

TEST REPORT

Application No.: GZEM2509006297HS
Applicant: Guangdong Shunde Putuo Trading Co., Ltd
Address of Applicant: Room 903, Building 2, Guanxingxuan Commercial Building, No. 4 Cuihe South Road, Ronggui Gaoli Community, Shunde District, Foshan City, Guangdong Province
Manufacturer: Guangdong Shunde Putuo Trading Co., Ltd
Address of Manufacturer: Room 903, Building 2, Guanxingxuan Commercial Building, No. 4 Cuihe South Road, Ronggui Gaoli Community, Shunde District, Foshan City, Guangdong Province
Factory: Guangdong Zhengmei Washing Appliance Co., Ltd.
Address of Factory: One of the eight floor of Plant 3, No.8 Shengkai road, Huangpu, Zhongshan, Guangdong, China
Product Name: Desktop Dishwasher
Model No.: DW5-D40, DW5-D40A, DW6-D50, DW6-D50A, D41, D43, D43A, D43B. □
□ Please refer to section 2 of this report for details.
Trade Mark: GORGENOX
Standard(s) : EN IEC 55014-1: 2021
EN IEC 55014-2: 2021
EN IEC 61000-3-2:2019+A1:2021+A2:2024
EN 61000-3-3: 2013+ A1:2019+A2:2021
Date of Receipt: 2023-05-30
Date of Test: 2023-06-01 to 2023-06-26
Date of Issue: 2025-10-28

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



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SGS-CSTC Standards Technical Services Co., Ltd. Shunde Branch

EMC-TRF-01 Rev 2.0

Report No.: GZEM230500274403C01

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Revision Record			
Version	Report No.	Date	Remark
01	GZEM230500274401	2023-09-19	Original
02	GZEM230500274402	2024-05-29	Amendment report: changed the address of Applicant & Manufacturer & Factory and added new models.
03	GZEM230500274403	2025-09-29	Amendment report: updated standard, added new models and changed rating.
C01	GZEM230500274403C01	2025-10-28	Amendment report: changed the name & address of Applicant & Manufacturer, Trade Mark and model name.

Authorized for issue by:			
		<i>Sean Li</i>	
		Sean Li/Project Engineer	
Approved By		<i>Cherie Luo</i>	
		Cherie Luo/Reviewer	



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2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Voltage Fluctuations and Flicker	EN 61000-3-3: 2013+ A1:2019+A2:2021	EN 61000-3-3: 2013+ A1:2019+A2:2021	Clause 5	Pass
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	EN IEC 55014-1: 2021	CISPR 16-2-1: 2014+A1:2017	Table 5	Pass**
Discontinuous Disturbance (150kHz-30MHz)		EN IEC 55014-1: 2021	Clause 4.4.2	Pass
Disturbance Power		CISPR 16-2-2:2010	Table 7 & 8	Pass
Harmonic Current Emission	EN IEC 61000-3-2: 2019+A1:2021+ A2:2024	EN IEC 61000-3-2: 2019+A1:2021	Class A	Pass

** : The EUT passed Conducted Emissions at AC Mains Power Port (150kHz-30MHz) test after modification.

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN IEC 55014-2: 2021	EN 61000-4-2:2009	4kV Contact Discharge, 8kV Air Discharge	Pass
Electrical Fast Transients Burst at AC Mains Power Port		EN 61000-4-4:2012	1kV, 5/50ns Tr/Td, 5kHz Repetition Frequency	Pass
Surge at AC Mains Power Port		EN 61000-4-5:2014+A1:2017	1.2/50µs Tr/Td, 1kV Line to Line, 2kV Line to Ground	Pass
Conducted Immunity at AC Mains Power Port (150kHz-230MHz)		EN 61000-4-6: 2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions		EN IEC 61000-4-11: 2020	For 50Hz: 0 % UT for 0.5cycle, 40 % UT for 10cycles, 70 % UT for 25cycles, UT is Supply Voltage	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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Remark for the report GZEM230500274401

Model No.: ZMW-DTHA-I, ZMW-DTHA-II, ZMW-DTCA-I, ZMW-DTCA-II, ZMW-DUHA-I, ZMW-DUHA-II, ZMW-DUCA-I, ZMW-DUCA-II, ZMW-STHA-I, ZMW-STHA-II, ZMW-STCA-I, ZMW-STCA-II, ZMW-SUHA-I, ZMW-SUHA-II, ZMW-SUCA-I, ZMW-SUCA-II, ZMW-PTHA-I, ZMW-PTHA-II, ZMW-PTCA-I, ZMW-PTCA-II, ZMW-PUHA-I, ZMW-PUHA-II, ZMW-PUCA-I, ZMW-PUCA-II, ZMW-DTHA01, ZMW-DUHA01, ZMW-DTHA02, ZMW-DTHA03, ZMW-DUHA02, ZMW-DUHA03.

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on outer decoration, installation position of control board, structure and below information.

Model No.	Multiple water inlet method D	Single water tank mode S	Single faucet mode P	Soft water function T/U
ZMW-DTHA-I, ZMW-DTHA01, ZMW-DTHA-II, ZMW-DTHA02, ZMW-DTHA03	√			√
ZMW-DTCA-I, ZMW-DTCA-II				
ZMW-DUHA-I, ZMW-DUHA01, ZMW-DUHA-II, ZMW-DUHA02, ZMW-DUHA03				
ZMW-DUCA-I, ZMW-DUCA-II				
ZMW-STHA-I, ZMW-STHA-II		√		√
ZMW-STCA-I, ZMW-STCA-II				
ZMW-SUHA-I, ZMW-SUHA-II				
ZMW-SUCA-I, ZMW-SUCA-II				
ZMW-PTHA-I, ZMW-PTHA-II			√	√
ZMW-PTCA-I, ZMW-PTCA-II				
ZMW-PUHA-I, ZMW-PUHA-II				
ZMW-PUCA-I, ZMW-PUCA-II				

Therefore only one model **ZMW-DTHA-I** was tested in this report.



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Remark for the report GZEM230500274402

This report GZEM230500274402 was an additional report based on the original report GZEM230500274401, just changed the address of Applicant & Manufacturer & Factory and added new models.

1. Changed the address of Applicant & Manufacturer & Factory:

Address of Applicant & Manufacturer & Factory in original report	Address of Applicant & Manufacturer & Factory in updated report
The 8th Floor of the third workshop of Zhongshan Zhengmei Electric Appliance Industrial Co., LTD Maxin Industrial Zone, Huangpu Town, Zhongshan, Guangdong, China	One of the eighth floor of Plant 3, No.8 Shengkai Road, Huangpu Town, Zhongshan City

2. Added below new models:

ZMW-DTHC01, ZMW-DUHC01, ZMW-DTCC01, ZMW-DUCC01, ZMW-DTHC02, ZMW-DUHC02, ZMW-DTCC02, ZMW-DUCC02, ZMW-DTHC03, ZMW-DUHC03, ZMW-DTCC03, ZMW-DUCC03, ZMW-DTHC04, ZMW-DUHC04, ZMW-DTCC04, ZMW-DUCC04.

According to the declaration of the applicant, the new models supplemented in this report and models in the original report were identical, with only difference being the outer decoration and capacity.

Model No.	Multiple water inlet method D	Soft water function T/U
ZMW-DTHC01, ZMW-DTCC01, ZMW-DTHC02, ZMW-DTCC02, ZMW-DTHC03, ZMW-DTCC03, ZMW-DTHC04, ZMW-DTCC04	√	√
ZMW-DUHC01, ZMW-DUCC01, ZMW-DUHC02, ZMW-DUCC02, ZMW-DUHC03, ZMW-DUCC03, ZMW-DUHC04, ZMW-DUCC04		

This was considered to be none technical changed and no tests were performed on the product. Therefore, original data was kept in this report GZEM230500274402.



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Remark for the report GZEM230500274403

This report GZEM230500274403 was an additional report based on the previous report GZEM230500274402, just updated standard, added new models and changed rating.

1. Updated below standard:

Standard in previous report	Standard in updated report
EN IEC 61000-3-2:2019+A1:2021	EN IEC 61000-3-2:2019+A1:2021+A2:2024

Reviewed the updated standard, all the technical requirements for the product between original and the newest standards' versions are identical, therefore it's acceptable to update standard(s) without further testing.

2. Added new models: ZMW-DTHA04, ZMW-DUHA04, ZMW-DTHC05, ZMW-DUHC05, ZMW-DTHC06, ZMW-DUHC06, ZMW-DTHC07, ZMW-DUHC07, ZMW-DTHA05, ZMW-DUHA05, ZMW-DTHA06, ZMW-DUHA06, ZMW-DTHA07, ZMW-DUHA07.

According to the declaration of the applicant, the models supplemented in this report and models in the original report were identical, with only difference being the outer decoration.

3. Change rating voltage form AC 220V to AC 220-240V.

This was considered to be none technical changed and no tests were performed on the product. Therefore, test data in report GZEM230500274402 was kept in this report GZEM230500274403.



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Remark for the report GZEM230500274403C01

This report GZEM230500274403C01 was an amendment report based on the previous report GZEM230500274403, just changed below information.

1. Changed the Name & Address of Applicant & Manufacturer:

Name & Address of Applicant & Manufacturer in previous report	Name & Address of Applicant & Manufacturer in updated report
Guangdong Zhengmei Washing Appliance Co., Ltd. One of the eight floor of Plant 3, No.8 Shengkai road, Huangpu, Zhongshan, Guangdong, China	Guangdong Shunde Putuo Trading Co., Ltd Room 903, Building 2, Guanxingxuan Commercial Building, No. 4 Cuihe South Road, Ronggui Gaoli Community, Shunde District, Foshan City, Guangdong Province

2. Changed Trade Mark:

Trade Mark in previous report	Trade Mark in updated report
/	GORGENOX

3. Changed Model Name:

Model name in previous report	Model name in updated report
ZMW-DUHC02	DW5-D40
ZMW-DTHC02	DW5-D40A
ZMW-DUHA-II	DW6-D50
ZMW-DTHA-II	DW6-D50A
ZMW-DTHC01	D41
ZMW-DTHC03	D43
ZMW-DUHC03	D43A
ZMW-DTHC04	D43B

According to the declaration of the applicant, the models listed in the same row of above table were identical, with only difference being the model name and Trade Mark.

Therefore, test data in GZEM230500274403 was kept in this report GZEM230500274403C01.



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4 General Information

4.1 Details of E.U.T.

Power supply: Rating: AC 220-240V, 50Hz
Test Voltage: AC 230V, 50Hz
Clock frequency: Less than 15MHz
Cable(s): 3 wires unscreened AC mains cable

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
N/A	N/A	N/A	N/A
The EUT has been tested with water.			

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	2.76dB (150kHz to 30MHz)
Disturbance Power	3.62dB(30MHz-300MHz)
Remark: The U_{lab} (lab Uncertainty) is less than U_{cisp} (CISPR Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.	

4.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Shunde Branch
Building 1, Europe Industrial Park, No.1, Shunhe South Road, Wusha, Daliang, Shunde District, Foshan, Guangdong, China

4.5 Deviation from Standards

None

4.6 Abnormalities from Standard Conditions

The EUT passed Conducted Emissions at AC Mains Power Port (150kHz-30MHz) test after modification.

