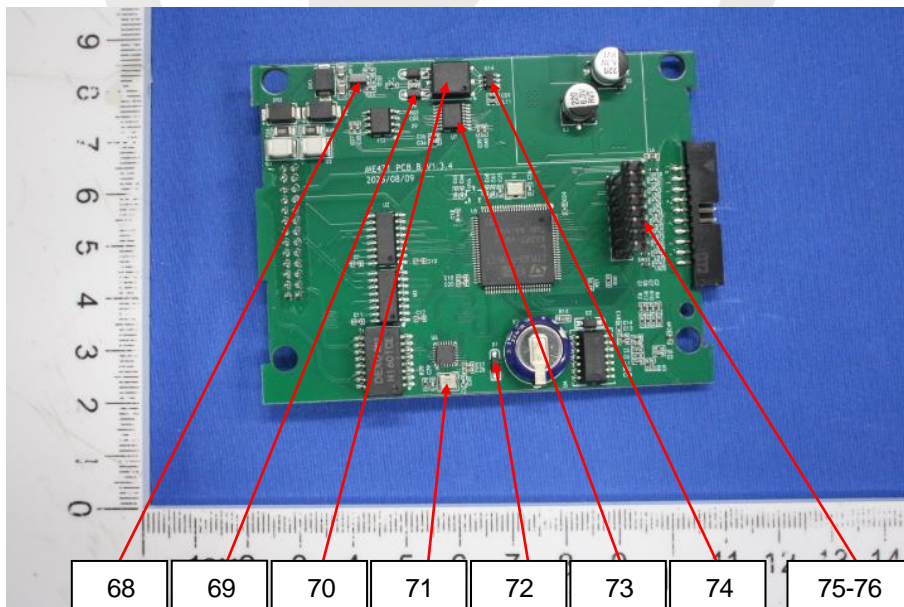
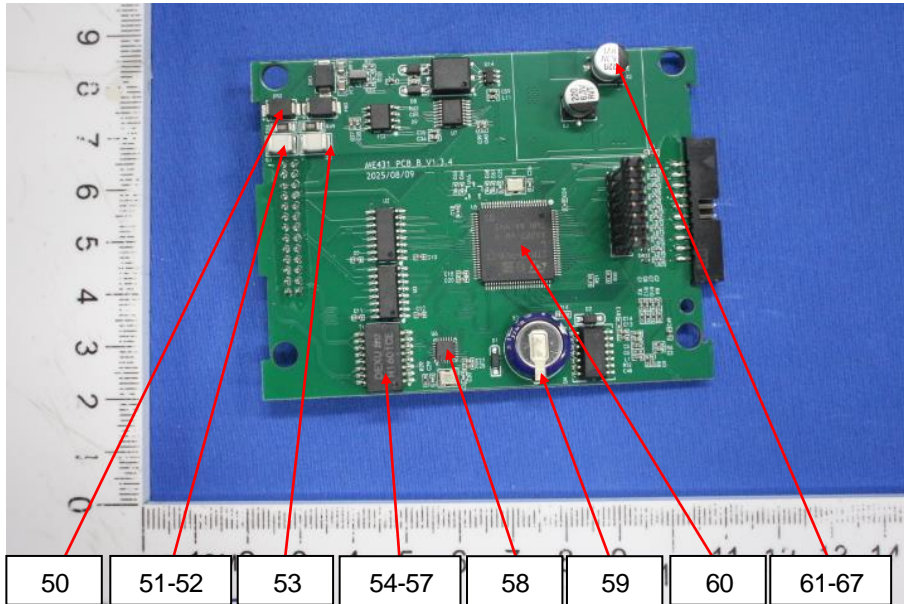
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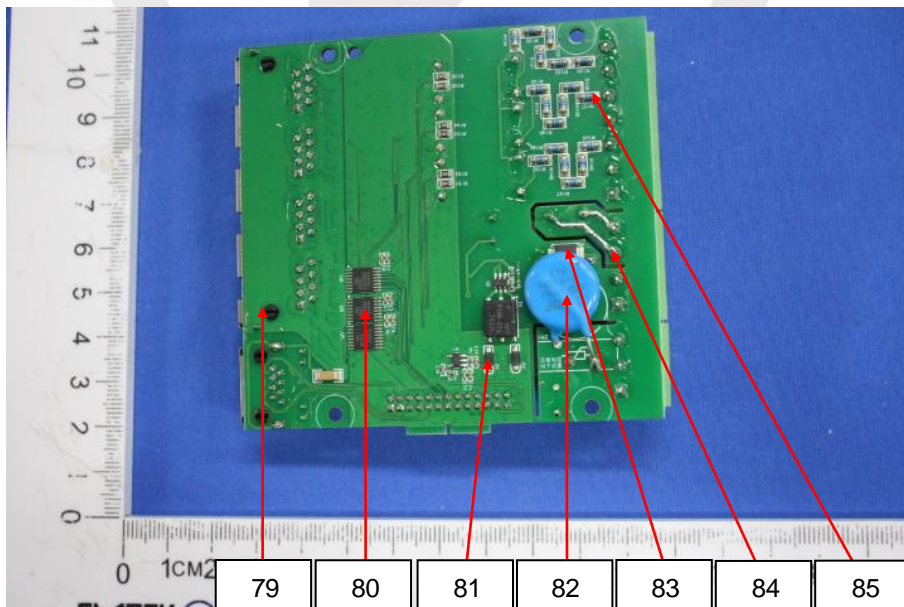
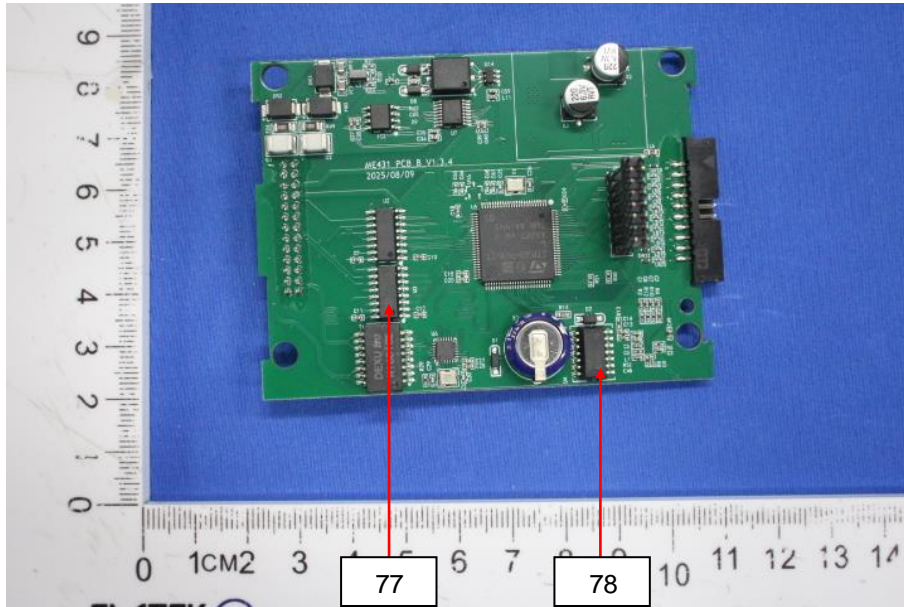
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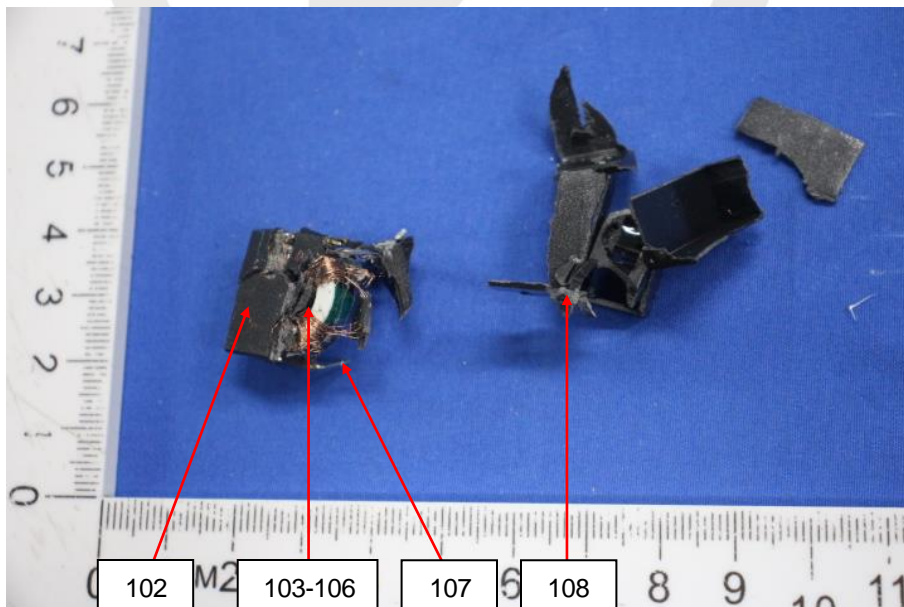
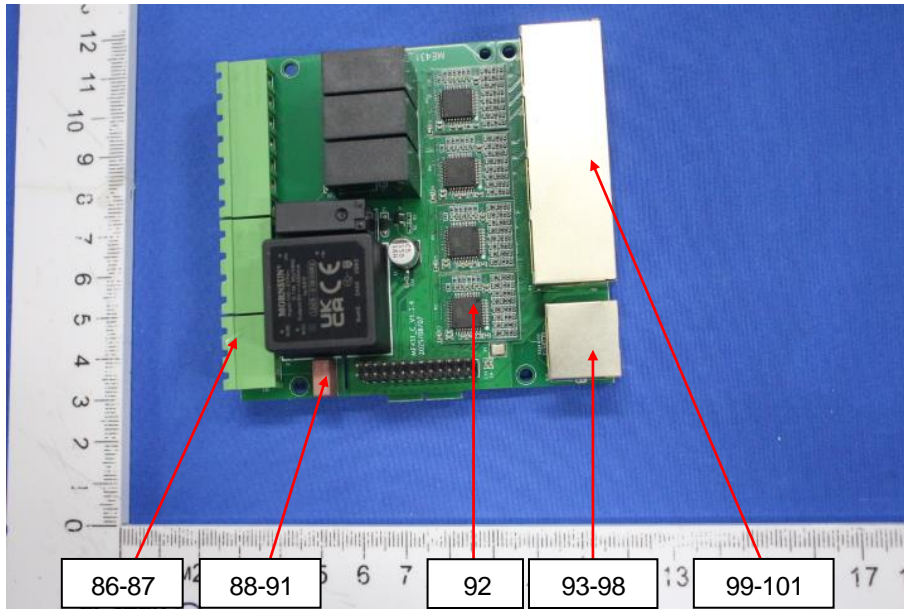
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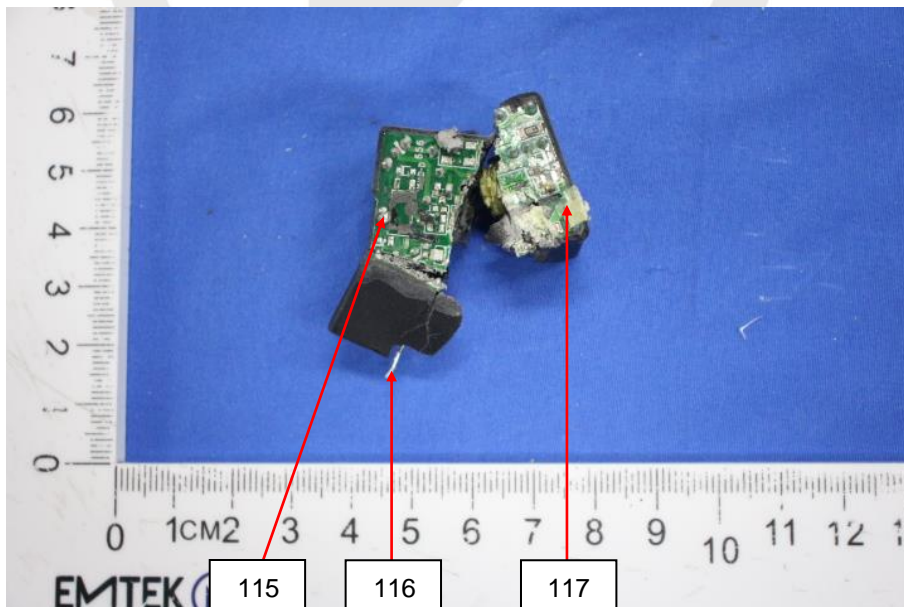
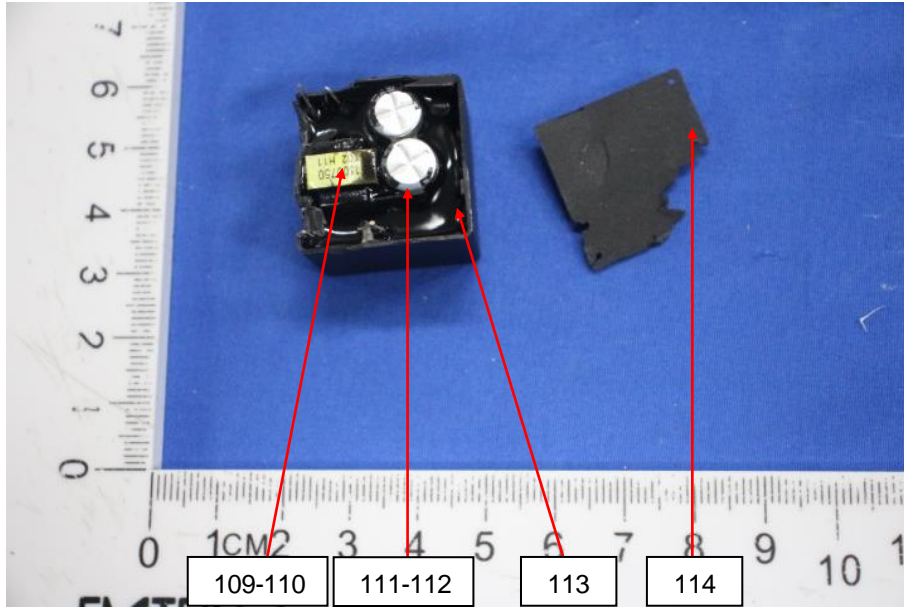
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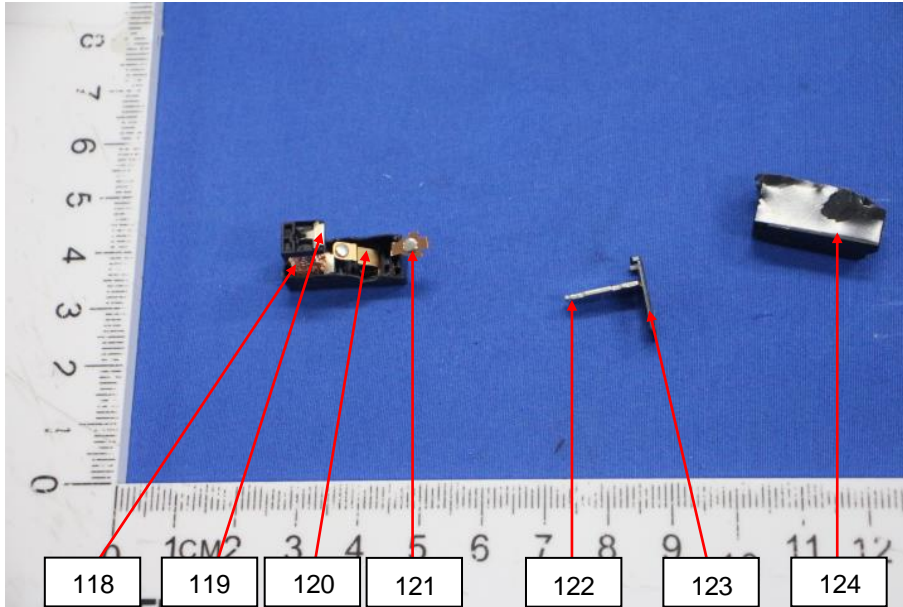
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ANNEX