4.7 EMS Monitor

Visual: LED display indication of the EUT
Other: Motor running



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5 Equipment List

Voltage Fluctuations and Flicker					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
AC Power Source	California	50001iX	EMC0608	2023-03-23	2024-03-22
Power Analyzer	California	PACS	EMC0607	2023-03-23	2024-03-22
Test Software CTS4	California	Ver 4.14.0	GZE100-66	N/A	N/A

Conducted Emissions at AC Mains Power Port (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	8m x 4m x 3.3m	EMC2067	2021-09-10	2024-09-09
Two-Line V-Network	Rohde & Schwarz	ENV216	EMC0118	2022-12-16	2023-12-15
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESR3	EMC2037	2022-09-09	2023-09-08

Discontinuous Disturbance (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI Receiver	Rohde & schwarz	ESR3	EMC2037	2022-09-09	2023-09-08
LISN	Rohde & schwarz	ENV 216	EMC0118	2022-12-16	2023-12-15

Disturbance Power					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	8m x 4m x 3.3m	EMC2067	2021-09-10	2024-09-09
Absorbing Clamp	SCHWARZBECK	MDS 21C	EMC2232	2023-04-04	2024-04-03
6 dB Attenuator with 5m length cable	SCHWARZBECK	DGA9552N	EMC2233	2023-04-04	2024-04-03
EMI Receiver	Rohde & Schwarz	ESR3	EMC2037	2022-09-09	2023-09-08

Harmonic Current Emission					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
AC Power Source	California	50001iX	EMC0608	2023-03-23	2024-03-22
Power Analyzer	California	PACS	EMC0607	2023-03-23	2024-03-22
Test Software CTS4	California	Ver 4.14.0	GZE100-66	N/A	N/A

Electrostatic Discharge					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
ESD Simulator-E	TESEQ	NSG435	EMC2071	2022-07-06	2023-07-05
ESD Ground Plane	SGS-EMC	3m x 3m	EMC0804	N/A	N/A



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Electrical Fast Transients Burst at AC Mains Power Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Test System	EMC PARTNER	TRANSIENT 2000	EMC2218	2023-02-28	2024-02-27

Surge at AC Mains Power Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Test System	EMC PARTNER	TRANSIENT 2000	EMC2218	2023-02-28	2024-02-27

Conducted Immunity at AC Mains Power Port (150kHz-230MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Signal Generator	Rohde & Schwarz	SMY01	EMC1101	2023-05-15	2024-05-14
Amplifier	Schaffner	GRF5048	EMC1102	2023-05-15	2024-05-14
Power Meter	Rohde & Schwarz	NRVS	EMC1103	2022-12-07	2023-12-06
URV5-Z2 10V Insertion Unit	Rohde & Schwarz	URV5-Z2	EMC2052	2022-12-07	2023-12-06
Dual Directional Coupler	SCHAFFNER	C1795	EMC0906	2023-05-15	2024-05-14

Voltage Dips and Interruptions					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Test System	EMC PARTNER	TRANSIENT 2000	EMC2218	2023-02-28	2024-02-27

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2023-06-11	2024-06-10
DMM	Fluke	73	EMC0007	2023-06-11	2024-06-10



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6 Emission Test Results

6.1 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3: 2013+ A1:2019+A2:2021

Test Method: EN 61000-3-3: 2013+ A1:2019+A2:2021

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

Humidity: 42.8 % RH

Atmospheric Pressure: 1000 mbar

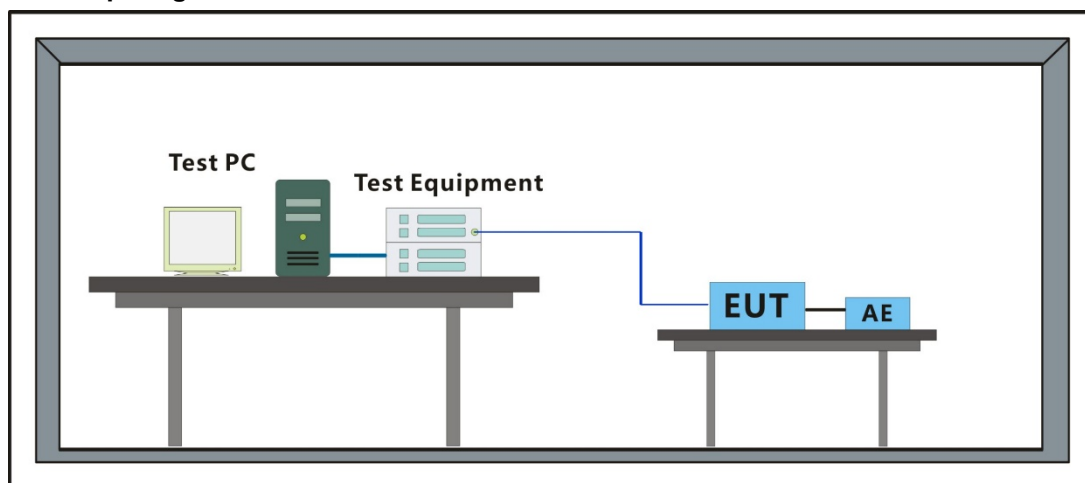
6.1.2 Test Mode Description

Pre-scan / Mode Description

Final test Code

Final test 00 Test the EUT in heating and motor running mode.

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data



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Test Mode: 00

Flicker Test Summary per EN 61000-3-3: 2013+ A1:2019+A2:2021

Test category: All parameters (European limits)

Test Margin: 100

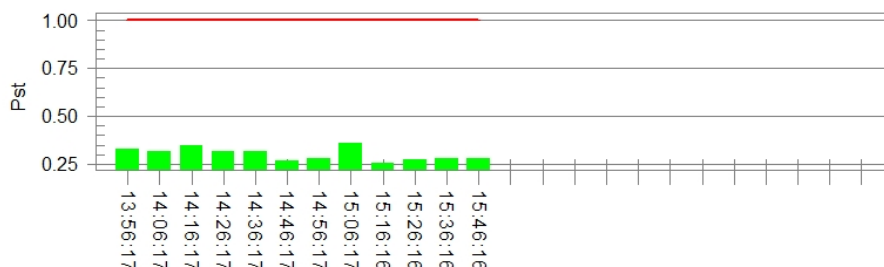
Test duration (min): 120

Test Result: Pass

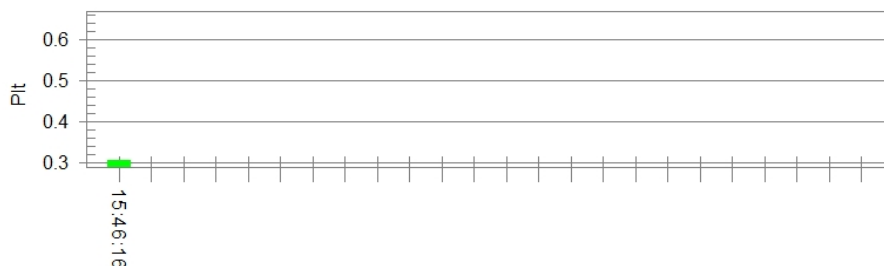
Status: Test Completed

Pst, and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.72

Highest dt (%):

0

T-max (mS):

0.79

Highest dc (%):

0.81

Highest dmax (%):

0.360

Highest Pst (10 min. period):

0.305

Highest Plt (2 hr. period):

Test limit (%):

Test limit (mS):

500.0

Pass

Test limit (%):

3.30

Pass

Test limit (%):

4.00

Pass

Test limit:

1.000

Pass

Test limit:

0.650

Pass



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6.2 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement:	EN IEC 55014-1: 2021
Test Method:	CISPR 16-2-1:2014+A1:2017
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 59dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

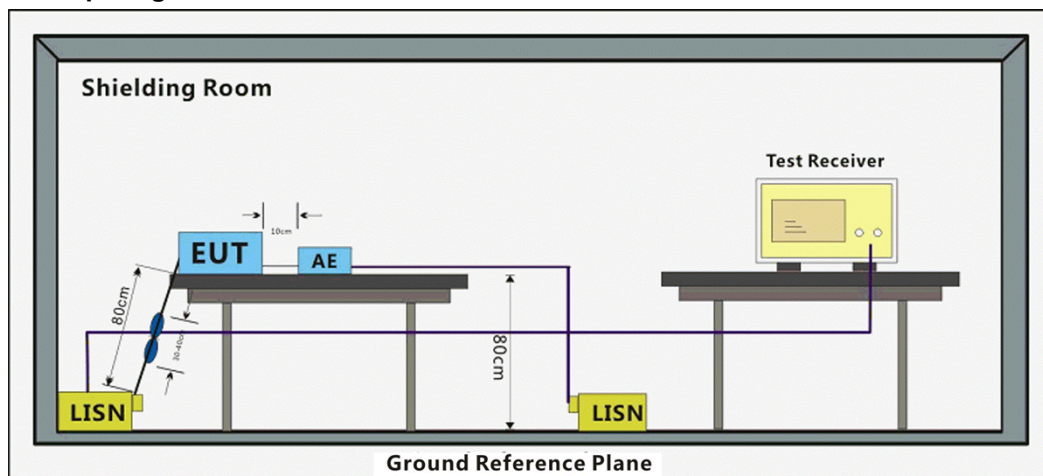
6.2.1 E.U.T. Operation

Operating Environment:	
Temperature:	25.2 °C
Humidity:	42.4 % RH
Atmospheric Pressure:	1000 mbar

6.2.2 Test Mode Description

Pre-scan / Mode	Description
Final test Code	
Final test 00	Test the EUT in heating and motor running mode.

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

Frequency Range: 150kHz to 30MHz

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + LISN Factor

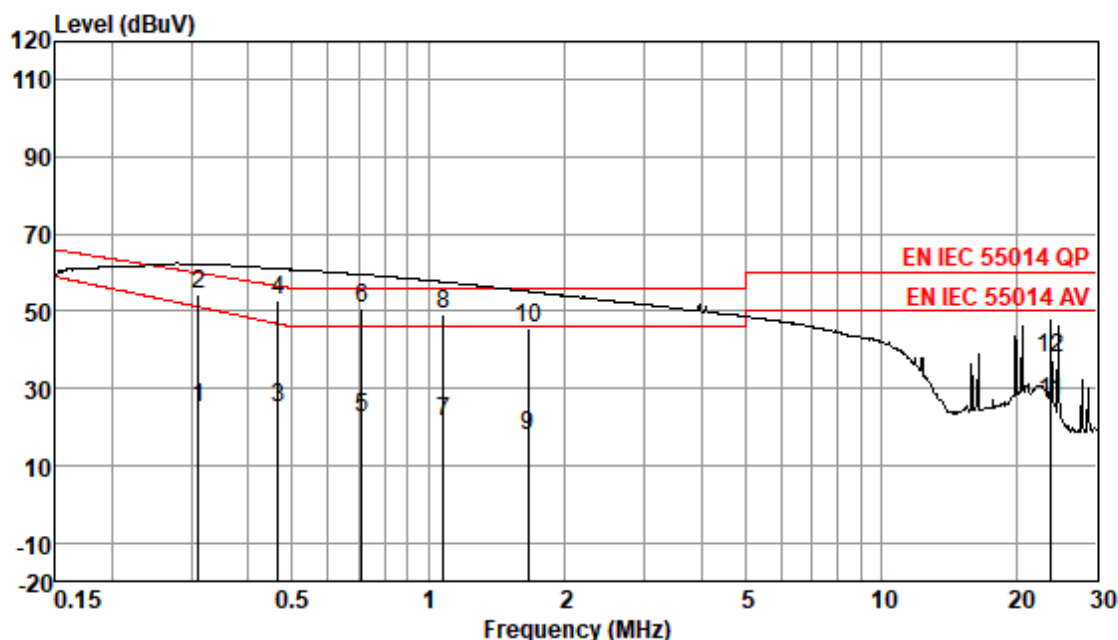


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Test Mode: 00; Line: Live line