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- 1 Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):
 - 1(a) For general lighting purposes < 30W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011 until 31 December 2012; 2.5mg shall be used per burner after 31 December 2012)
 - 1(b) For general lighting purposes \geq 30W and <50W: 5mg (expires on 31 December 2011; 3.5mg may be used per burner after 31 December 2011)
 - 1(c) For general lighting purposes \geq 50W and <150W: 5mg
 - 1(d) For general lighting purposes \geq 150W: 15mg
 - 1(e) For general lighting purposes with circular or square structural shape and tube diameter \leq 17mm (no limitation of use until 31 December 2011; 7mg may be used per burner after 31 December 2011)
 - 1(f) For special purposes: 5mg
 - 1(g) For general lighting purposes < 30 W with a lifetime equal or above 20 000 h: 3,5 mg (Expires on 31 December 2017)
- 2(a) Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):
 - 2(a)(1) Tri-band phosphor with normal lifetime and a tube diameter < 9mm (e.g. T2): 5mg (expires on 31 December 2011; 4mg may be used per lamp after 31 December 2011)
 - 2(a)(2) Tri-band phosphor with normal lifetime and a tube diameter \geq 9mm and \leq 17mm (e.g. T5): 5mg (expires on 31 December 2011; 3mg may be used per lamp after 31 December 2011)
 - 2(a)(3) Tri-band phosphor with normal lifetime and a tube diameter > 17mm and \leq 28mm (e.g. T8): 5mg (expires on 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
 - 2(a)(4) Tri-band phosphor with normal lifetime and a tube diameter > 28mm (e.g. T12): 5mg (expires on 31 December 2012; 3.5mg may be used per lamp after 31 December 2012)
 - 2(a)(5) Tri-band phosphor with long lifetime (\geq 25000h): 8mg (expires on 31 December 2011; 5mg may be used per lamp after 31 December 2011)
- 2(b) Mercury in other fluorescent lamps not exceeding (per lamp):
 - 2(b)(2) Non-linear halophosphate lamps (all diameters): 15mg (expires on 13 April 2016)
 - 2(b)(3) Non-linear tri-band phosphor lamps with tube diameter > 17mm (e.g. T9) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
 - 2(b)(4) Lamps for other general lighting and special purposes (e.g. induction lamps) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
- 3 Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):
 - 3(a) Short length (\leq 500mm) (No limitation of use until 31 December 2011; 3.5mg may be used per lamp after 31 December 2011)
 - 3(b) Medium length (> 500mm and \leq 1500mm) (No limitation of use until 31 December 2011; 5mg may be used per lamp after 31 December 2011)
 - 3(c) Long length (> 1500mm) (No limitation of use until 31 December 2011; 13mg may be used per lamp after 31 December 2011)
- 4(a) Mercury in other low pressure discharge lamps (per lamp) (no limitation of use until 31 December 2011; 15mg may be used per lamp after 31 December 2011)
- 4(b) Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 60$:
 - 4(b)-I $P \leq 155W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
 - 4(b)-II $155W < P \leq 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
 - 4(b)-III $P > 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
- 4(c) Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):
 - 4(c)-I $P \leq 155W$ (no limitation of use until 31 December 2011; 25mg may be used per burner after 31 December 2011)
 - 4(c)-II $155W < P \leq 405W$ (no limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011)
 - 4(c)-III $P > 405W$ (no limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011)
- 4(d) Mercury in High Pressure Mercury (vapour) lamps (HPMV) (expires on 13 April 2015)
- 4(e) Mercury in metal halide lamps (MH)
- 4(f) Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex
- 4(g) Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-art work, where the mercury content shall be limited as follows: (Expires on 31 December 2018)
 - (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C;
 - (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.

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东莞市信测科技有限公司 地址: 广东省东莞市松山湖高新技术产业开发区新城大道9号中大海洋生物技术研发基地A区2号办公楼 负一层、第二层/8栋111室、112室 网址: [Http://www.emtek.com.cn](http://www.emtek.com.cn)
EMTEK (Dongguan) Co., Ltd. 邮箱: project@emtek.com.cn

Add: Room 111&112, Building 8, -1&2/F., Office Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China [Http://www.emtek.com.cn](http://www.emtek.com.cn) E-mail: project@emtek.com.cn



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- 5(a) Lead in glass of cathode ray tubes
- 5(b) Lead in glass of fluorescent tubes not exceeding 0.2% by weight
- 6(a) Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight
- 6(b) Lead as an alloying element in aluminium containing up to 0.4% lead by weight
- 6(c) Copper alloy containing up to 4% lead by weight.
- 7(a) Lead in high melting temperature type solders (i.e. lead based alloys containing 85% by weight or more lead)
- 7(b) Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications
- 7(c)-I Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound
- 7(c)-II Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250V DC or higher
- 7(c)-III Lead in dielectric ceramic in capacitors for a rated voltage of less than 125V AC or 250V DC (expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013).
- 7(c)-IV Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors
- 8(a) Cadmium and its compounds in one shot pellet type thermal cut-offs (expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012)
- 8(b) Cadmium and its compounds in electrical contacts
Applies to categories 8, 9 and 11 and expires on:
— 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments;
— 21 July 2023 for category 8 in vitro diagnostic medical devices;
— 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11
- 8(b)-I Cadmium and its compounds in electrical contacts used in:
Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
— circuit breakers,
— thermal sensing controls,
— thermal motor protectors (excluding hermetic thermal motor protectors),
— AC switches rated at:— 6 A and more at 250 V AC and more, or
— 12 A and more at 125 V AC and more,
— DC switches rated at 20 A and more at 18 V DC and more, and
— switches for use at voltage supply frequency ≥ 200 Hz.
- 9 Hexavalent chromium as an anti-corrosion agent of the carbon steel cooling system in absorption refrigerators up to 0.75% by weight in the cooling solution
- 9(b) Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications
- 11(b) Lead used in other than C-press compliant pin connector systems (expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013)
- 13(a) Lead in white glasses used for optical applications
- 13(b) Cadmium and lead in filter glasses and glasses used for reflectance standards
- 14 Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight (expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011)
- 15 Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
- 17 Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
- 18(b) Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($\text{BaSi}_2\text{O}_5:\text{Pb}$)
- 21 Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glass
- 24 Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
- 25 Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring
- 29 Lead bound in crystal glass as defined in Annex 1 (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
- 30 Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more

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东莞市信测科技有限公司 地址: 广东省东莞市松山湖高新技术产业开发区新城大道9号中大海洋生物科技研发基地A区2号办公楼负一层、第二层/8栋111室、112室 网址: [Http://www.emtek.com.cn](http://www.emtek.com.cn)
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- 31 Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)
- 32 Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
- 33 Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers
- 34 Lead in cermet-based trimmer potentiometer elements
- 37 Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
- 38 Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide
- 39 Cadmium in colour converting II-VI LEDs ($< 10 \mu\text{g Cd per mm}^2$ of light-emitting area) for use in solid state illumination or display systems (expires on 1 July 2014)
- 41 Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council (2)) (Expires on 31 December 2018)
- 43 Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and concentration value of bis(2-ethylhexyl) phthalate does not exceed:
- a) 30% by weight of the rubber for
 - (i) gasket coatings;
 - (ii) solid-rubber gaskets; or
 - (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine.
 - b) 10% by weight of the rubber for rubber-containing components not referred to in point (a).
- For the purposes of this entry, "prolonged contact with human skin" means continuous contact of more than 10 minutes duration or intermittent contact over a period of 30 minutes, per day.
- 44 Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council, installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users.

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EMTEK (Dongguan) Co., Ltd. 邮箱: project@emtek.com.cn

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EMTEK (Dongguan) Co., Ltd. 邮箱: project@emtek.com.cn

Add: Room 111&112, Building 8, -1&2/F., Office Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China Http://www.emtek.com.cn E-mail: project@emtek.com.cn



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Test results are only responsible for delivered samples. This test report is issued by the company and is intended for your exclusive use. This test report includes all of the testes requested by you and the results thereof based upon the information that you provided. You have 30 days from data of issuance of this test report to notify us of any error or omission caused by our negligence. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.





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TEST REPORT

Product Name : **Multi Circuit Multi-Functional Smart Meter**
Model Number : **MPM4410-A, MPM4411-A, MPM4412-A, MPM4420-A, MPM4421-A, MPM4422-A**

Prepared for : Shanghai Matis Electric Co.Ltd
Address : Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China 201306

Prepared by : EMTEK (SHENZHEN) CO., LTD.
Address : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

Tel: (0755) 26954280
Fax: (0755) 26954282

Report Number : ENS2510300333E00101R
Date(s) of Tests : November 11, 2025 to March 20, 2026
Date of issue : March 24, 2026



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APPENDIX (Photos of EUT)

TEST REPORT DESCRIPTION

Applicant : Shanghai Matis Electric Co.Ltd
Manufacturer : Shanghai Matis Electric Co.Ltd
Trademark : Matis/Matismart
Product Name : Multi Circuit Multi-Functional Smart Meter
Model Number : MPM4410-A, MPM4411-A, MPM4412-A, MPM4420-A, MPM4421-A, MPM4422-A
Power Supply : Auxiliary voltage : 85 – 305VAC / 100 – 430VDC
Voltage Input: L-N: 0-400V/690V L-L (Wye) or 600V L-L (Delta)
Frequency: 50-60Hz
Rated Current input:5A CT , mV CT, Rogowski Coil (mV/kA)
Wiring Connection: 1P+N/3P/3P+N, 4* circuits
Communication: RS485/Modbus-RTU ETH/Modbus-TCP

Measurement Procedure Used:

EN IEC 61326-1:2021
CISPR 11:2015+A1:2016+A2:2019
EN IEC 61000-3-2:2019+A2:2024
EN 61000-3-3:2013+A2:2021
(IEC 61000-4-2:2008, IEC 61000-4-3:2006+A1:2007+A2:2010, IEC 61000-4-4:2012, IEC 61000-4-5:2014+A1:2017, IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2020)

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN IEC 61326-1 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : November 11, 2025 to March 20, 2026

Prepared by : 
Yuan Yuxiang/Editor

Reviewer : 
Guo Kaimin/Supervisor

Approved & Authorized Signer : 
Wang Li/Manager

Modified Information

Version	Report No.	Revision Data	Summary
/	ENS2510300333E00101R	/	Original Version



1. SUMMARY OF TEST RESULTS

EMISSION(EN IEC 61326-1:2021)			
Description of Test Item	Standard	Limits	Results
Conducted Disturbance at Mains Terminals	CISPR 11:2015+A1:2016 +A2:2019	Group 1 Class B	Pass
Radiated Disturbance	CISPR 11:2015+A1:2016 +A2:2019	Group 1 Class B	Pass
Harmonic Current Emissions	EN IEC 61000-3-2:2019+A2:2024	Class A	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A2:2021	Section 5	Pass
IMMUNITY (EN IEC 61326-1:2021)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2006+A1:2007+A2:2010	A	Pass
EFT/B Immunity	IEC 61000-4-4:2012	B	Pass
Surge Immunity	IEC 61000-4-5:2014+A1:2017	B	Pass
Conducted RF Immunity	IEC 61000-4-6:2013	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8:2009	A	Pass
Voltage dips and interruptions	IEC 61000-4-11:2020	B,C	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product Name : Multi Circuit Multi-Functional Smart Meter

Model Number : MPM4410-A, MPM4411-A, MPM4412-A, MPM4420-A, MPM4421-A, MPM4422-A
(These models are identical in circuitry and electrical, mechanical and physical construction; the only differences are the trade name and model number. for trading purpose. We prepare MPM4410-A for test.)

Sample ID : ENS2510300333E001-01

Test Voltage : AC 230V/50Hz, AC 400V/50Hz

Applicant : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China 201306

Manufacturer : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China 201306

Factory : Shanghai Matis Electric Co.Ltd

Address : Room318-320, No.83, West Huanghu Road, Pudong, Shanghai, China 201306

Date of Received : November 11, 2025

Date of Test : November 11, 2025 to March 20, 2026

2.2. Independent Operation Modes

A. On

2.3. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted Disturbance at Mains Terminals	AC 230V/50Hz, AC 400V/50Hz	Mode A	Mode A
Radiated emissions at frequencies up to 1 GHz	AC 230V/50Hz, AC 400V/50Hz	Mode A	Mode A
Harmonic Current Emissions	AC 400V/50Hz	Mode A	\
Voltage Fluctuation and Flicker	AC 400V/50Hz	Mode A	\
EMS	AC 230V/50Hz, AC 400V/50Hz	Mode A	\



2.4. Description of Test Facility

Site Description

EMC Lab.

: **Accredited by CNAS**

The Certificate Registration Number is L2291.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by A2LA

The Certificate Number is 4321.01.