Model :
Test Mode:00

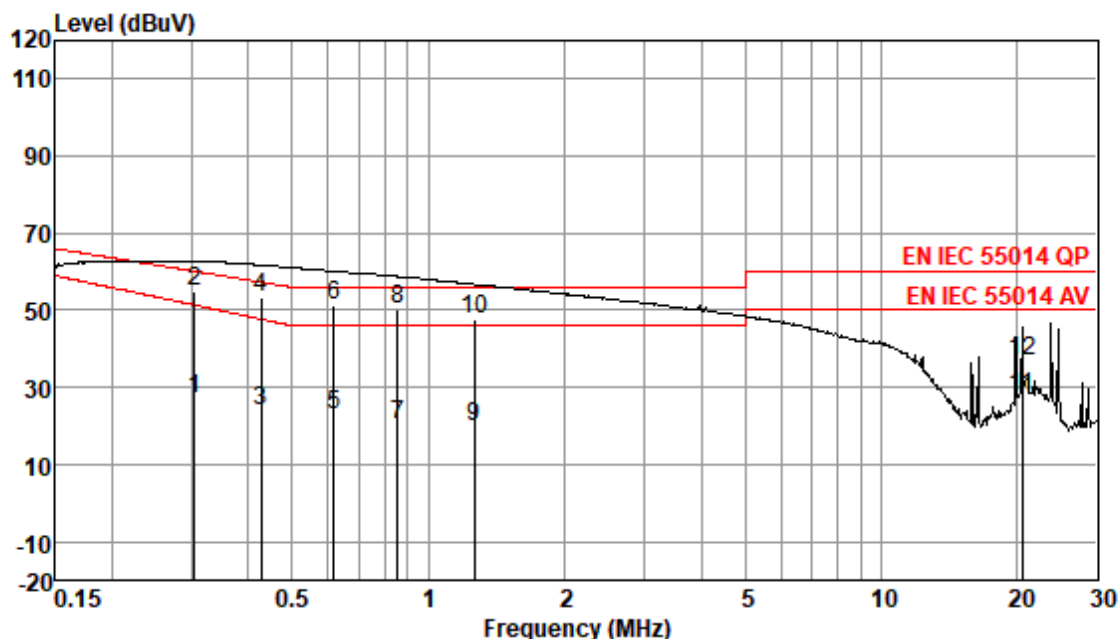
Frequency MHz	Read Level dBuV	LISN Factor dB	Cable Loss dB	Measured Level dBuV	Limit Line dBuV	Over limit dB	Remark
0.31	15.33	9.58	0.29	25.20	51.16	-25.96	Average
0.31	44.63	9.58	0.29	54.50	59.97	-5.47	QP
0.47	15.29	9.59	0.30	25.18	46.76	-21.58	Average
0.47	42.88	9.59	0.30	52.77	56.58	-3.81	QP
0.71	12.18	9.60	0.39	22.17	46.00	-23.83	Average
0.71	40.75	9.60	0.39	50.74	56.00	-5.26	QP
1.08	11.47	9.62	0.35	21.44	46.00	-24.56	Average
1.08	39.00	9.62	0.35	48.97	56.00	-7.03	QP
1.66	7.94	9.62	0.35	17.91	46.00	-28.09	Average
1.66	35.80	9.62	0.35	45.77	56.00	-10.23	QP
23.76	15.98	10.08	0.29	26.35	50.00	-23.65	Average
23.76	27.52	10.08	0.29	37.89	60.00	-22.11	QP



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Test Mode: 00; Line: Neutral Line



Model :
Test Mode:00

Frequency MHz	Read Level dBuV	LISN Factor dB	Cable Loss dB	Measured Level dBuV	Limit Line dBuV	Over limit dB	Remark
0.30	17.22	9.60	0.29	27.11	51.39	-24.28	Average
0.30	44.89	9.60	0.29	54.78	60.15	-5.37	QP
0.43	14.30	9.61	0.25	24.16	47.73	-23.57	Average
0.43	43.74	9.61	0.25	53.60	57.33	-3.73	QP
0.62	13.06	9.62	0.38	23.06	46.00	-22.94	Average
0.62	41.46	9.62	0.38	51.46	56.00	-4.54	QP
0.85	10.54	9.63	0.37	20.54	46.00	-25.46	Average
0.85	40.02	9.63	0.37	50.02	56.00	-5.98	QP
1.26	9.57	9.63	0.34	19.54	46.00	-26.46	Average
1.26	37.88	9.63	0.34	47.85	56.00	-8.15	QP
20.49	17.36	10.10	0.32	27.78	50.00	-22.22	Average
20.49	26.19	10.10	0.32	36.61	60.00	-23.39	QP



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6.3 Discontinuous Disturbance (150kHz-30MHz)

Test Requirement: EN IEC 55014-1: 2021

Test Method: EN IEC 55014-1: 2021

Limit:

Provision	Click Rate (N)		
1	All clicks < 20 ms	90 % click < 10 ms	$N \leq 5$
2	$N \leq 0,2$	$L_q^b = L^a + 44$	Clicks ^c $\leq 25\%$ exceed L_q^b
3	$30 \geq N > 0,2$	$L_q^b = L^a + 20 \lg(30/N)$	Clicks ^c $\leq 25\%$ exceed L_q^b

^a The limits L of Conducted Emissions apply also to discontinuous disturbances from all equipment which produce:

- 1) disturbances other than clicks, or
- 2) clicks with a click rate N equal to or greater than 30

^b The click limit L_q is calculated by increasing the relevant quasi-peak limit L for continuous disturbances by certain value.

The click limit applies to the disturbance assessed according to the upper quartile method

^c a quarter of the number of the clicks registered during the observation time T is allowed to exceed the click limit L_q

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 42.3 % RH

Atmospheric Pressure: 1000 mbar

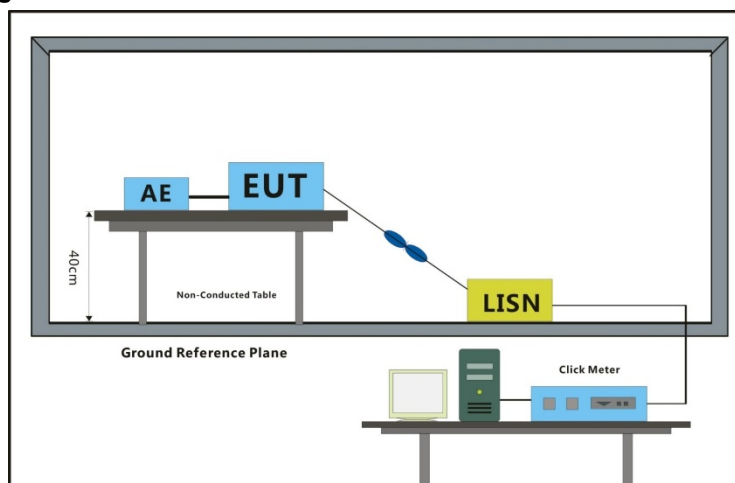
6.3.2 Test Mode Description

Pre-scan / Mode Description

Final test Code

Final test 00 Test the EUT in heating and motor running mode.

6.3.3 Test Setup Diagram



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6.3.4 Measurement Procedure and Data

Frequency Range: 150kHz to 30MHz

Test Mode: 00

Meas Duration	2:00:00	LISN Phase: -	Attenuation [dB]	40
Overload	NO			
Frequency	150 kHz	500 kHz	1.4 MHz	30 MHz
Clicks (< 10 ms)	15	8	0	0
Clicks (10ms - 20ms)	0	0	0	0
Clicks (> 20 ms)	0	0	0	0
Click Rate [1/min]	0.13	0.07	0.07	0.07
Continuous Disturbances	0	0	0	0
L [dBuV]	66	56	56	60
Lq [dBuV]	110	100	100	104
Clicks > Lq	0	0	0	0
Clicks > Lq [%]	0	0	0	0
Fridge Rules	0	0	0	0
600 ms Rule used	NO	NO	NO	NO
Overall Correction	.42	.32	.37	1.8
Margin for PK Detector	0	0	0	0
Result	PASSED	PASSED	PASSED	PASSED



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6.4 Disturbance Power

Test Requirement:	EN IEC 55014-1: 2021
Test Method:	CISPR 16-2-2:2010
Limit:	
30MHz- 300MHz:	45dB(pW)-55dB(pW) quasi-peak, 35dB(pW)-45dB(pW) average
200MHz- 300MHz:	0dB(pW)-10dB(pW) quasi-peak (reduction limit)
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 300MHz

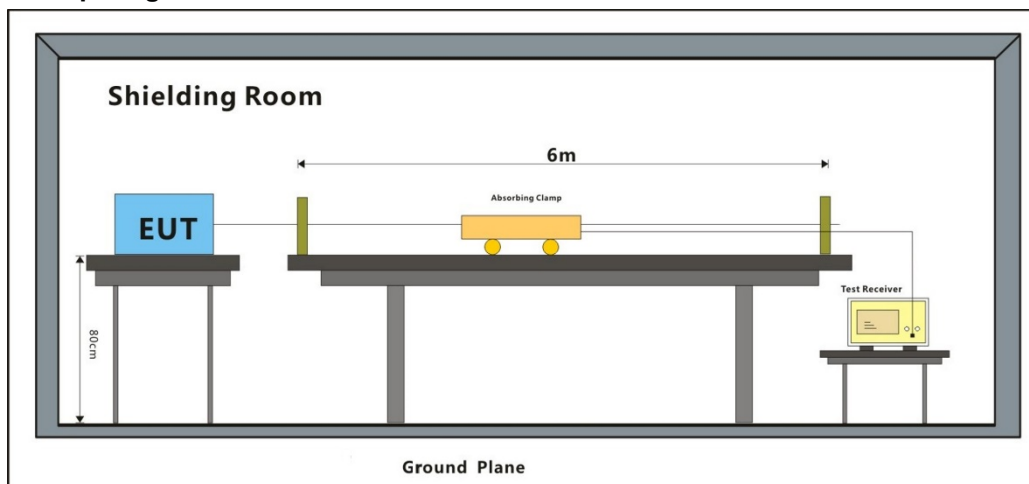
6.4.1 E.U.T. Operation

Operating Environment:			
Temperature:	25.2 °C	Humidity:	42.3 % RH
		Atmospheric Pressure:	1000 mbar

6.4.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Frequency Range: 30MHz to 300MHz