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0008

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2.5. Description of Support Device

Laptop

: Manufacturer: Lenovo

M/N: WB0205140E

S/N: WB06355728

CE, FCC: DOC

2.6. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty (Conduction 2#)	: 3.16dB (9k~150kHz Conduction) 2.90dB (150k~30MHz Conduction)
Radiated Emission Uncertainty (3m 1# Chamber)	: 3.92dB (30M~1GHz Polarize: H) 4.54dB (30M~1GHz Polarize: V)
Uncertainty for Flicker test	: 0.514%
Uncertainty for Harmonic test	: 4.04%
Uncertainty for C/S Test	: 0.94dB(Using CDN Test) 2.37dB(Using EM Clamp Test)
Uncertainty for R/S Test	: 1.53dB(80MHz-3000MHz)
Uncertainty for test site temperature and humidity	: 0.6°C 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESCI	101045	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	PULSE LIMITER	Schwarzbeck	VTSD 9561 F-B	00955	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	AMN	Rohde & Schwarz	ESH3-Z5	100191	May 09, 2025	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESCI	101414	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Pre-Amplifier	HP	8447F	2944A07999	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Bilog Antenna	Schwarzbeck	VULB9163	141	June 15, 2024	2 Year

3.3. For Harmonic Current / Flicker Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Impedance network	Teseq	INA2197/37A	1305A02873	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Impedance network	Teseq	INA 2196/75A	1305A02874	May 10, 2025	1 Year
<input type="checkbox"/>	Proflin 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 10, 2025	1 Year

3.4. For Electrostatic Discharge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	ESD Tester	TESEQ	NSG 438	1881	April 27, 2025	1 Year

3.5. For RF Strength Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Power Amplifier	MILMEGA	AS0102-55	1018770	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Log.-Per. Antenna	SCHWARZBECK	STLP 9129-7/16	3050	N/A	N/A
<input checked="" type="checkbox"/>	Signal Generator	Agilent	N5181A	MY50145187	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Field Strength Meter	DARE	RSS1006A	10I00037SNO 22	May 13, 2025	1 Year
<input checked="" type="checkbox"/>	Multi-function interface system	DARE	CTR1009B	12I00250SNO 72	N/A	N/A
<input checked="" type="checkbox"/>	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
<input checked="" type="checkbox"/>	Power Amplifier	MILMEGA	AS1860-50	1059346	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Power Amplifier	Vectawave	VBA 1000-600C	133627	Oct. 16, 2025	1 Year
<input checked="" type="checkbox"/>	Directional Coupler	BONN	BDC 0810-50/1500	2229689	Oct. 16, 2025	1 Year

3.6. For Electrical Fast Transient / Burst Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Burst Tester	Partner	IMU-MGS	109938-1635	Oct. 18, 2025	1 Year

3.7. For Surge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Controller	HAEFELY	Psurge 8000	174031	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Impulse Module	HAEFELY	PIM 100	174124	Aug. 08, 2025	1 Year
<input checked="" type="checkbox"/>	Coupling Decoupling	HAEFELY	PCD 130	172181	May 10, 2025	1 Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD122	174354	May 10, 2025	1 Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 120	174435	May 10, 2025	1 Year
<input type="checkbox"/>	Coupling Module	HAEFELY	PCD 126A	174387	Aug. 08, 2025	1 Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 110	174391	May 10, 2025	1 Year
<input type="checkbox"/>	Impulse Module	HAEFELY	PIM 150	178707	May 10, 2025	1 Year
<input type="checkbox"/>	Impulse Module	PMI	PCDN8	190422	Aug. 08, 2025	1 Year

3.8. For Injected Current Susceptibility Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Continuous Wave Simulator	EMTEST	CWS500C	0900-12	May 11, 2025	1 Year
<input checked="" type="checkbox"/>	CDN	EMTEST	CDN-M3	0900-11	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Attenuator	EMTEST	100W 6dB DC-3G	/	May 11, 2025	1 Year
<input checked="" type="checkbox"/>	Signal Generator	R&S	SMB100A	103041	May 09, 2025	1 Year
<input checked="" type="checkbox"/>	Power meter	AGILENT	E4418B	MY45102886	May 11, 2025	1 Year
<input checked="" type="checkbox"/>	Directional coupler	SKET	DC_0110000M-10 0W	SK201808030 1	May 11, 2025	1 Year

3.9. For Magnetic Field Immunity Test

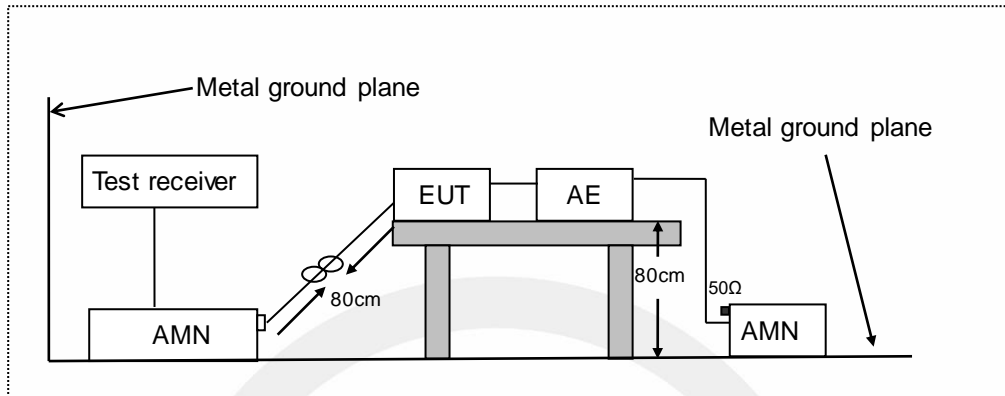
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 10, 2025	1 Year

3.10. For Voltage Dips and Interruptions Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<input checked="" type="checkbox"/>	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 10, 2025	1 Year
<input type="checkbox"/>	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 10, 2025	1 Year
<input type="checkbox"/>	Impedance network	Teseq	INA2197/37A	1305A02873	May 10, 2025	1 Year
<input type="checkbox"/>	Impedance network	Teseq	INA 2196/75A	1305A02874	May 10, 2025	1 Year
<input checked="" type="checkbox"/>	Proflin 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 10, 2025	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



AMN: Artificial Mains Network
 AE: Associated equipment
 EUT: Equipment under test

4.2. Measuring Standard

CISPR 11:2015+A1:2016+A2:2019

4.3. Power Line Conducted Emission Limits

Table 4 – Disturbance voltage limits for class B group 1 equipment measured on a test site (a.c. mains power port)

Frequency range MHz	Quasi-peak (dB μ V)	Average (dB μ V)
0,15 ~ 0,50	66 Decreasing linearly with logarithm of frequency to 56	56 Decreasing linearly with logarithm of frequency to 46
0,50 ~ 5	56	46
5 ~ 30	60	50
At the transition frequency, the more stringent limit shall apply.		

□Table 5 – Disturbance voltage limits for class B group 1 equipment measured on a test site (d.c. power port)

Frequency range MHz	Quasi-peak (dB μ V)	Average (dB μ V)
0,15 ~ 0,50	84 Decreasing linearly with logarithm of frequency to 74	74 Decreasing linearly with logarithm of frequency to 64
0,50 ~ 30	74	64

4.4. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN61326-1 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz and 200Hz in 9kHz~150kHz.

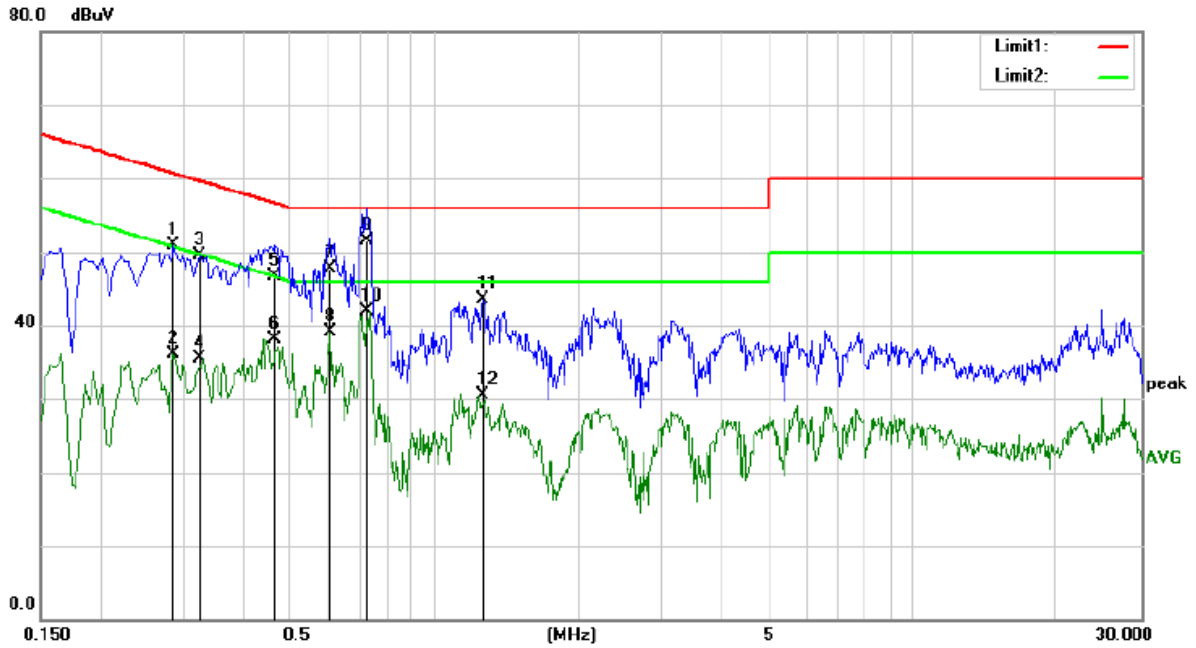
The frequency range from 150kHz to 30MHz is investigated

4.5. Measuring Results

PASS.

Please reference to the following pages.

Temperature	:	25.3°C
Humidity	:	45%
Atmospheric Pressure	:	101kpa
Test Engineer	:	Yang Huan
Test Date	:	2026-3-20



Site: Conduction 2#

Phase: **L1**

Temperature: 25.3

Limit: (CE)EN IEC 61326-1

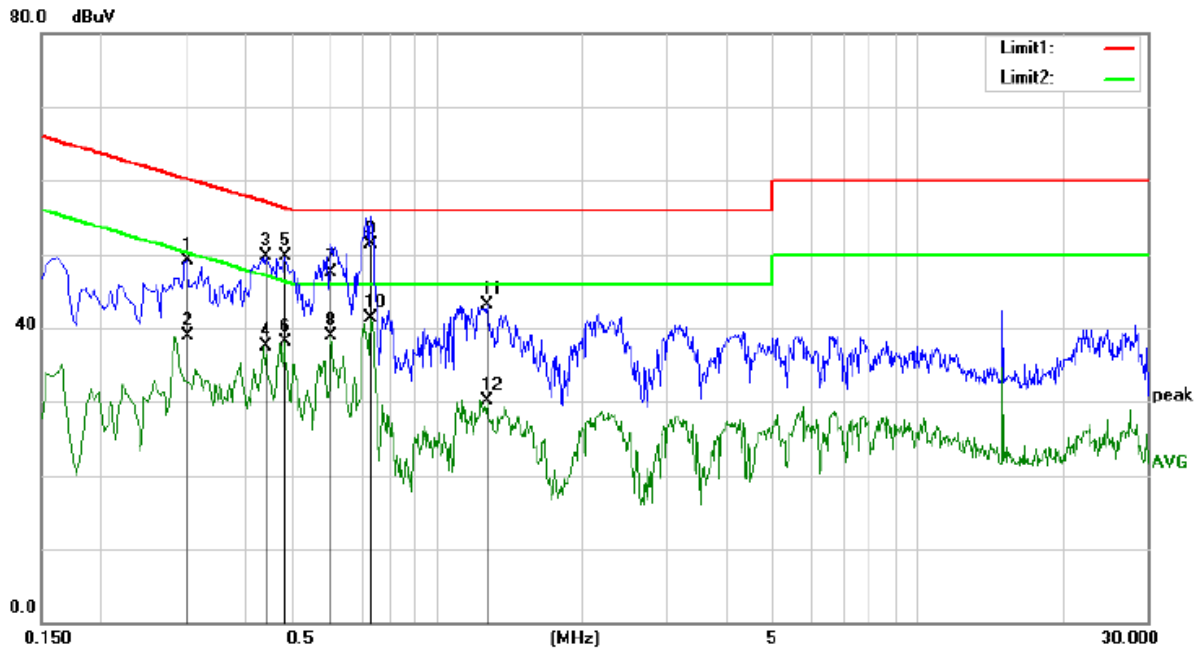
Power: AC 230V/50Hz

Humidity: 45 %

Mode: ON

Note: EUTMulti Circuit Multi-Functional Smart Meter

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2860	40.20	10.62	50.82	60.64	-9.82	QP	
2		0.2860	25.52	10.62	36.14	50.64	-14.50	AVG	
3		0.3220	38.87	10.62	49.49	59.66	-10.17	QP	
4		0.3220	24.85	10.62	35.47	49.66	-14.19	AVG	
5		0.4660	36.17	10.63	46.80	56.58	-9.78	QP	
6		0.4660	27.41	10.63	38.04	46.58	-8.54	AVG	
7		0.6060	37.15	10.65	47.80	56.00	-8.20	QP	
8		0.6060	28.40	10.65	39.05	46.00	-6.95	AVG	
9		0.7220	40.84	10.66	51.50	56.00	-4.50	QP	
10	*	0.7220	31.17	10.66	41.83	46.00	-4.17	AVG	
11		1.2660	32.78	10.71	43.49	56.00	-12.51	QP	
12		1.2660	19.78	10.71	30.49	46.00	-15.51	AVG	



Site Conduction 2#

Phase: **N**

Temperature: 25.3

Limit: (CE)EN IEC 61326-1

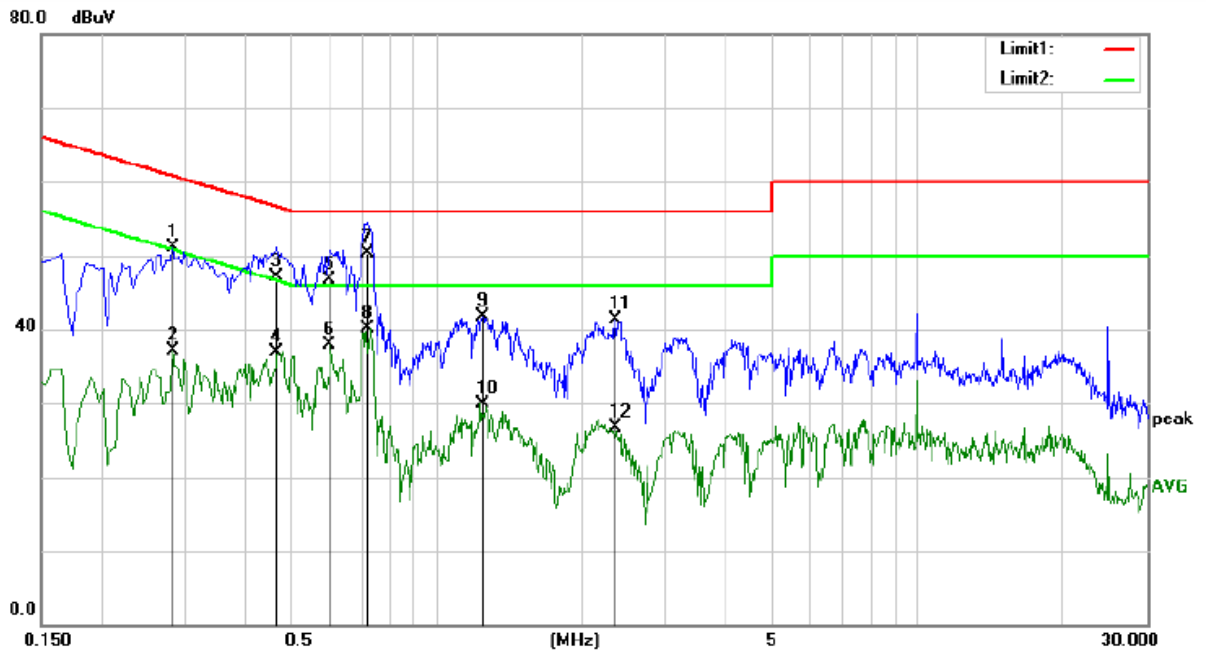
Power: AC 230V/50Hz

Humidity: 45 %

Mode: ON

Note: EUTMulti Crcuit Multi-Functional Smart Meter

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3020	38.57	10.62	49.19	60.19	-11.00	QP	
2		0.3020	28.31	10.62	38.93	50.19	-11.26	AVG	
3		0.4420	39.07	10.62	49.69	57.02	-7.33	QP	
4		0.4420	26.95	10.62	37.57	47.02	-9.45	AVG	
5		0.4820	39.06	10.63	49.69	56.30	-6.61	QP	
6		0.4820	27.48	10.63	38.11	46.30	-8.19	AVG	
7		0.6020	36.85	10.65	47.50	56.00	-8.50	QP	
8		0.6020	28.32	10.65	38.97	46.00	-7.03	AVG	
9		0.7300	40.64	10.66	51.30	56.00	-4.70	QP	
10	*	0.7300	30.68	10.66	41.34	46.00	-4.66	AVG	
11		1.2740	32.34	10.71	43.05	56.00	-12.95	QP	
12		1.2740	19.49	10.71	30.20	46.00	-15.80	AVG	