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + Clamp Factor

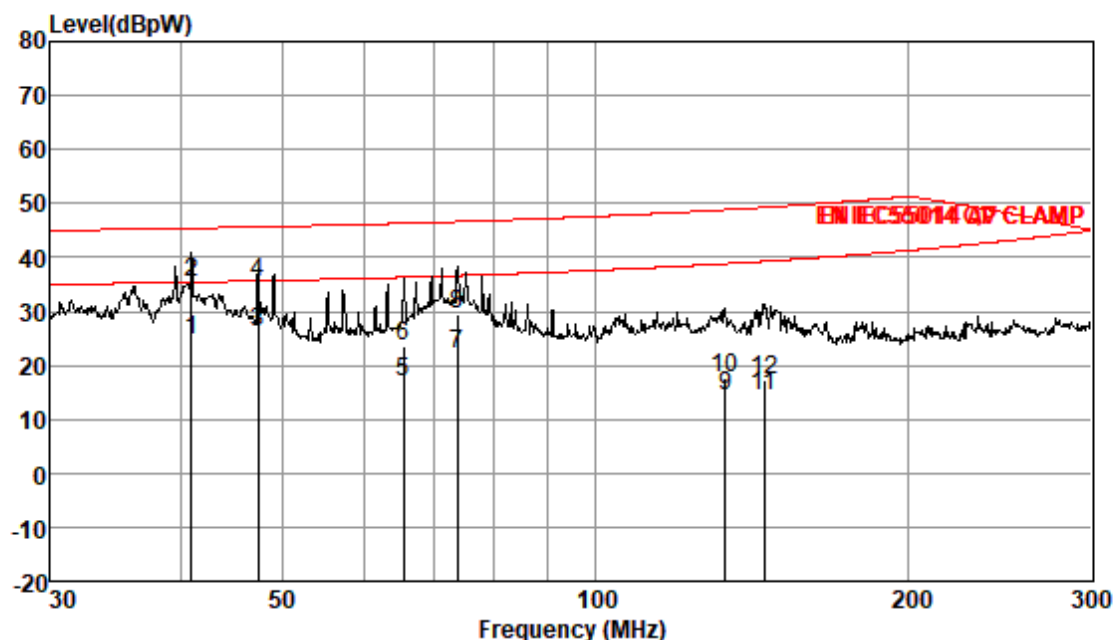


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Test Mode: 00



Model: :
Test Mode:00

Frequency MHz	Read Level dBuv	Clamp Factor dBpW	Cable Loss dB	Measured Level dBpW	Limit Line dBpW	Over limit dB	Remark
40.94	17.83	-0.43	7.41	24.81	35.41	-10.60	Average
40.94	28.25	-0.43	7.41	35.23	45.41	-10.18	QP
47.44	18.53	0.20	7.50	26.23	35.65	-9.42	Average
47.44	27.65	0.20	7.50	35.35	45.65	-10.30	QP
65.48	10.59	-1.34	7.73	16.98	36.31	-19.33	Average
65.48	17.29	-1.34	7.73	23.68	46.31	-22.63	QP
73.81	14.41	-0.24	7.85	22.02	36.62	-14.60	Average
73.81	21.95	-0.24	7.85	29.56	46.62	-17.06	QP
133.39	8.71	-2.63	8.42	14.50	38.83	-24.33	Average
133.39	11.94	-2.63	8.42	17.73	48.83	-31.10	QP
145.25	8.64	-2.81	8.56	14.39	39.27	-24.88	Average
145.25	11.65	-2.81	8.56	17.40	49.27	-31.87	QP



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6.5 Harmonic Current Emission

Test Requirement: EN IEC 61000-3-2: 2019+A1:2021

Test Method: EN IEC 61000-3-2: 2019+A1:2021

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 42.5 % RH

Atmospheric Pressure: 1000 mbar

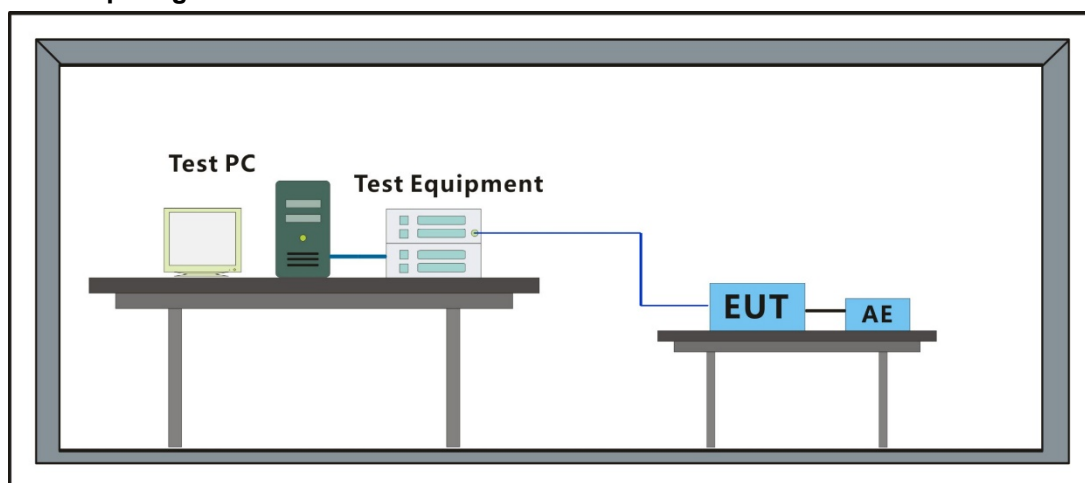
6.5.2 Test Mode Description

Pre-scan / Mode Description

Final test Code

Final test 00 Test the EUT in heating and motor running mode.

6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

Frequency Range: 100Hz to 2kHz



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Test Mode: 00

Harmonics – Class-A per EN IEC 61000-3-2: 2019+A1:2021

Test category: Class-A (European limits)

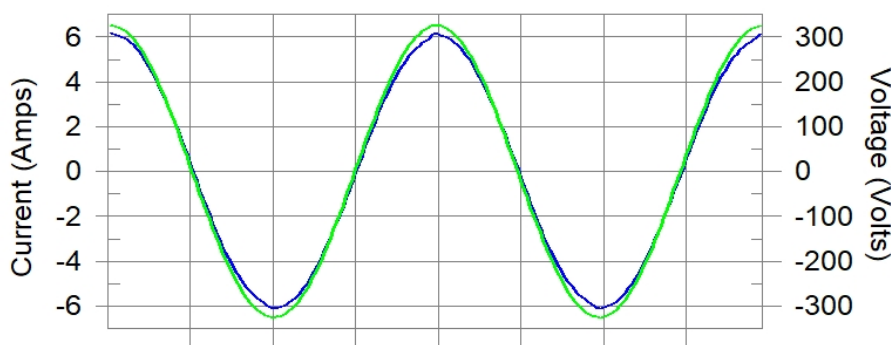
Test Margin: 100

Test duration (min): 2.5

Test Result: Pass

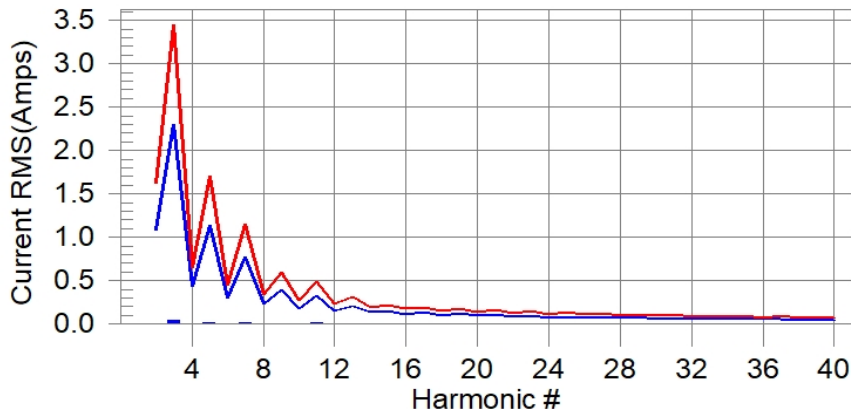
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H3-1.4% of 150% limit, H3-2% of 100% limit



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Test Mode: 00

Current Test Result Summary (Run time)

Test category: Class-A (European limits) Test Margin: 100
 Test duration (min): 2.5
 Test Result: Pass Source qualification: Normal
 THC(A): 0.056 I-THD(%): 1.3 POHC(A): 0.008 POHC Limit(A): 0.251

Highest parameter values during test:

V_{RMS} (Volts): 229.95 Frequency(Hz): 50.00
 I_{Peak} (Amps): 6.202 I_{RMS} (Amps): 4.308
 I_{Fund} (Amps): 4.306 Crest Factor: 1.441
 Power (Watts): 989.9 Power Factor: 1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.004	1.080	N/A	0.006	1.620	N/A	Pass
3	0.047	2.300	2.0	0.049	3.450	1.4	Pass
4	0.002	0.430	N/A	0.003	0.645	N/A	Pass
5	0.021	1.140	N/A	0.021	1.710	N/A	Pass
6	0.001	0.300	N/A	0.002	0.450	N/A	Pass
7	0.011	0.770	N/A	0.012	1.155	N/A	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.007	0.400	N/A	0.007	0.600	N/A	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.009	0.330	N/A	0.010	0.495	N/A	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.008	0.210	N/A	0.008	0.315	N/A	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.006	0.150	N/A	0.006	0.225	N/A	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.006	0.132	N/A	0.006	0.198	N/A	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.005	0.118	N/A	0.005	0.178	N/A	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.003	0.107	N/A	0.004	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.004	0.098	N/A	0.004	0.147	N/A	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.003	0.090	N/A	0.003	0.135	N/A	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.002	0.078	N/A	0.002	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.002	0.073	N/A	0.002	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.001	0.068	N/A	0.001	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.001	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.001	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass



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7 Immunity Test Results

Performance Criteria Description

- Criterion A:** The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
- Criterion B:** The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and from what the user may reasonably expect from the apparatus if used as intended.
- Criterion C:** Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.



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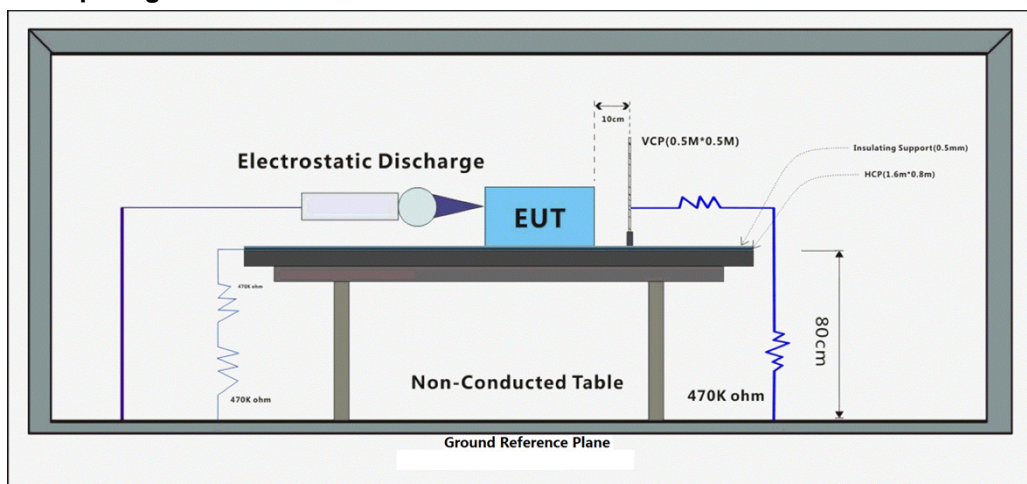
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7.1 Electrostatic Discharge

Test Requirement: EN IEC 55014-2: 2021

Test Method: EN 61000-4-2:2009

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 50.8 % RH

Atmospheric Pressure: 1000 mbar

7.1.3 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.
Final test	01	Test the EUT in idle mode.

7.1.4 Test Condition and Results:

Performance Criterion: B

Discharge Impedance: 330 Ω / 150 pF

Discharge Voltage: Air Discharge: 8 kV; Contact Discharge: 4 kV; VCP/HCP: 4 kV.

Polarity: Positive & Negative

Number of Discharge: Minimum 10 times at each test point

Discharge Mode: Single Discharge

Discharge Period: 1 second minimum

Test Point 1: All insulated enclosure & seams.

Test Point 2: All accessible metal parts of the enclosure.

Test Point 3: All sides.



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Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

A: No degradation in the performance of the EUT was observed



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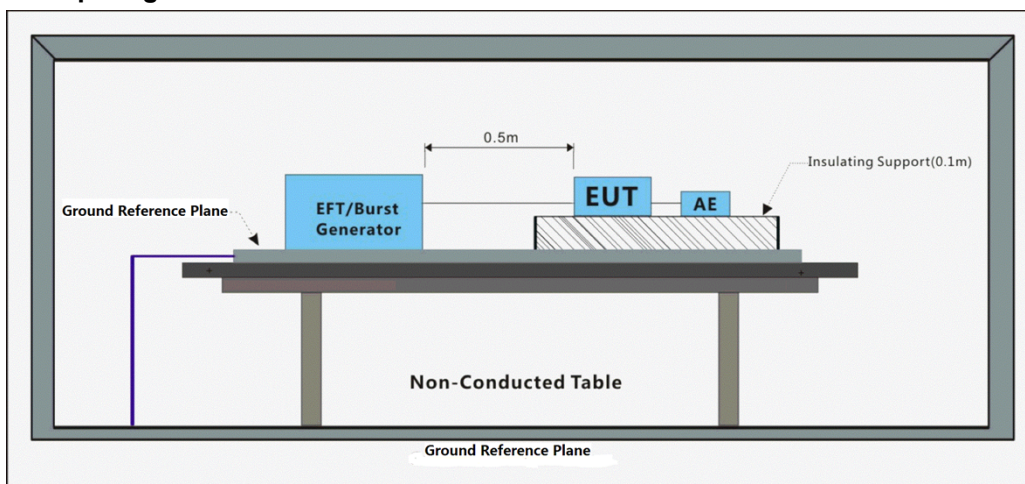
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7.2 Electrical Fast Transients Burst at AC Mains Power Port

Test Requirement: EN IEC 55014-2: 2021

Test Method: EN 61000-4-4:2012

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 50.6 % RH

Atmospheric Pressure: 1000 mbar

7.2.3 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.
Final test	01	Test the EUT in idle mode.

7.2.4 Test Condition and Results:

Performance Criterion: B

Repetition Frequency: 5kHz

Burst Period: 300ms

Test Duration: 2 minute per level & polarity

Test Level: 1.0kV

Polarity: Positive & Negative

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

A: No degradation in the performance of the EUT was observed



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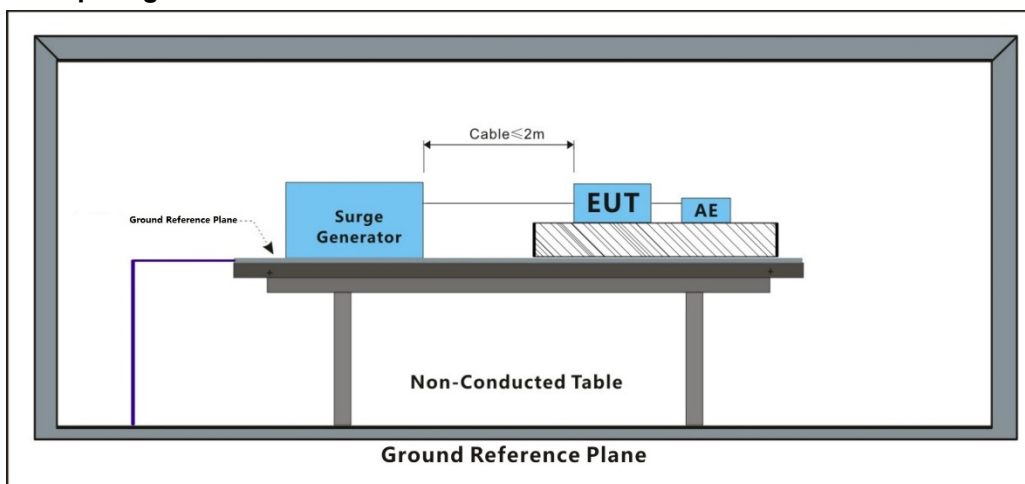
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7.3 Surge at AC Mains Power Port

Test Requirement: EN IEC 55014-2: 2021

Test Method: EN 61000-4-5:2014+A1:2017

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 50.7 % RH

Atmospheric Pressure: 1000 mbar

7.3.3 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.
Final test	01	Test the EUT in idle mode.

7.3.4 Test Condition and Results:

Performance Criterion: B

Interval: 60s between each surge

Test Level: $\pm 1\text{kV}$ Live to Neutral; $\pm 2\text{kV}$ Live, Neutral to Earth

Polarity: Positive & Negative

Generator source impedance: 2Ω

CDN coupling impedance (Line-to-ground): 10Ω

Trigger Mode: Internal

No. of surges: 5 positive at 90° , 5 negative at 270° .



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Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A
L-PE	2	+	90°	A
L-PE	2	-	270°	A
N-PE	2	+	90°	A
N-PE	2	-	270°	A

A: No degradation in the performance of the EUT was observed



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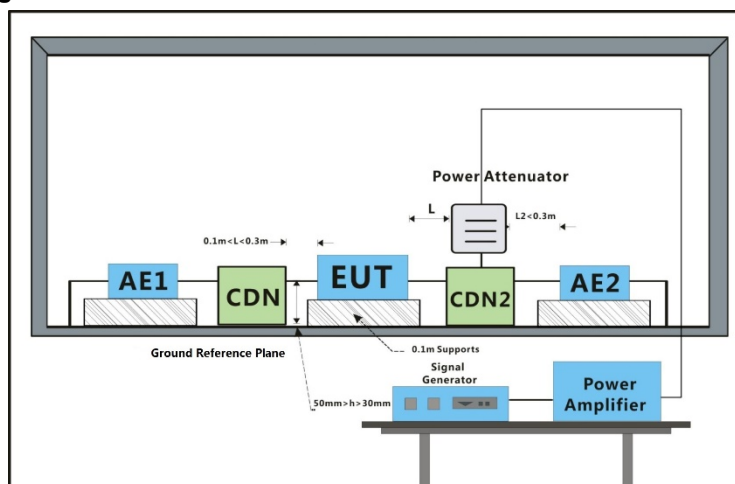
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7.4 Conducted Immunity at AC Mains Power Port (150kHz-230MHz)

Test Requirement: EN IEC 55014-2: 2021

Test Method: EN 61000-4-6: 2014

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 50.7 % RH

Atmospheric Pressure: 1000 mbar

7.4.3 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.
Final test	01	Test the EUT in idle mode.

7.4.4 Test Condition and Results:

Performance Criterion: A

Step Size: 1%

Frequency Range: 0.15MHz to 230MHz

Modulation: 80%, 1kHz Amplitude Modulation

Cable Port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	2s	A
A: No degradation in the performance of the EUT was observed				



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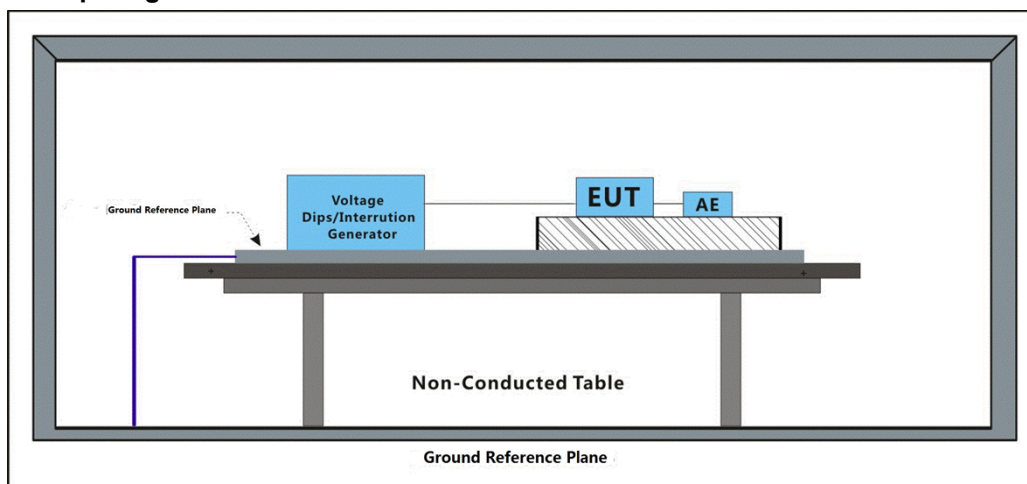
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7.5 Voltage Dips and Interruptions

Test Requirement: EN IEC 55014-2: 2021

Test Method: EN IEC 61000-4-11: 2020

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 50.8 % RH

Atmospheric Pressure: 1000 mbar

7.5.3 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	00	Test the EUT in heating and motor running mode.
Final test	01	Test the EUT in idle mode.

7.5.4 Test Condition and Results:

Performance Criterion:

For 50Hz: 0% of UT (Rated Voltage) for 0.5 Cycle: C; 40% of UT for 10 Cycles: C; 70% of UT for 25 Cycles: C.

No. of Dips / Interruptions: 3 per Level

Time between dropout: 10s



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Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycle for 50Hz	3	A
0	180°	0.5 Cycle for 50Hz	3	A
40	0°	10 Cycles for 50Hz	3	B
40	180°	10 Cycles for 50Hz	3	B
70	0°	25 Cycles for 50Hz	3	B
70	180°	25 Cycles for 50Hz	3	B

A: No degradation in the performance of the EUT was observed

B: During testing, LED display was flicking, it could recover automatically after test.