Site Conduction 2#

Phase: **L1**

Temperature: 25.3

Limit: (CE)EN IEC 61326-1

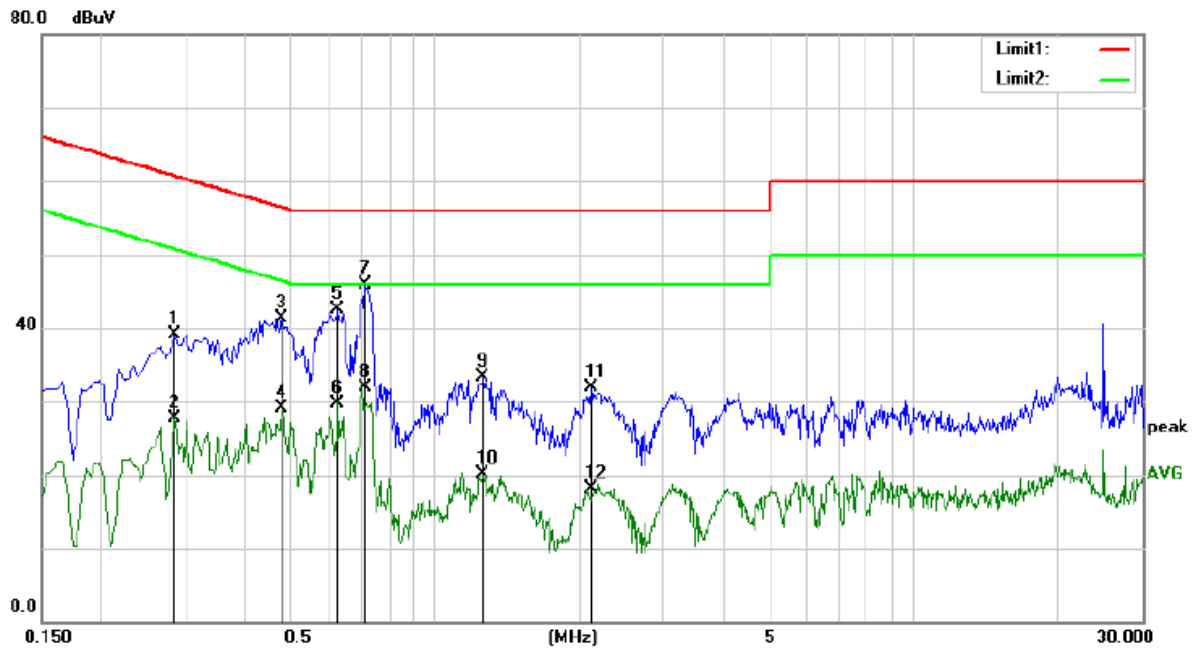
Power: AC 400V/50Hz

Humidity: 45 %

Mode: ON

Note: EUTMulti Crcuit Multi-Functional Smart Meter

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2820	40.40	10.62	51.02	60.76	-9.74	QP	
2		0.2820	26.49	10.62	37.11	50.76	-13.65	AVG	
3		0.4660	36.57	10.63	47.20	56.58	-9.38	QP	
4		0.4660	26.36	10.63	36.99	46.58	-9.59	AVG	
5		0.5980	36.15	10.65	46.80	56.00	-9.20	QP	
6		0.5980	27.35	10.65	38.00	46.00	-8.00	AVG	
7	*	0.7180	39.64	10.66	50.30	56.00	-5.70	QP	
8		0.7180	29.41	10.66	40.07	46.00	-5.93	AVG	
9		1.2460	30.96	10.70	41.66	56.00	-14.34	QP	
10		1.2460	19.16	10.70	29.86	46.00	-16.14	AVG	
11		2.3500	30.60	10.77	41.37	56.00	-14.63	QP	
12		2.3500	15.86	10.77	26.63	46.00	-19.37	AVG	



Site Conduction 2#

Phase: **L2**

Temperature: 25.3

Limit: (CE)EN IEC 61326-1

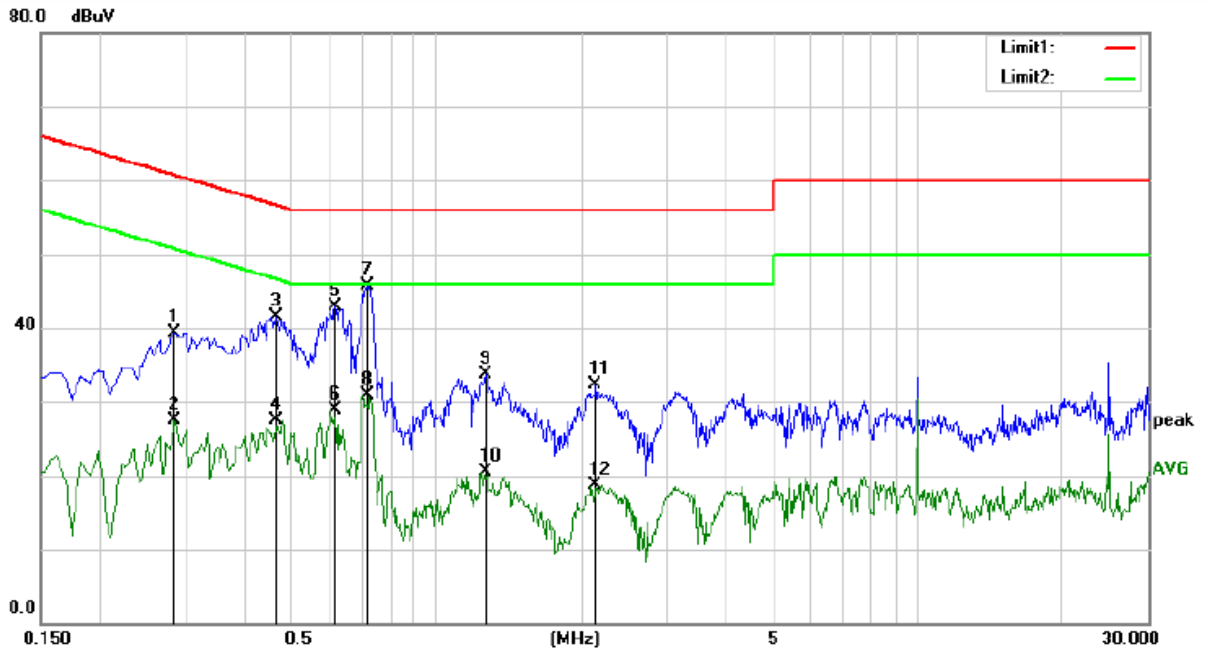
Power: AC 400V/50Hz

Humidity: 45 %

Mode: ON

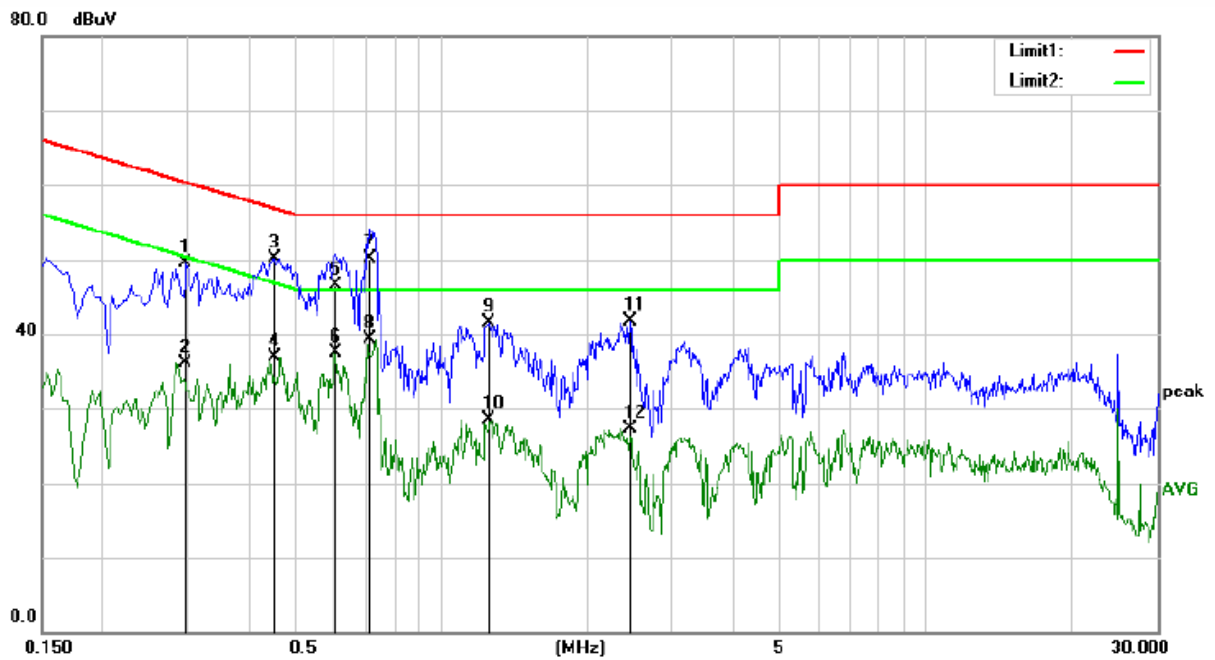
Note: EUTMulti Crcuit Multi-Functional Smart Meter

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2860	28.49	10.62	39.11	60.64	-21.53	QP	
2		0.2860	17.02	10.62	27.64	50.64	-23.00	AVG	
3		0.4780	30.71	10.63	41.34	56.37	-15.03	QP	
4		0.4780	18.48	10.63	29.11	46.37	-17.26	AVG	
5		0.6260	31.85	10.65	42.50	56.00	-13.50	QP	
6		0.6260	19.15	10.65	29.80	46.00	-16.20	AVG	
7	*	0.7140	35.22	10.66	45.88	56.00	-10.12	QP	
8		0.7140	21.25	10.66	31.91	46.00	-14.09	AVG	
9		1.2620	22.56	10.71	33.27	56.00	-22.73	QP	
10		1.2620	9.40	10.71	20.11	46.00	-25.89	AVG	
11		2.1140	21.10	10.73	31.83	56.00	-24.17	QP	
12		2.1140	7.45	10.73	18.18	46.00	-27.82	AVG	



Site: Conduction 2# Phase: **L3** Temperature: 25.3
 Limit: (CE)EN IEC 61326-1 Power: AC 400V/50Hz Humidity: 45 %
 Mode: ON
 Note: EUTMulti Crcuit Multi-Functional Smart Meter

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2860	28.62	10.62	39.24	60.64	-21.40	QP	
2		0.2860	16.84	10.62	27.46	50.64	-23.18	AVG	
3		0.4660	30.92	10.63	41.55	56.58	-15.03	QP	
4		0.4660	16.83	10.63	27.46	46.58	-19.12	AVG	
5		0.6140	32.20	10.65	42.85	56.00	-13.15	QP	
6		0.6140	18.20	10.65	28.85	46.00	-17.15	AVG	
7	*	0.7180	35.14	10.66	45.80	56.00	-10.20	QP	
8		0.7180	20.25	10.66	30.91	46.00	-15.09	AVG	
9		1.2660	22.97	10.71	33.68	56.00	-22.32	QP	
10		1.2660	9.70	10.71	20.41	46.00	-25.59	AVG	
11		2.1420	21.62	10.74	32.36	56.00	-23.64	QP	
12		2.1420	7.94	10.74	18.68	46.00	-27.32	AVG	



Site Conduction 2#

Phase: **N**

Temperature: 25.3

Limit: (CE)EN IEC 61326-1

Power: AC 400V/50Hz

Humidity: 45 %

Mode: ON

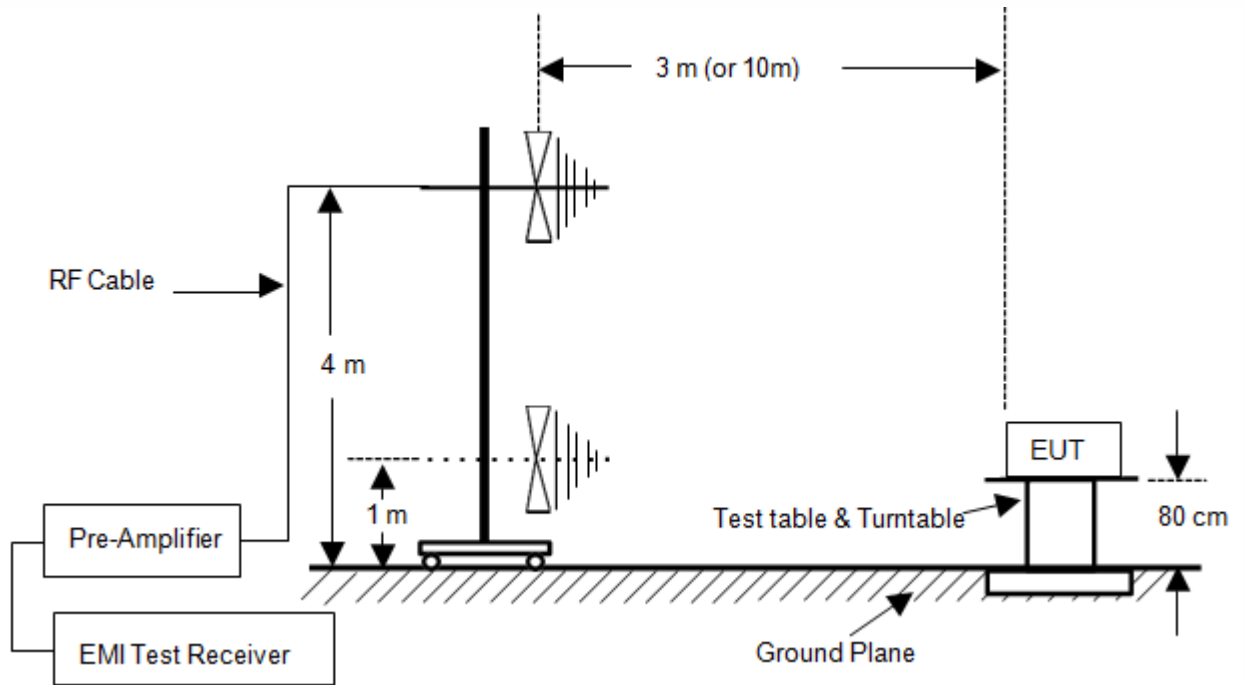
Note: EUTMulti Crcuit Multi-Functional Smart Meter

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2980	38.80	10.62	49.42	60.30	-10.88	QP	
2		0.2980	25.44	10.62	36.06	50.30	-14.24	AVG	
3		0.4540	39.48	10.63	50.11	56.80	-6.69	QP	
4		0.4540	26.36	10.63	36.99	46.80	-9.81	AVG	
5		0.6060	35.85	10.65	46.50	56.00	-9.50	QP	
6		0.6060	26.78	10.65	37.43	46.00	-8.57	AVG	
7	*	0.7140	39.44	10.66	50.10	56.00	-5.90	QP	
8		0.7140	28.58	10.66	39.24	46.00	-6.76	AVG	
9		1.2500	30.90	10.70	41.60	56.00	-14.40	QP	
10		1.2500	17.89	10.70	28.59	46.00	-17.41	AVG	
11		2.4580	30.89	10.78	41.67	56.00	-14.33	QP	
12		2.4580	16.45	10.78	27.23	46.00	-18.77	AVG	