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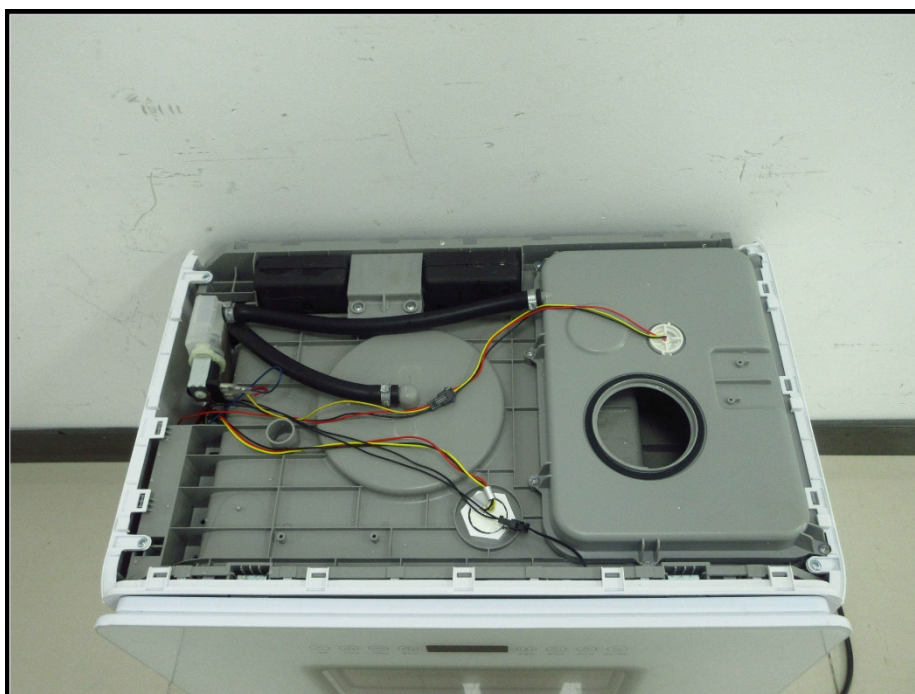
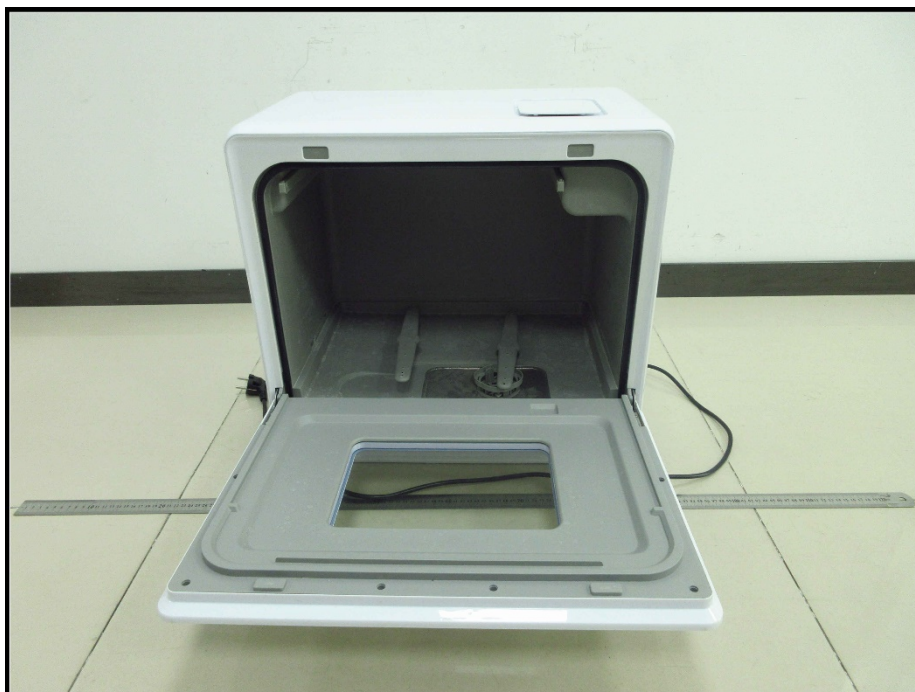
8 EUT Constructional Details (EUT Photos)



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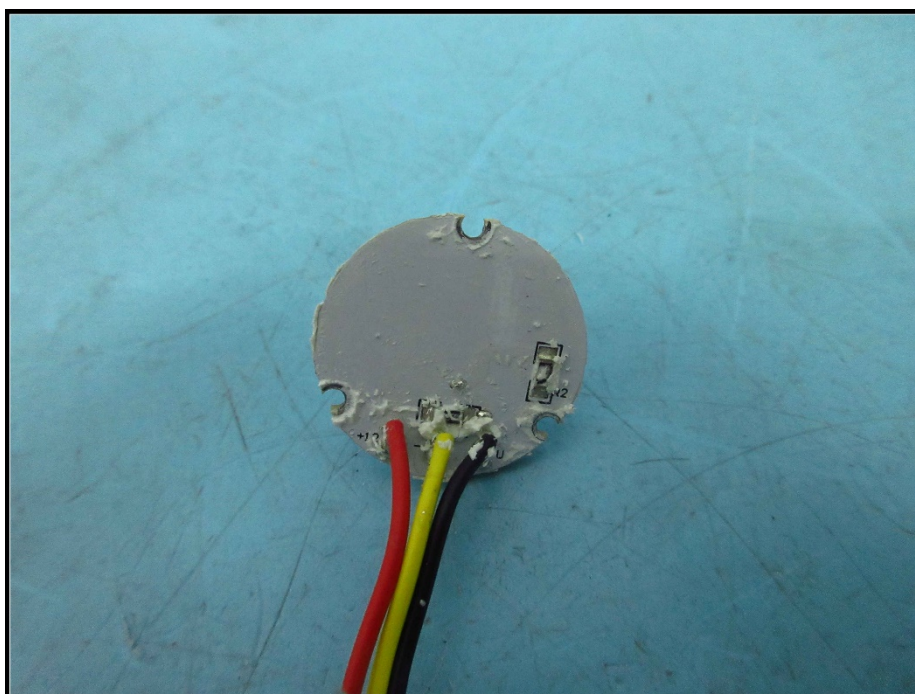