5. RADIATED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of test setup (In chamber)



5.2. Measuring Standard

CISPR 11:2015+A1:2016+A2:2019

5.3. Radiated Emission Limits (Group 1, Class B)

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

- Note:
- (1) The smaller limit shall apply at the combination point between two frequency bands.
 - (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4. Test Procedure

The EUT is placed on a turntable which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

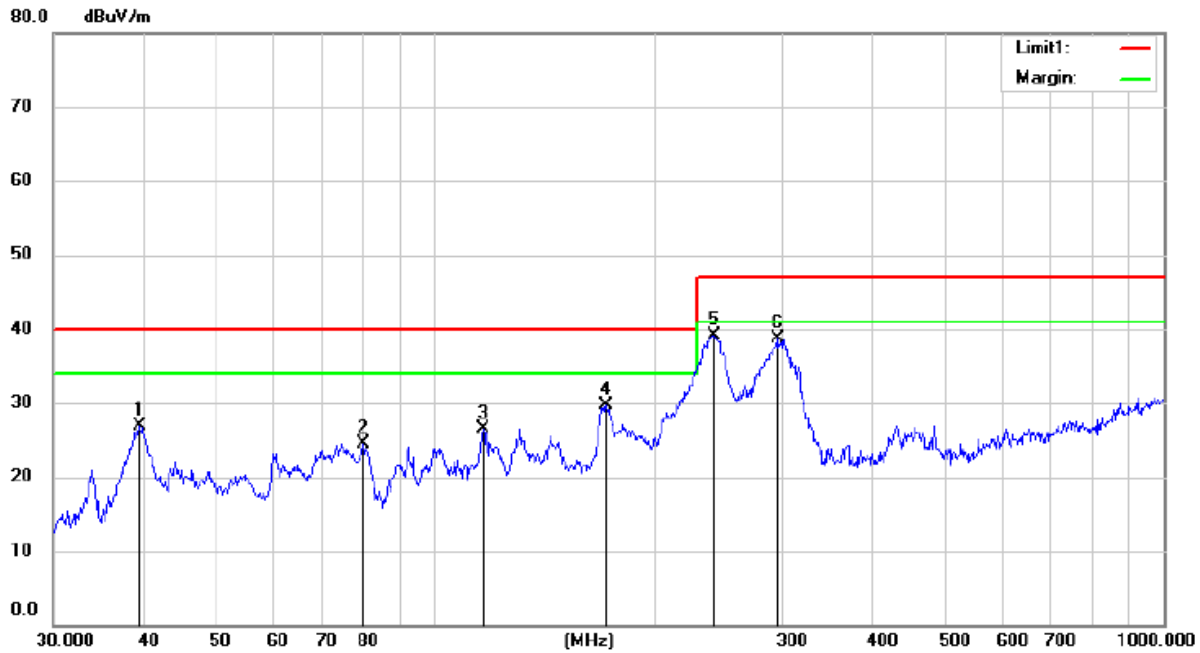
5.5. Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

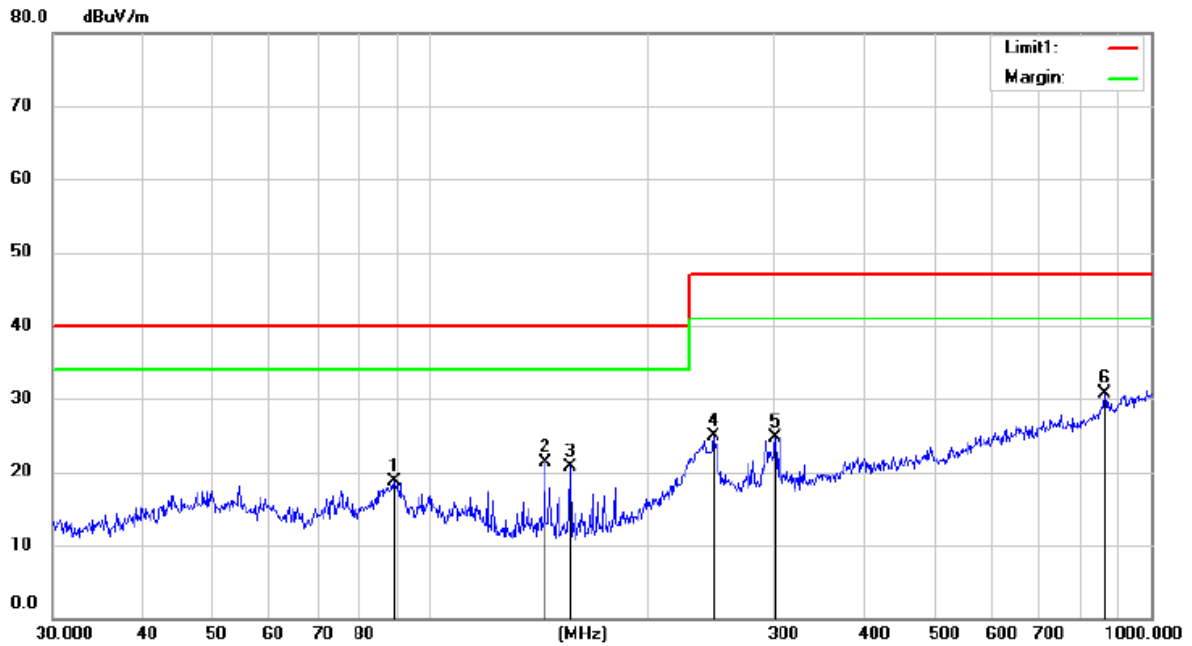
All the modes were tested and the data of the worst modes are attached the following pages.

Temperature	:	26.5°C
Humidity	:	58%
Atmospheric Pressure	:	101kpa
Test Engineer	:	Huang Junjie
Test Date	:	2025-11-13



Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 26.5 C
 Limit: CISPR11 Group 1 ClassB Power: AC 230V/50Hz Humidity: 58 %
 Mode: ON
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		39.4371	39.72	-12.89	26.83	40.00	-13.17	QP			
2		79.8003	40.84	-16.30	24.54	40.00	-15.46	QP			
3		116.5401	39.90	-13.45	26.45	40.00	-13.55	QP			
4		171.9946	43.94	-14.33	29.61	40.00	-10.39	QP			
5	*	241.6763	49.73	-10.61	39.12	47.00	-7.88	QP			
6		295.1470	47.71	-8.99	38.72	47.00	-8.28	QP			



Site 3m Chamber #1

Polarization: *Horizontal*

Temperature: 26.5 C

Limit: CISPR11 Group 1 ClassB

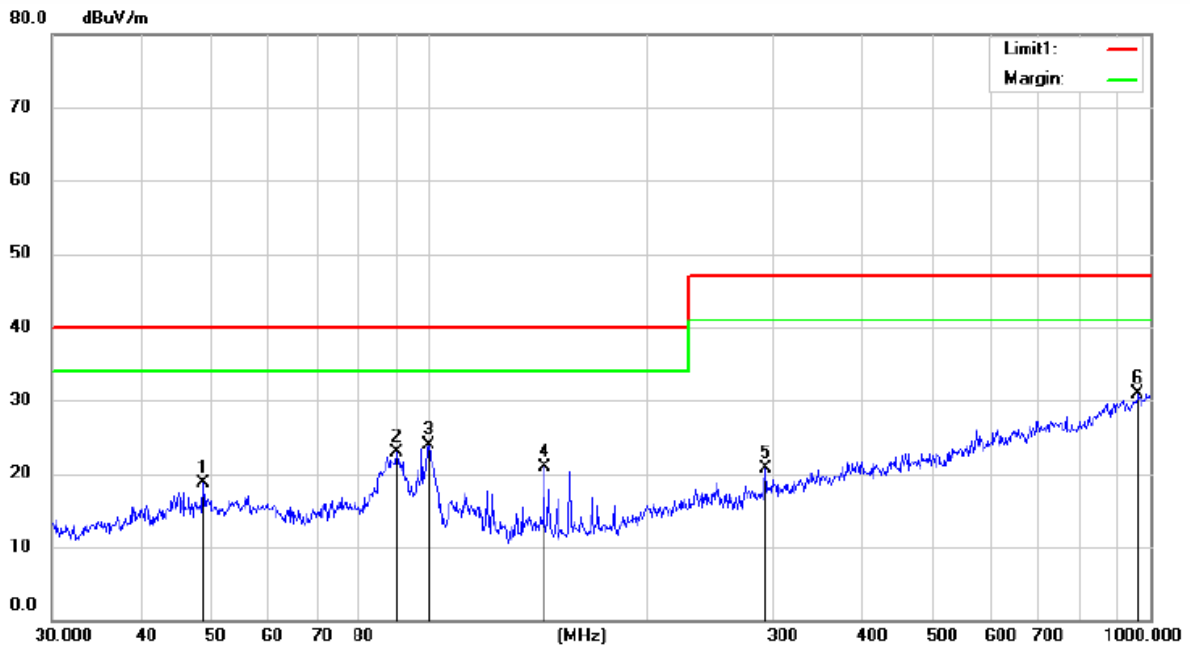
Power: AC 400V/50Hz

Humidity: 58 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		89.2762	33.26	-14.51	18.75	40.00	-21.25			QP
2		144.3347	36.41	-15.02	21.39	40.00	-18.61			QP
3		156.4577	35.81	-15.06	20.75	40.00	-19.25			QP
4		247.6818	35.09	-10.24	24.85	47.00	-22.15			QP
5		301.4223	33.09	-8.44	24.65	47.00	-22.35			QP
6	*	863.0562	30.15	0.53	30.68	47.00	-16.32			QP

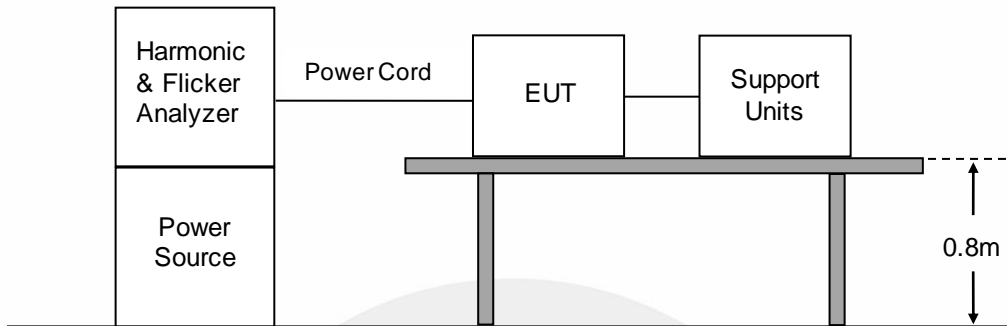


Site 3m Chamber #1 Polarization: **Vertical** Temperature: 26.5 C
 Limit: CISPR11 Group 1 ClassB Power: AC 400V/50Hz Humidity: 58 %
 Mode: ON
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		48.6720	29.52	-10.87	18.65	40.00	-21.35	QP		
2		90.2205	37.26	-14.37	22.89	40.00	-17.11	QP		
3		99.8777	36.56	-12.64	23.92	40.00	-16.08	QP		
4		144.3348	35.85	-15.02	20.83	40.00	-19.17	QP		
5		293.0842	29.85	-9.18	20.67	47.00	-26.33	QP		
6	*	962.1623	29.59	1.39	30.98	47.00	-16.02	QP		

6. HARMONIC CURRENT EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Standard Limits

EN IEC 61000-3-2, CLASS A

Harmonic current emissions evaluate the potential for the EUT to cause distortion on the AC power lines. It is applicable to electrical and electronic equipment having an input current ≤ 16 A per phase, and intended to be connected to public low-voltage distribution systems

Table 1 - Limits for Class A equipment

Harmonic order n	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \frac{0.15}{n}$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \frac{8}{n}$

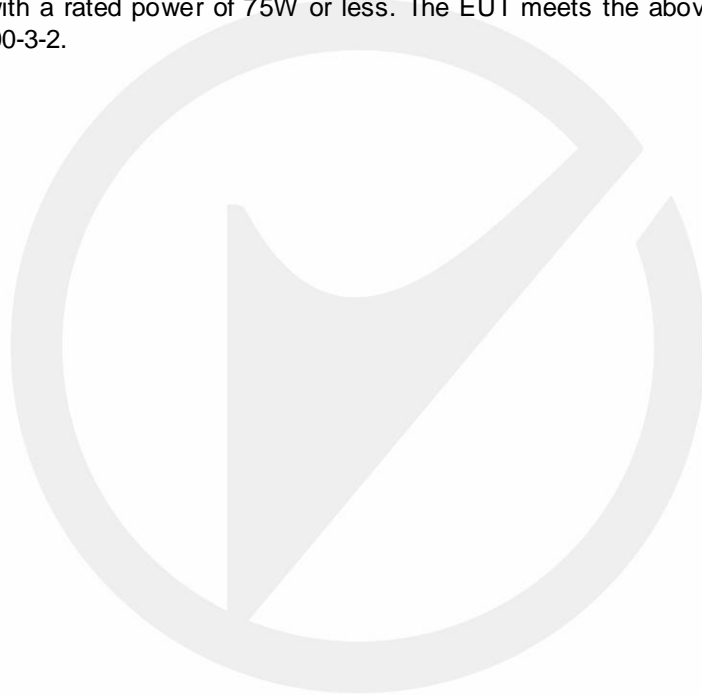
6.3. Test Procedure

The measurement of harmonic currents shall be performed as follows: i. For each harmonic order, measure the 1.5 s smoothed r.m.s. harmonic current in each DFT time window as defined in EN / IEC 61000-4-7:2009. ii. Calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period Short cyclic ($T_{\text{cycle}} \leq 2.5 \text{ min}$). Because of synchronisation to meet the requirements for repeatability in 5%.

6.4. Test Results

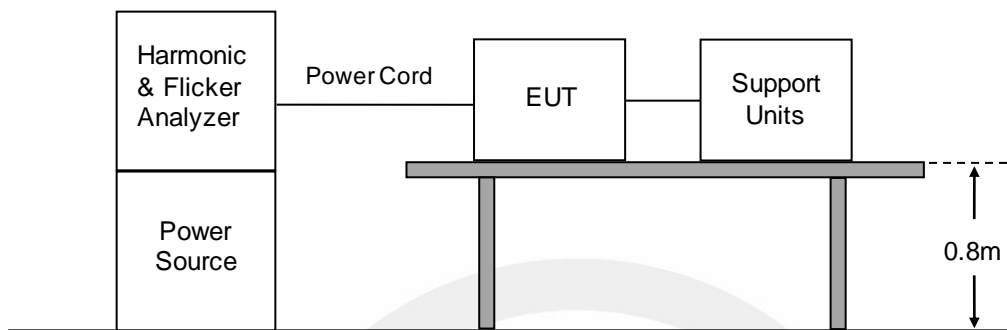
N/A.

As specified on section 7 and above figure of EN IEC 61000-3-2, the limits are not specified for equipment with a rated power of 75W or less. The EUT meets the above condition, so it conforms to EN IEC 61000-3-2.



7. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Standard Limits

EN 61000-3-3 Limits

The objective of voltage changes, voltage fluctuations and flicker in public low voltage supply systems during equipment with rated current ≤ 16 A per phase, ensures that home appliances and certain other electrical equipment do not adversely affect lighting equipment when connected to the same power system.

Voltage Fluctuation and Flicker Limits:

- the value of Pst shall not be greater than 1.0;
- the value of Plt shall not be 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, dmax, shall not exceed 4.0 %;

7.3. Test Procedure

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of 8% is achieved during the whole assessment procedure.

7.4. Test Results

PASS.

Please see the attached page.

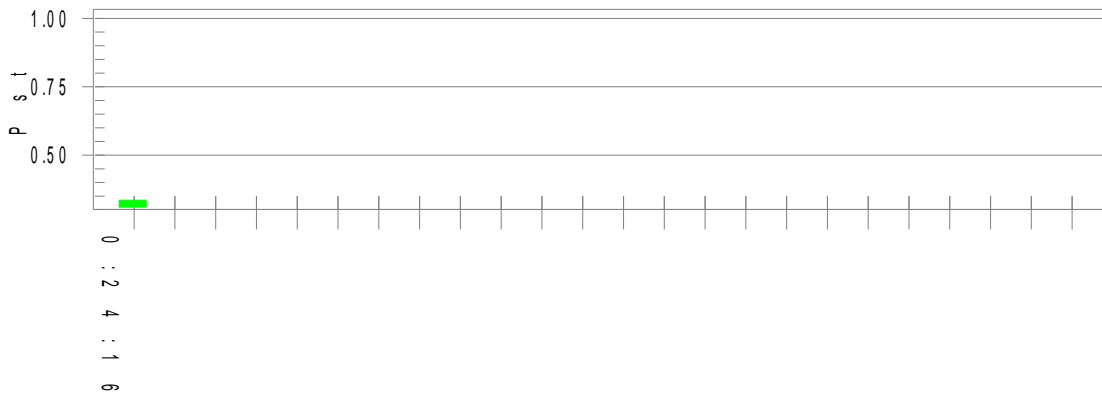
Flicker Test Summary per EN/IEC61000-3-3 (Phase A-Run time)

EUT: Multi Circuit Multi-Functional Smart Meter Tested by: xingjin lu
 Test category: All parameters (European limits) Test Margin: 100
 Test date: 2025/11/11 Start time: 0:13:53 End time: 0:24:22
 Test duration (min): 10 Data file name: CTSMXL_F-001819.cts_data
 Comment: ON
 Customer: Shanghai Matis Electric Co.Ltd

Test Result: Pass Status: Test Completed

Pst_i and limit line

European Limits



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.65			
T-max (mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.05	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.335	Test limit:	1.000	Pass

Flicker Test Summary per EN/IEC61000-3-3 (Phase C-Run time)

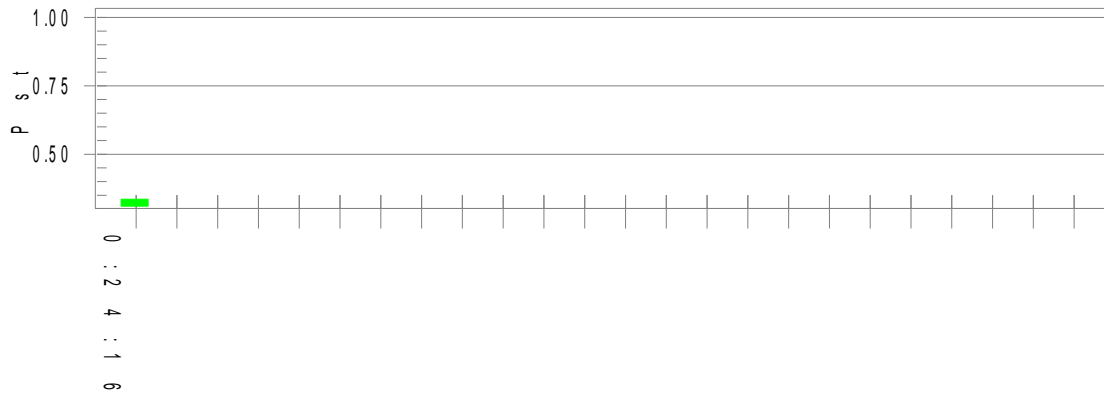
EUT: Multi Circuit Multi-Functional Smart Meter
Test category: All parameters (European limits)
Test date: 2025/11/11 **Start time:** 0:13:53
Test duration (min): 10 **Data file name:** CTSMXL_F-001819.cts_data
Comment: ON
Customer: Shanghai Matis Electric Co.Ltd

Tested by: xingjin lu
Test Margin: 100
End time: 0:24:22

Test Result: Pass **Status:** Test Completed

Pstj and limit line

European Limits



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.44			
Tmax(mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.06	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.335	Test limit:	1.000	Pass

8. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

Criterion 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.

Criterion B:

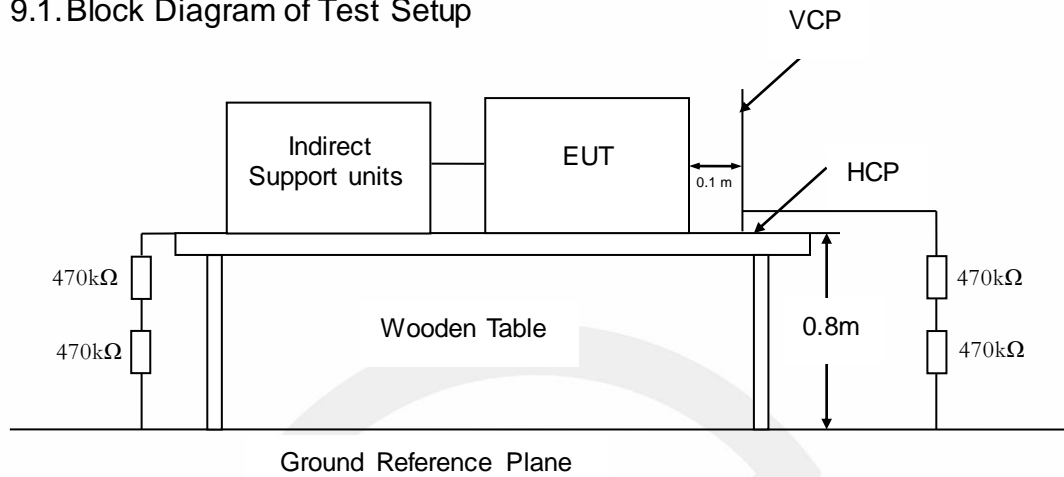
The equipment shall continue to operate as intended after the test. No DEGRADATION OF PERFORMANCE or LOSS OF FUNCTION is allowed below a PERFORMANCE LEVEL specified in the user documentation, when the equipment is used as intended. During the test, the equipment PERFORMANCE LEVEL may be replaced by a 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.

Criterion 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.

9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1. Block Diagram of Test Setup



9.2. Test Standard

EN IEC 61326-1:2021

(IEC 61000-4-2:2008 Severity Level: 2/Contact Discharge: $\pm 4\text{kV}$
Level: 3/Air Discharge: $\pm 8\text{kV}$)

9.3. Severity Levels and Performance Criterion

9.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	± 2	± 2
2	± 4	± 4
3	± 6	± 8
4	± 8	± 15
x	Special	Special

9.3.2. Performance criterion: B

9.4. Test Procedure

9.4.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.4.2. Contact Discharge:

All the procedure shall be same as Section 9.4.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.4.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

9.4.4. Indirect discharge for vertical coupling plane

At least 10 singles discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.5. Test Results

PASS.

Please refer to the following page.

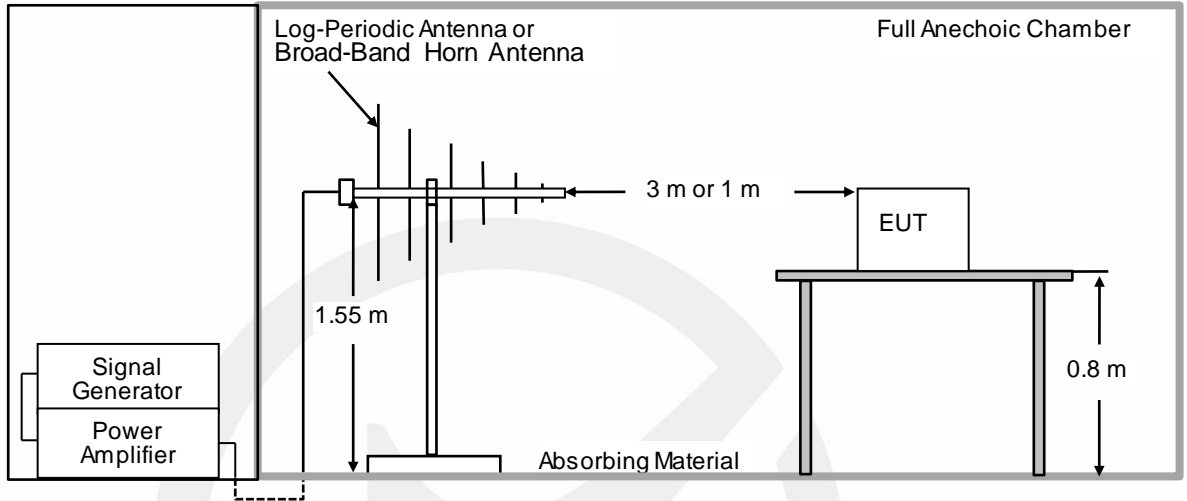
Electrostatic Discharge Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.		
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11
M/N:	MPM4410-A	Temperature:	23.6°C
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	45%
Test Engineer:	Lu Xingjin	Test Mode:	On
Air discharge:	±8.0kV	Criterion:	B
Contact discharge:	±4.0kV		
Location	Kind A-Air Discharge C-Contact Discharge	Result	
BUTTON/SLOT/SCREEN	A	A	
HCP	C	A	
VCP of front	C	A	
VCP of rear	C	A	
VCP of left	C	A	
VCP of right	C	A	
Note: Normal performance during testing.			

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1. Block Diagram of Test Setup



10.2. Test Standard

EN IEC 61326-1:2021 (IEC 61000-4-3:2006+A1:2007+A2:2010, Severity Level 3: 10V/m
Severity Level 2: 3V/m)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity Levels

Level	Field Strength V/m
1	1
2	3
3	10
X	Special

10.3.2. Performance Criterion: A

10.4. Test Procedure

The EUT are placed on a table that is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna that is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor it. All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	10V/m (80MHz to 1.0GHz) 3V/m (1400MHz to 6.0GHz)
2. Radiated Signal	Modulated
3. Scanning Frequency	80-6000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

10.5. Test Results

PASS.

Please refer to the following pages.

RF Field Strength Susceptibility Test Results

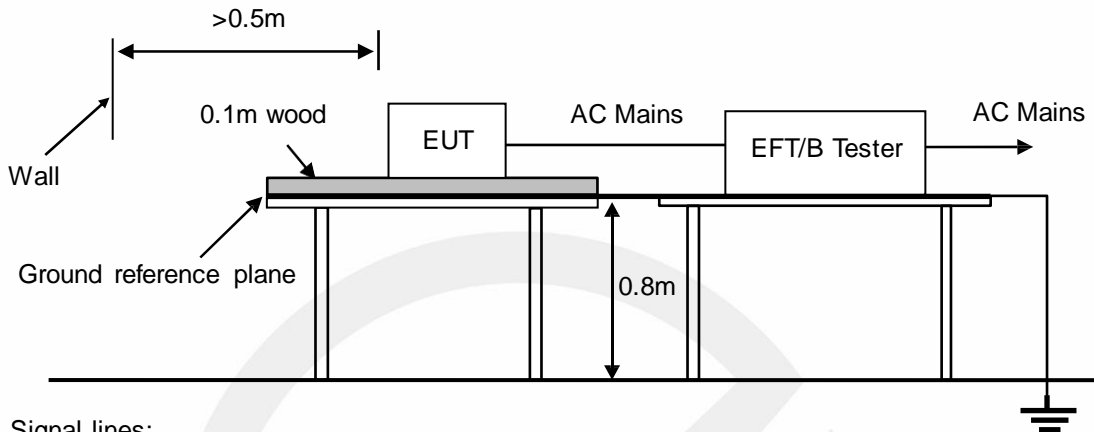
EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.			
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11	
M/N:	MPM4410-A	Temperature:	22.4℃	
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	50%	
Test Engineer:	Lu Xingjin	Test Mode:	On	
Field Strength:	10 V/m, 3V/m	Frequency Range:	80 MHz to 1000 MHz 14000 MHz to 6000 MHz	
Modulation:	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1kHz 80%	Steps:	1%	
Criterion:	A			
	Frequency Rang: 80~1000 MHz (10V/m)		Frequency Rang: 1400~6000 MHz (3V/m)	
	Horizontal	Vertical	Horizontal	Vertical
Front	A	A	A	A
Right	A	A	A	A
Rear	A	A	A	A
Left	A	A	A	A
Note: Normal performance during testing.				

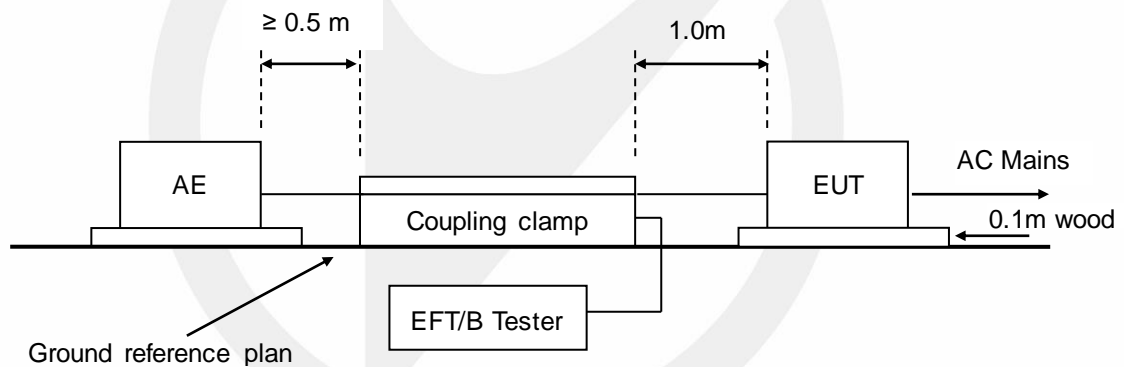
11. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

11.1. Block Diagram of Test Setup

AC/DC Lines:



Signal lines:



11.2. Test Standard

EN IEC 61326-1:2021

(IEC61000-4-4:2012, Severity Level: 3: 2kV for AC Mains)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Level	Open Circuit Output Test Voltage $\pm 10\%$	
	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

11.3.2. Performance criterion: B

11.4. Test Procedure

The EUT is put on the table that is 0.8meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

11.5. Test Results

PASS.

Please refer to the following page.



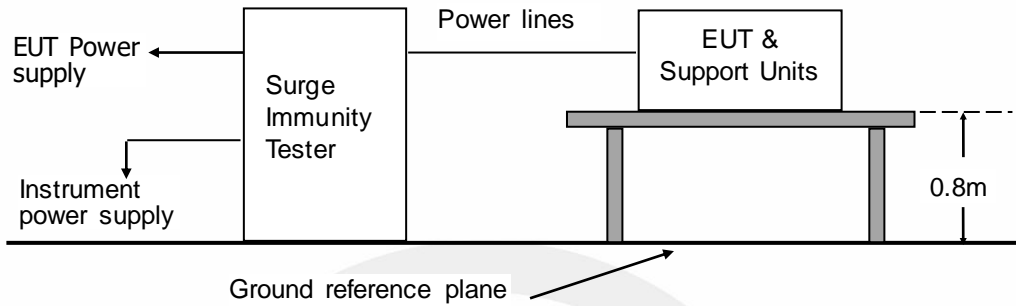
Electrical Fast Transient/Burst Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.		
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11
M/N:	MPM4410-A	Temperature:	23.9℃
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	52%
Test Engineer:	Lu Xingjin	Test Mode:	On
Test Time:	120s	Criterion:	B
Line:	<input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains	Line:	<input type="checkbox"/> Signal <input type="checkbox"/> I/O Cable
Coupling:	<input checked="" type="checkbox"/> Direct	Coupling:	<input type="checkbox"/> Capacitive
Line	Test Voltage	Result(+)	Result(-)
L1	2kV	A	A
L2	2kV	A	A
L3	2kV	A	A
N	2kV	A	A
L1、L2、L3、N	2kV	A	A
Note: Normal performance during testing.			