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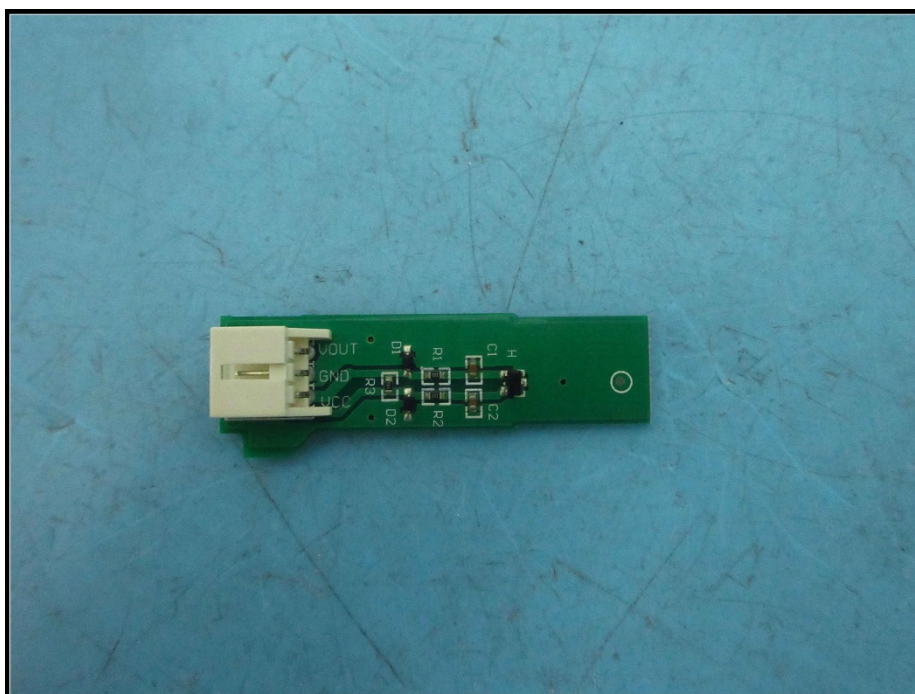
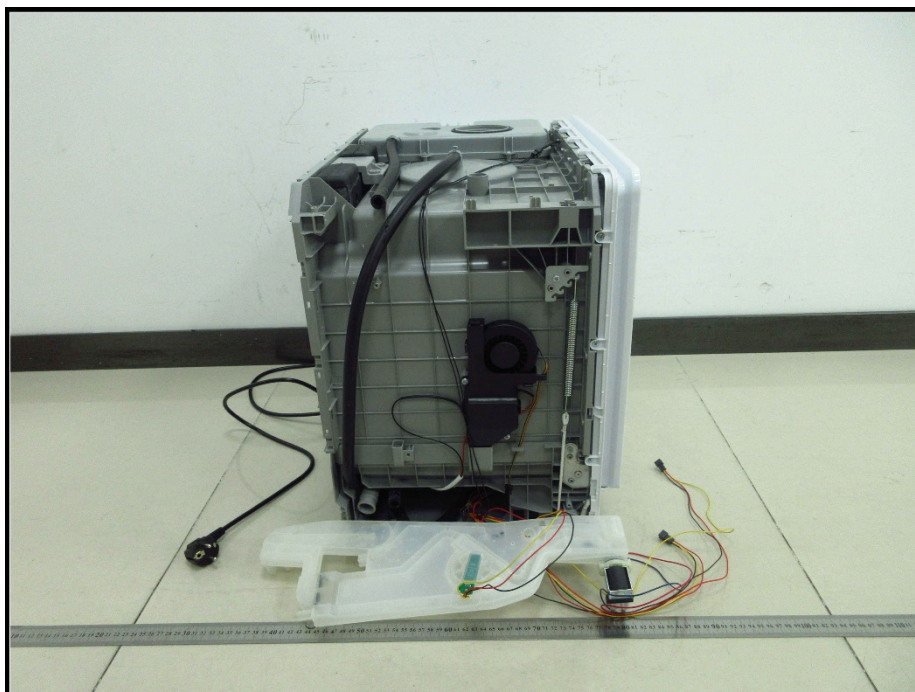
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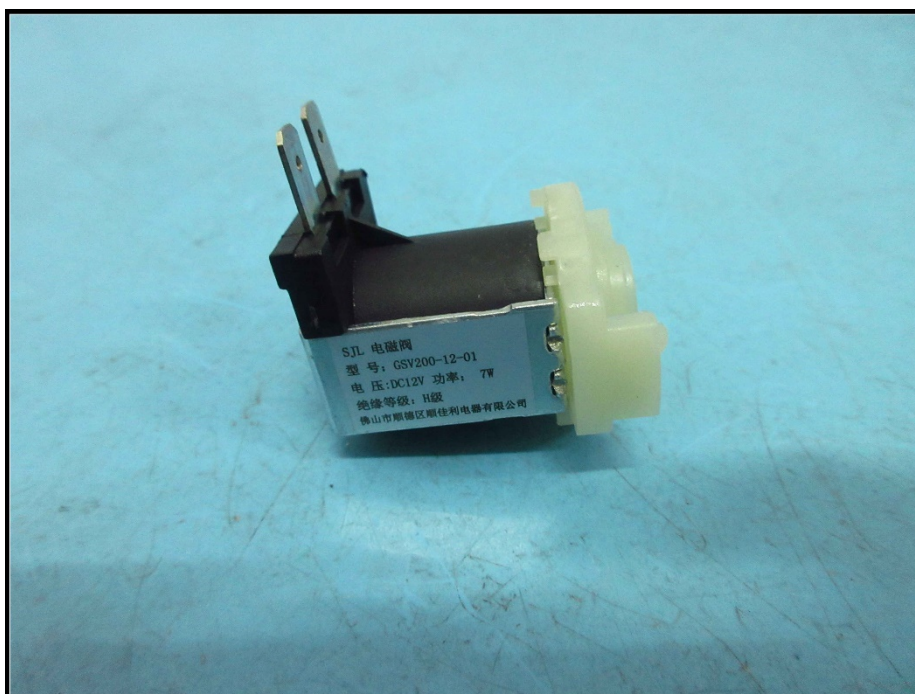
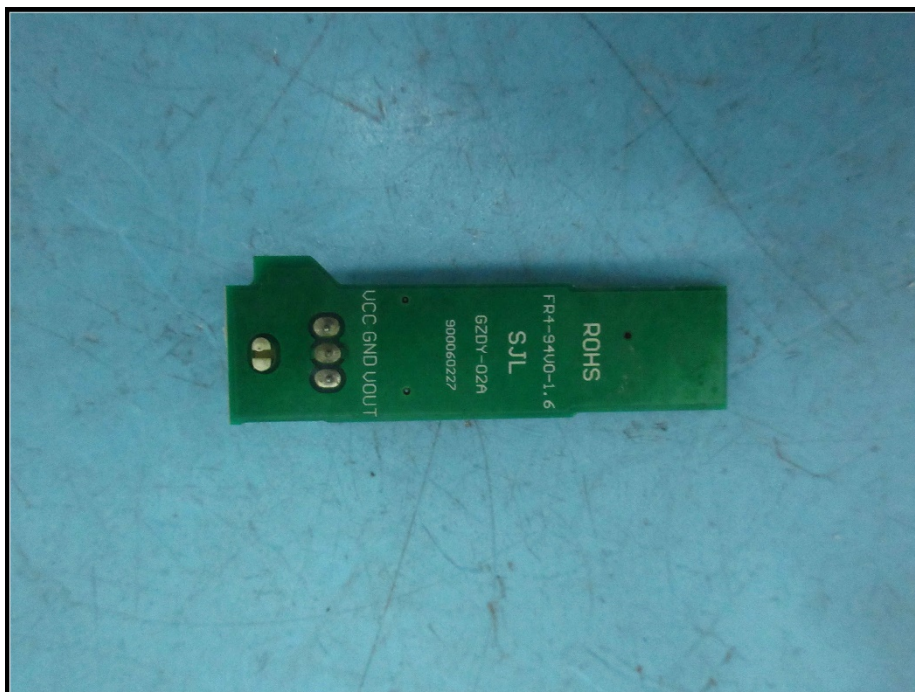
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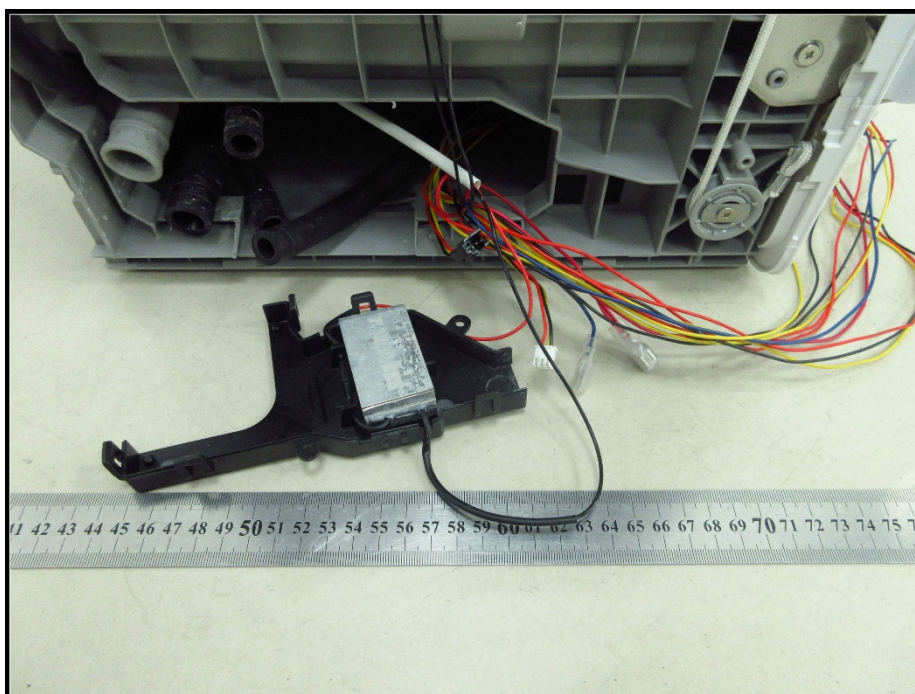
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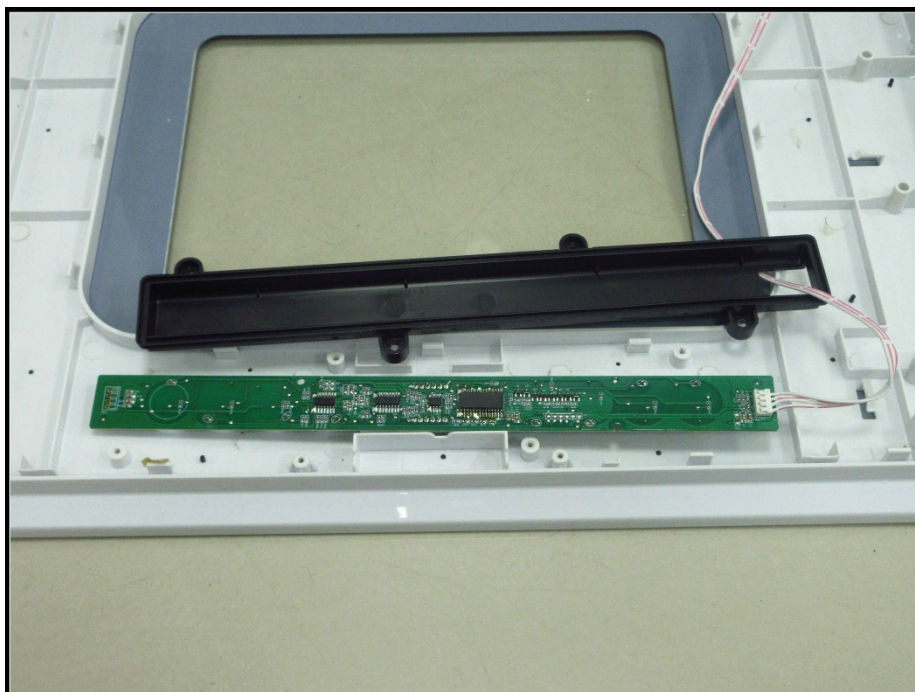


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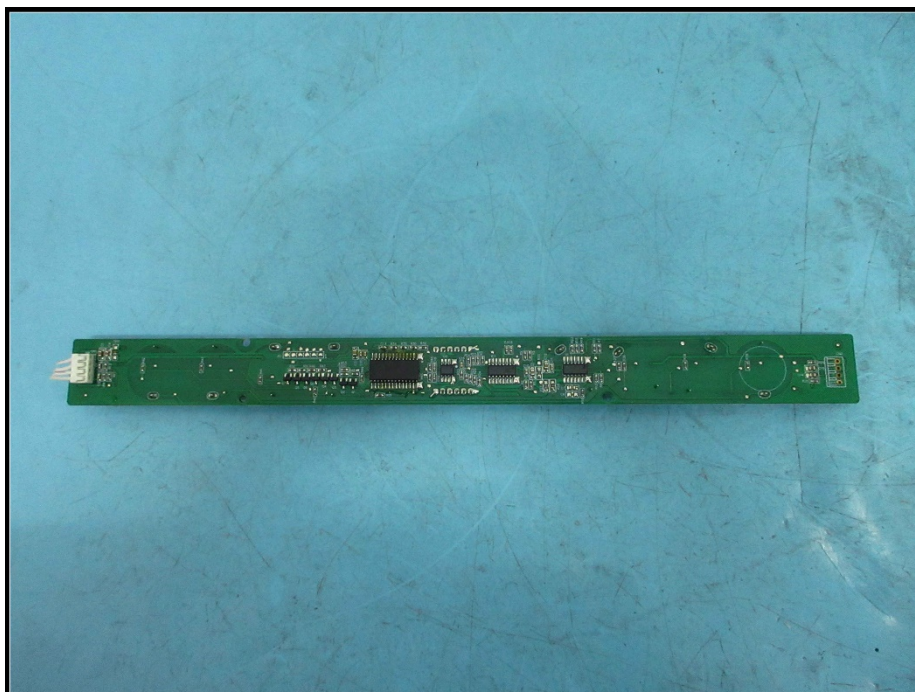




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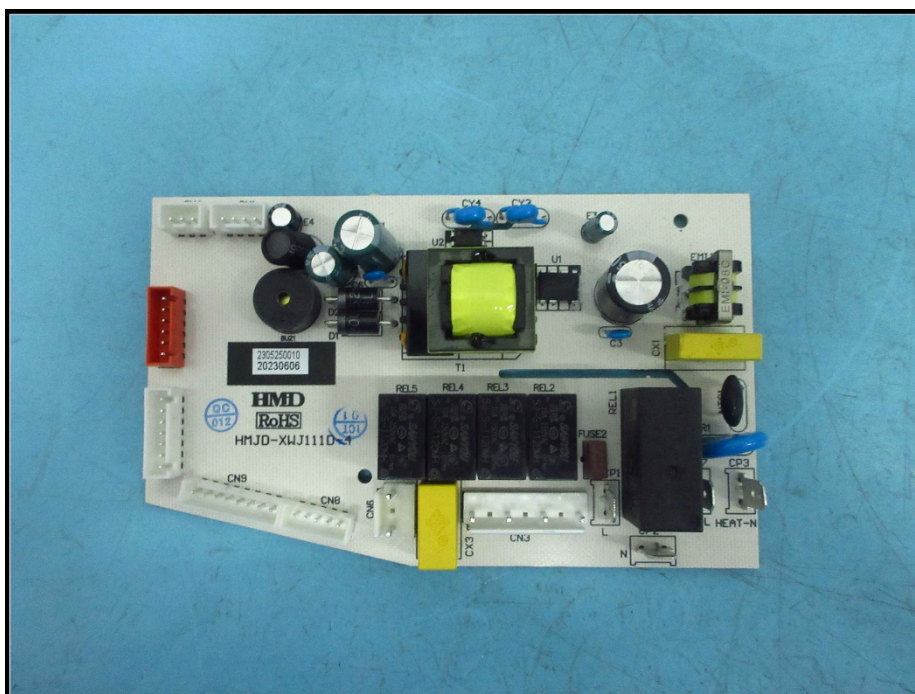
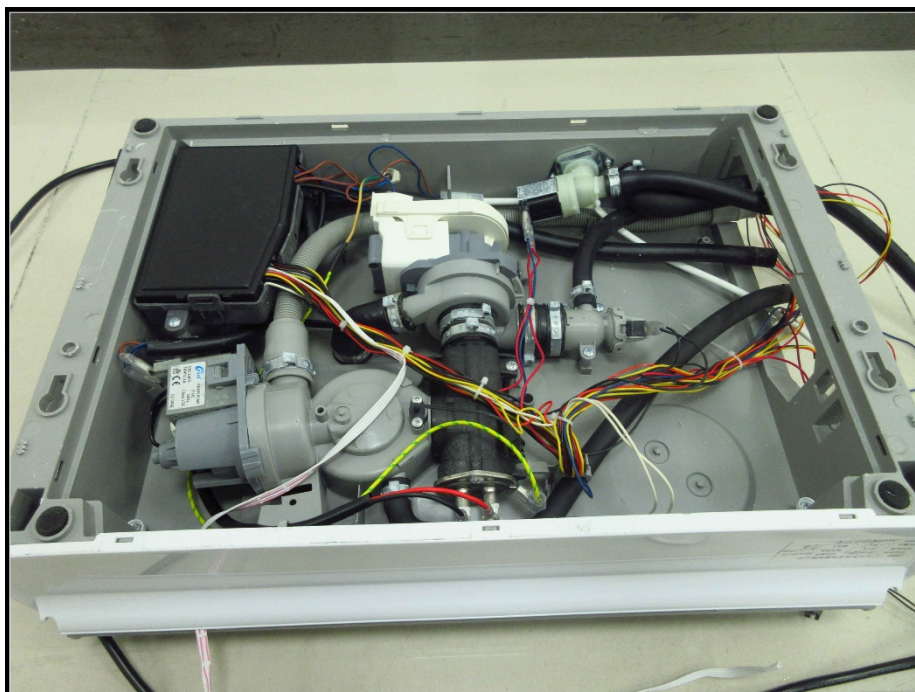