12. SURGE IMMUNITY TEST

12.1. Block Diagram of Test Setup



12.2. Test Standard

EN IEC 61326-1:2021

(IEC 61000-4-5:2014+A1:2017, Severity Level: Line to Line: Level 2, 1kV;
Line to Earth: Level 3, 2kV, Signal Line: Level 2, 1kV)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.3.2. Performance criterion: B

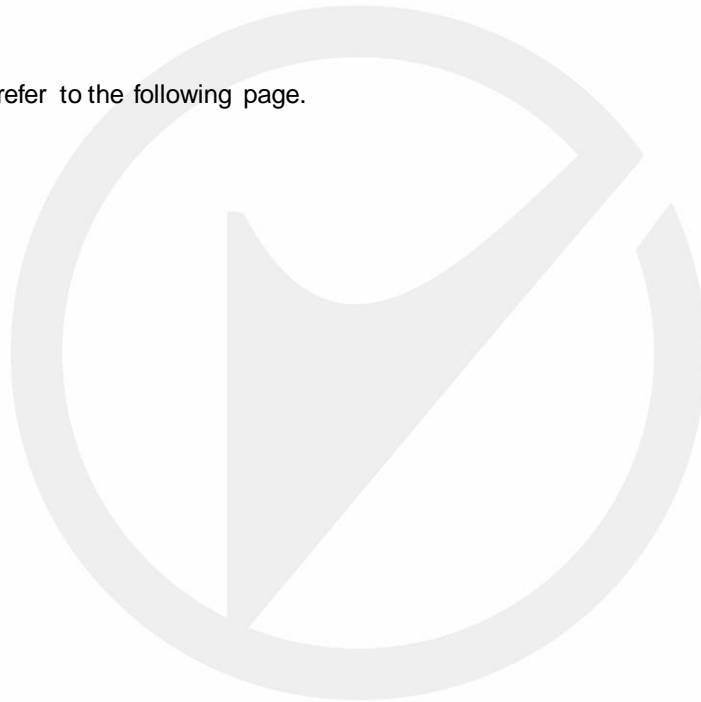
12.4. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 12.1.
- 2) For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge
For line to earth coupling mode, provide a 2.0 kV 1.2/50us voltage surge
(At open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.5. Test Results

PASS.

Please refer to the following page.



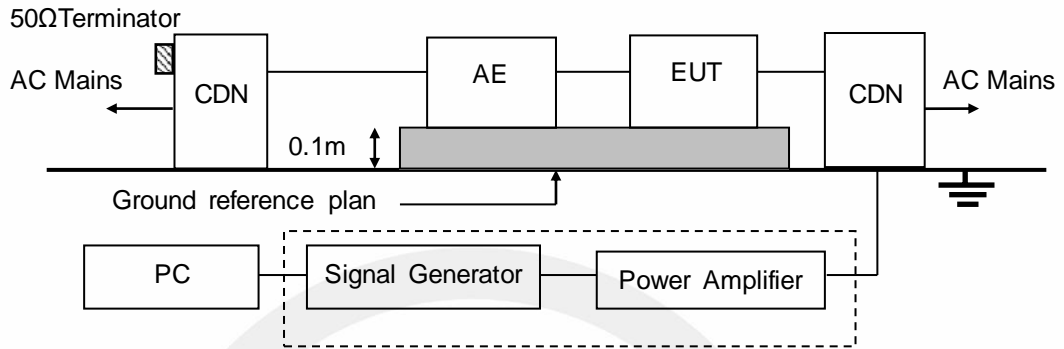
Surge Immunity Test Result

EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.				
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11		
M/N:	MPM4410-A	Temperature:	23.9℃		
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	52%		
Test Engineer:	Lu Xingjin	Test Mode:	On		
Criterion:	B				
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	±	0° , 90° , 180° , 270°	5	1	A
Note: Normal performance during testing.					

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1. Block Diagram of Test Setup



13.2. Test Standard

EN IEC 61326-1:2021
(IEC 61000-4-6:2013, Severity Level: Level 2, 3V (r.m.s.))

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

Level	Field Strength V
1	1
2	3
3	10
X	Special

13.3.2. Performance criterion: A

13.4. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 13.1.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from PC. Cables between CDN and PC are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to PC through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.5. Test Results

PASS.

Please refer to the following page.

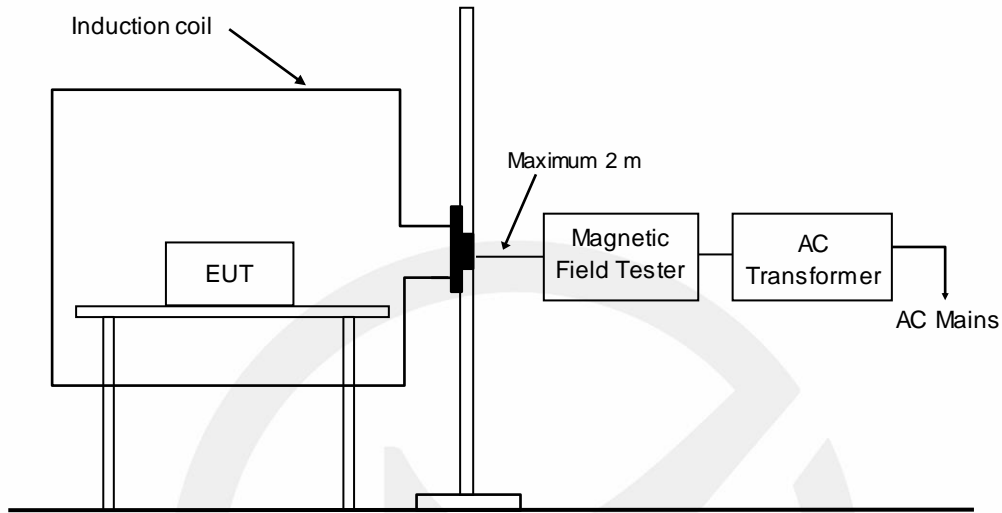
Injected Currents Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.			
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11	
M/N:	MPM4410-A	Temperature:	23.9℃	
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	52%	
Test Engineer:	Lu Xingjin	Test Mode:	On	
Modulation:	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1kHz 80%	Steps:	1%	
Criterion:	A			
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 80	AC Mains	3V	A	A
Note: Normal performance during testing.				

14. MAGNETIC FIELD SUSCEPTIBILITY TEST

14.1. Block Diagram of Test Setup



EUT: Equipment under test

14.2. Test Standard

EN IEC 61326-1:2021
(IEC 61000-4-8:2009, Severity Level: Level 4, 30A/m)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity Levels

Level	Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

14.3.2. Performance Criterion: A

14.4. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

14.5. Test Results

PASS.

Please refer to the following page.



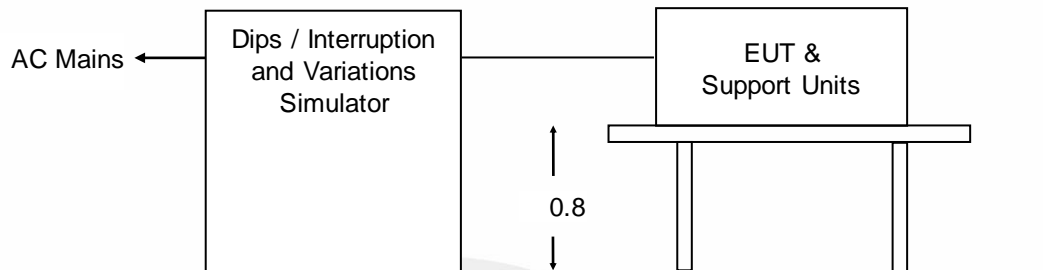
Magnetic Field Immunity Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant:	Shanghai Matis Electric Co.Ltd.			
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11	
M/N:	MPM4410-A	Temperature:	23.9°C	
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	52%	
Test Engineer:	Lu Xingjin	Test Mode:	On	
Criterion:	A			
Test Level (A/m)	Testing Duration	Coil Orientation	Criterion	Result
30	5 mins	X	A	A
30	5 mins	Y	A	A
30	5 mins	Z	A	A
Note: Normal performance during testing.				

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

15.1. Block Diagram of Test Setup



15.2. Test Standard

EN IEC 61326-1:2021 (IEC 61000-4-11:2020)

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
40	60	1
70	30	5
0	100	10
		25
		50
		*

15.3.2. Performance criterion: B&C

15.4. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 15.1.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

15.5. Test Results

PASS.

Please refer to the following page.

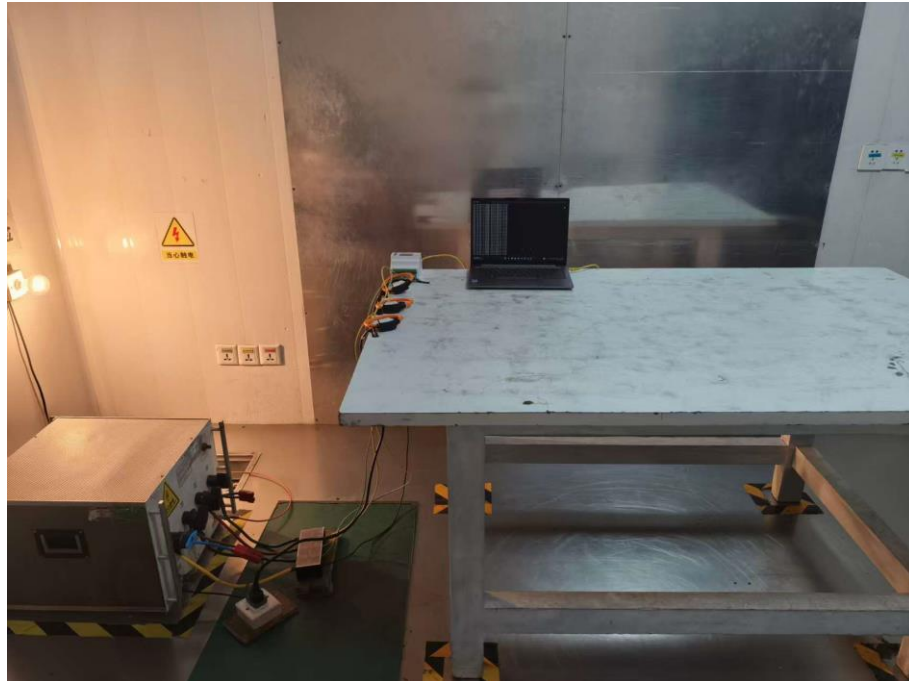
Voltage Dips and Interruptions Test Results

EMTEK (SHENZHEN) CO., LTD.

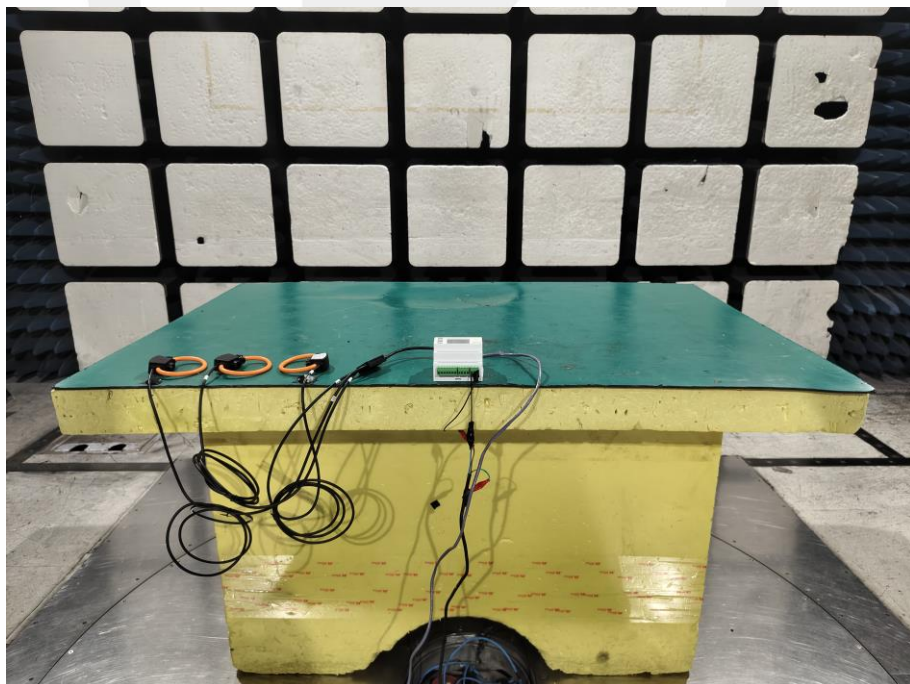
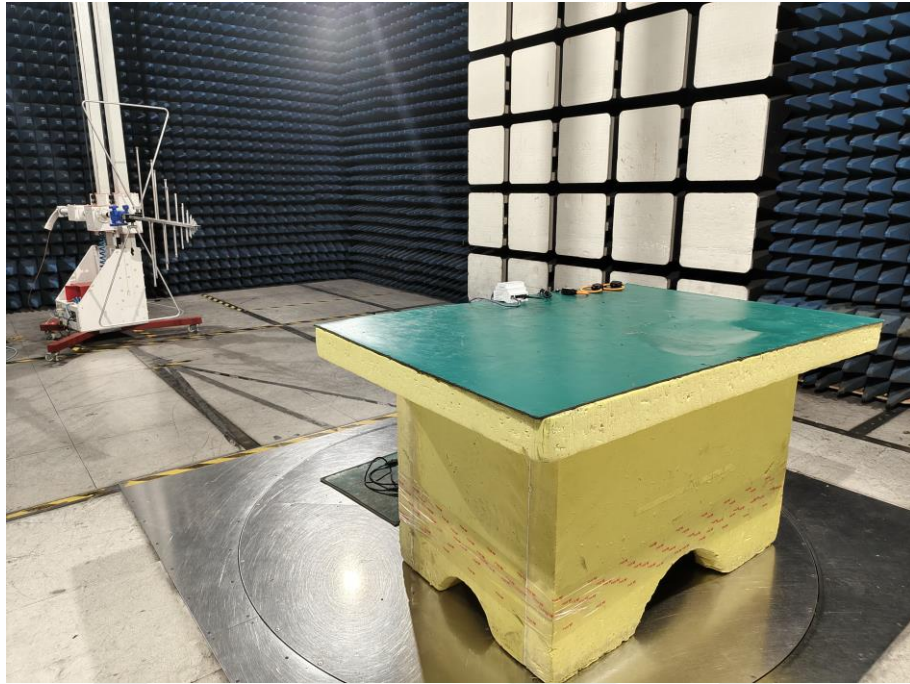
Applicant:	Shanghai Matis Electric Co.Ltd.			
EUT:	Multi Circuit Multi-Functional Smart Meter	Test Date:	2025-11-11	
M/N:	MPM4410-A	Temperature:	23.9℃	
Test Voltage:	AC 230V/50Hz, AC 400V/50Hz	Humidity:	52%	
Test Engineer:	Lu Xingjin	Test Mode:	On	
Criterion:	B/C			
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	Result
0	100	1P	B	A
40	70	10P	C	A
70	30	25P	C	A
0	100	250P	C	B
<p>Note: When it drops to 0% 250P, the prototype stops charging and automatically recovers after the test is completed.</p>				

16. PHOTOGRAPHS

16.1. Photos of Conducted Emission Measurement



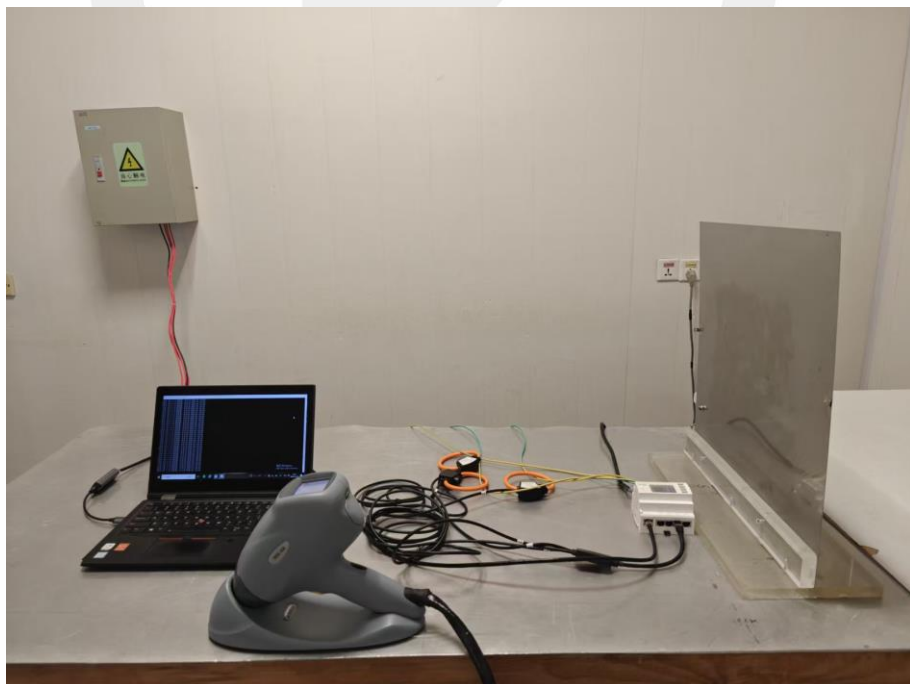
16.2.Photos of Radiation Emission Measurement



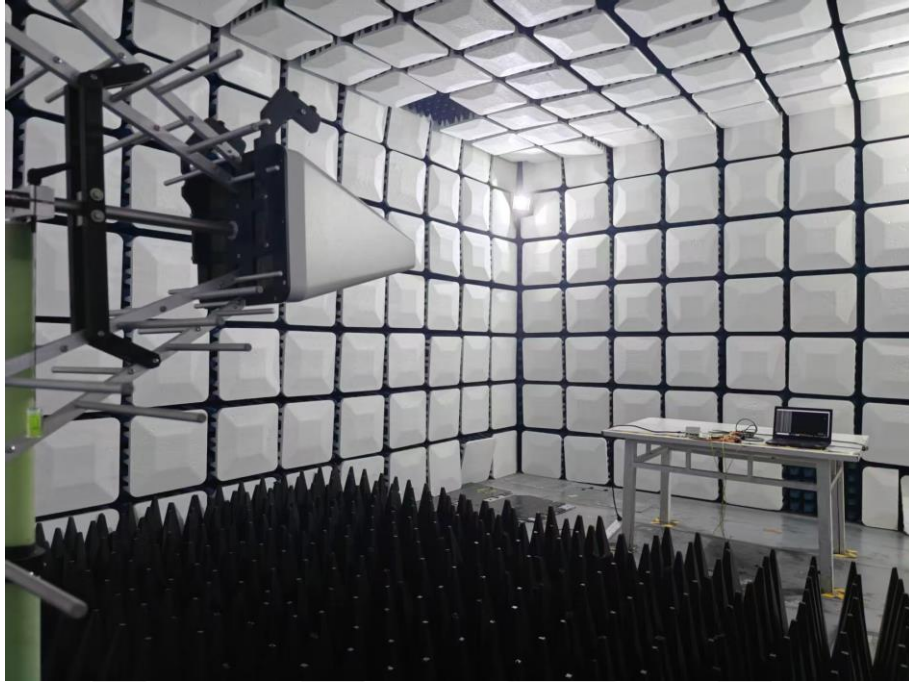
16.3.Photo of Harmonic / Flicker Measurement



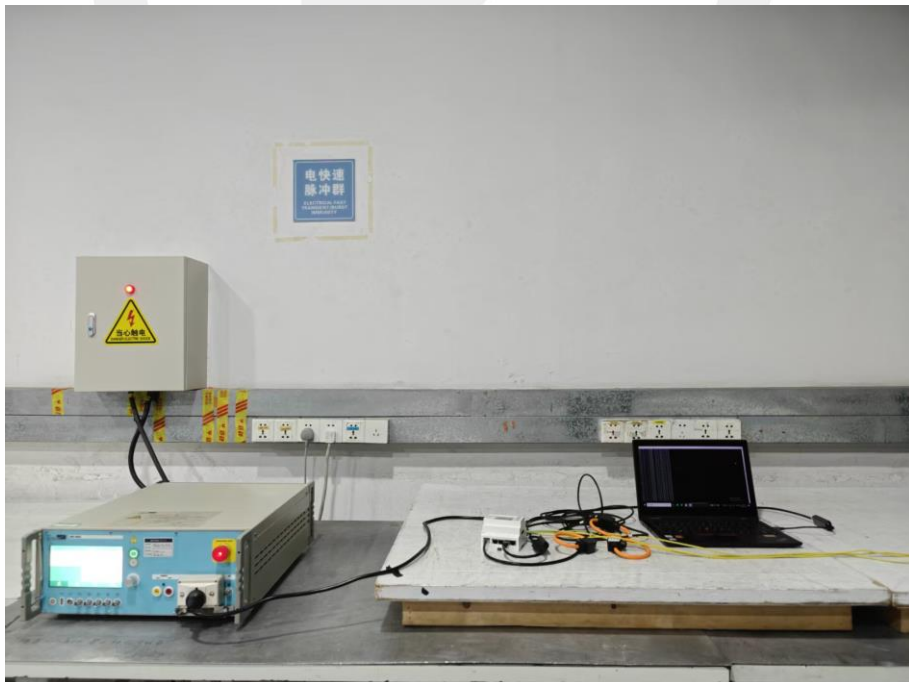
16.4.Photo of Electrostatic Discharge Test



16.5.Photos of RF Field Strength Susceptibility Test



16.6.Photo of Electrical Fast Transient / Burst Test



16.7.Photo of Surge Test



16.8.Photo of Injected Currents Susceptibility Test



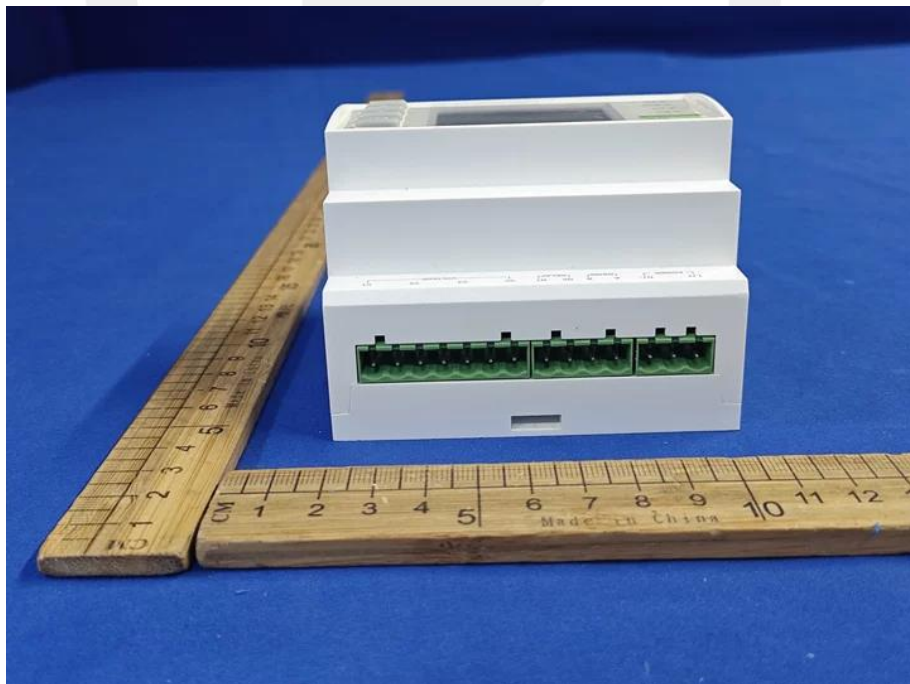
16.9. Photo of Magnetic Field Susceptibility Test

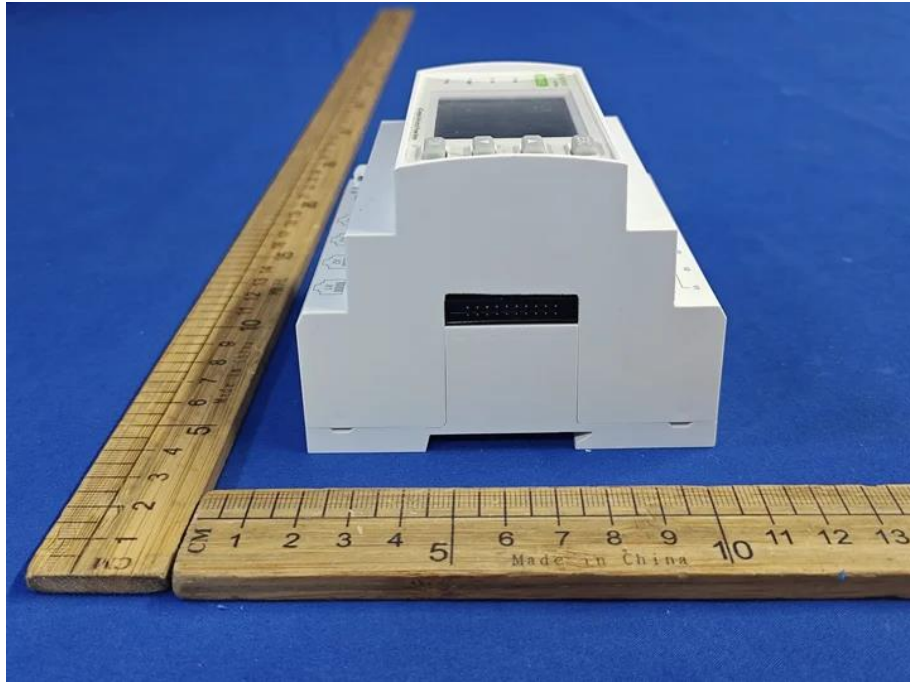


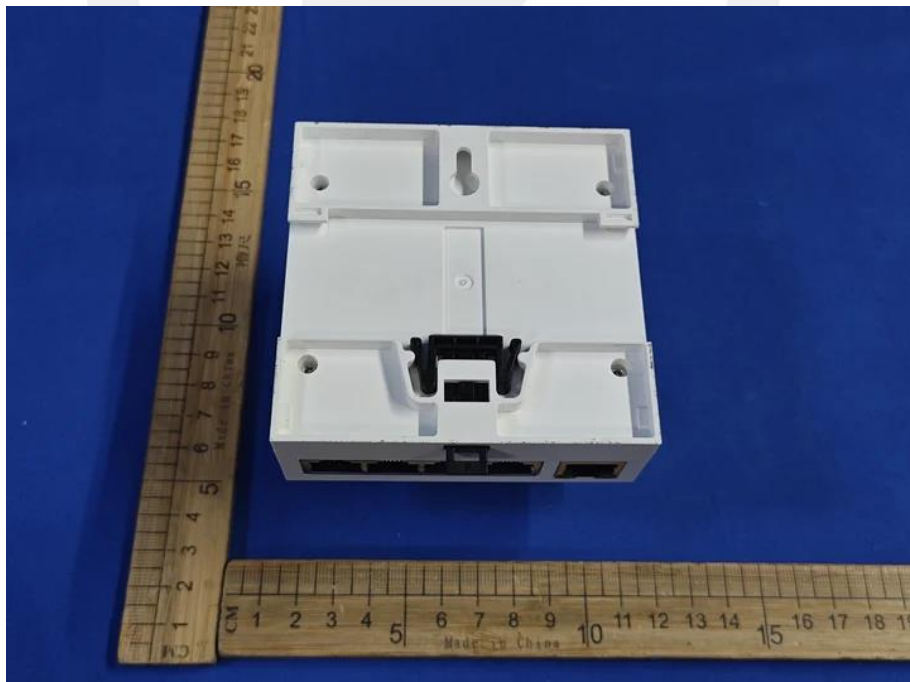
16.10. Photo of Voltage Dips And Interruptions

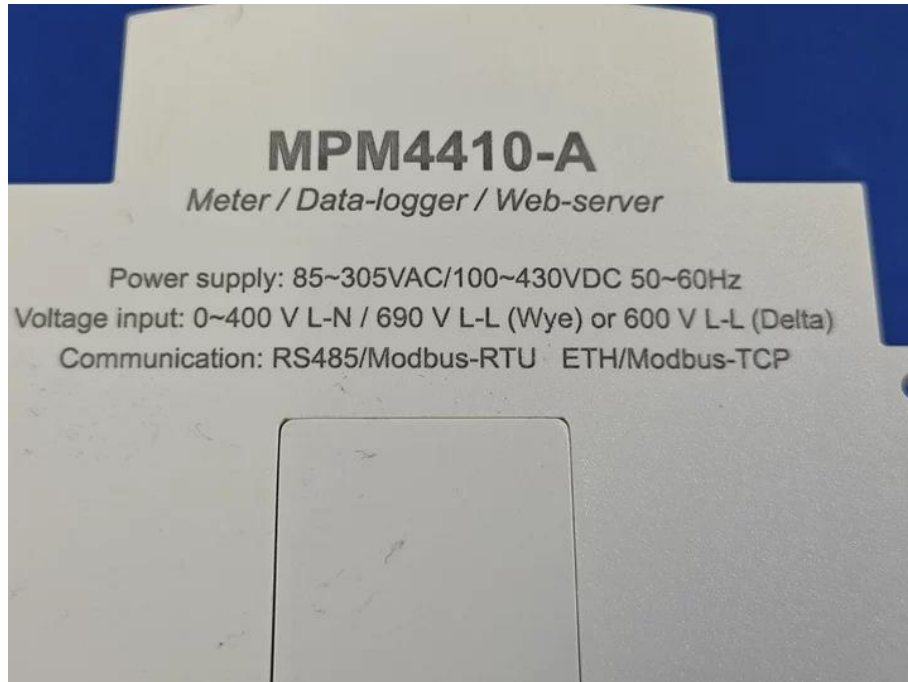


APPENDIX (Photos of EUT)









End of Report

Statement

- 1 . This report is invalid without the signature of the authorized approver and "special seal for testing".
- 2 . This report shall not be copied partly without authorization.
- 3 . The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.
- 4 . The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
- 5 . The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.
- 6 . Objections shall be raised within 20 days from the date receiving the report.