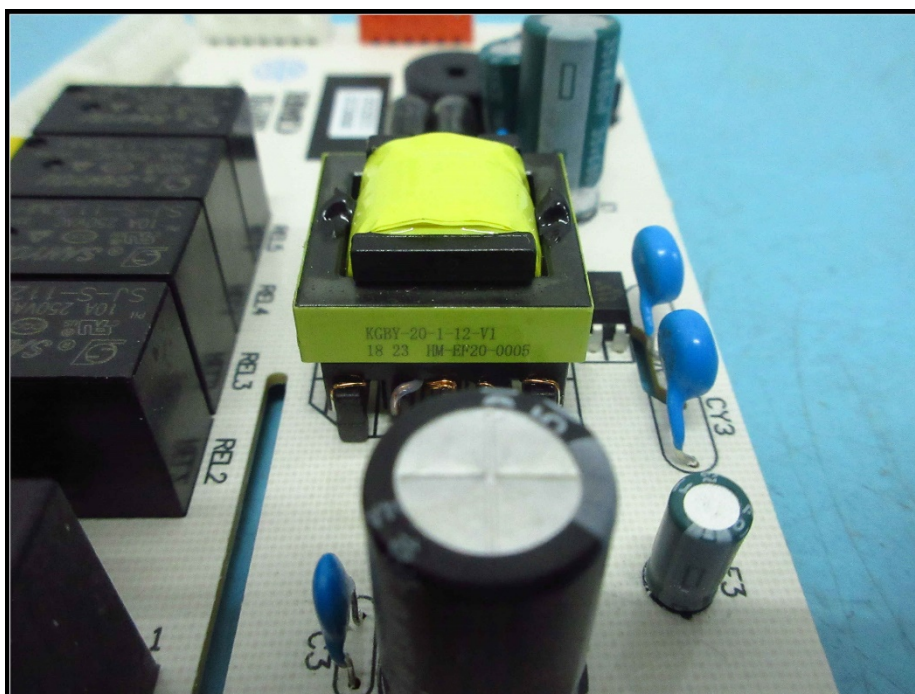
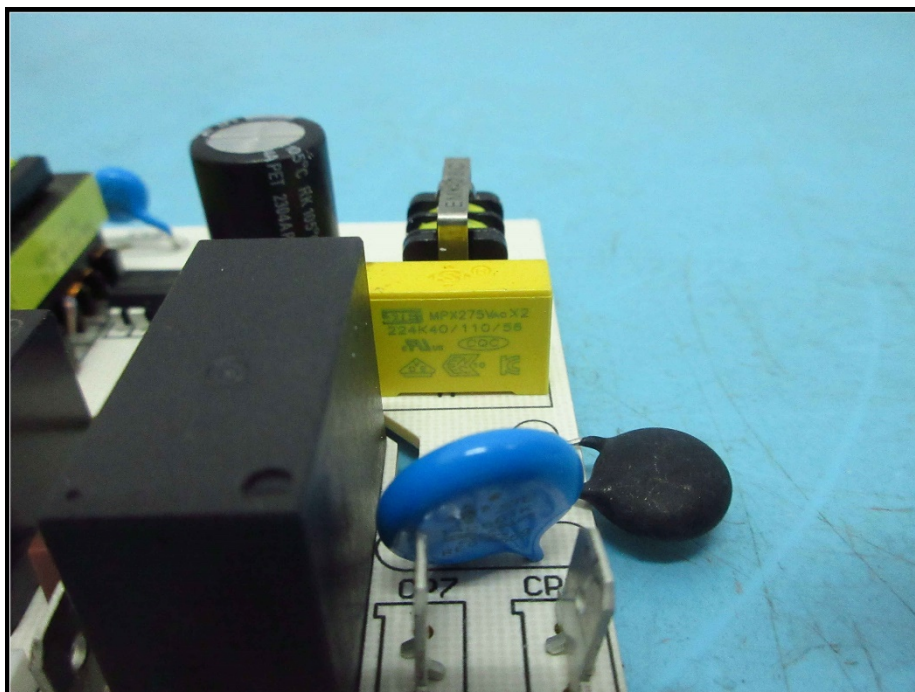
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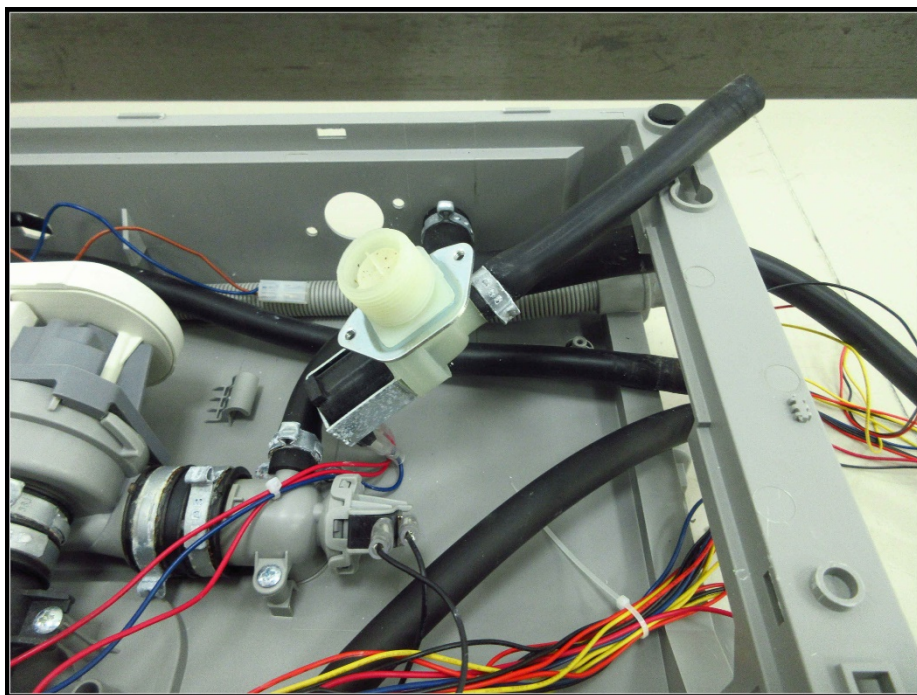
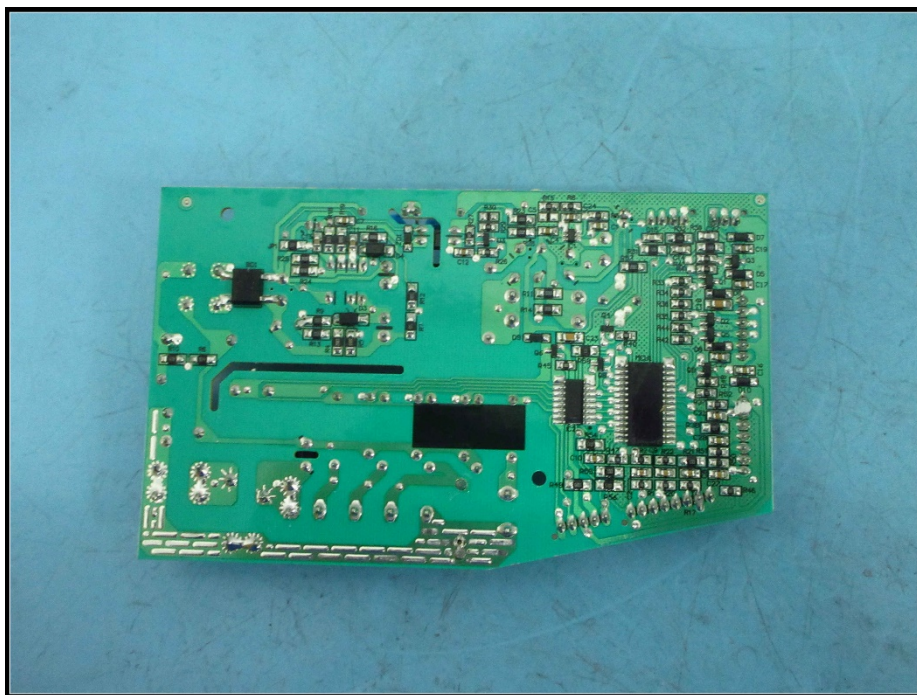


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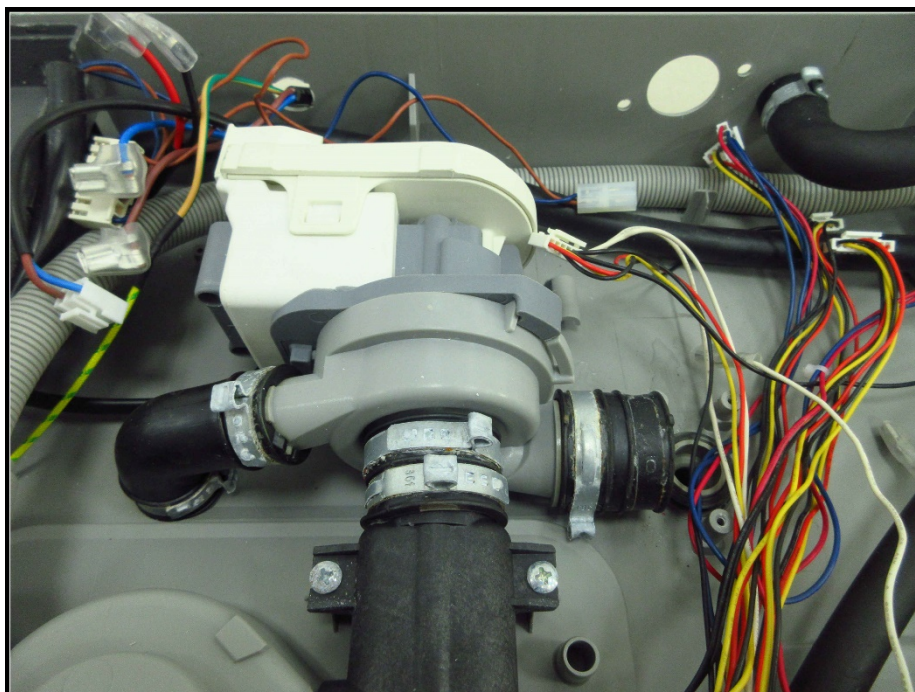


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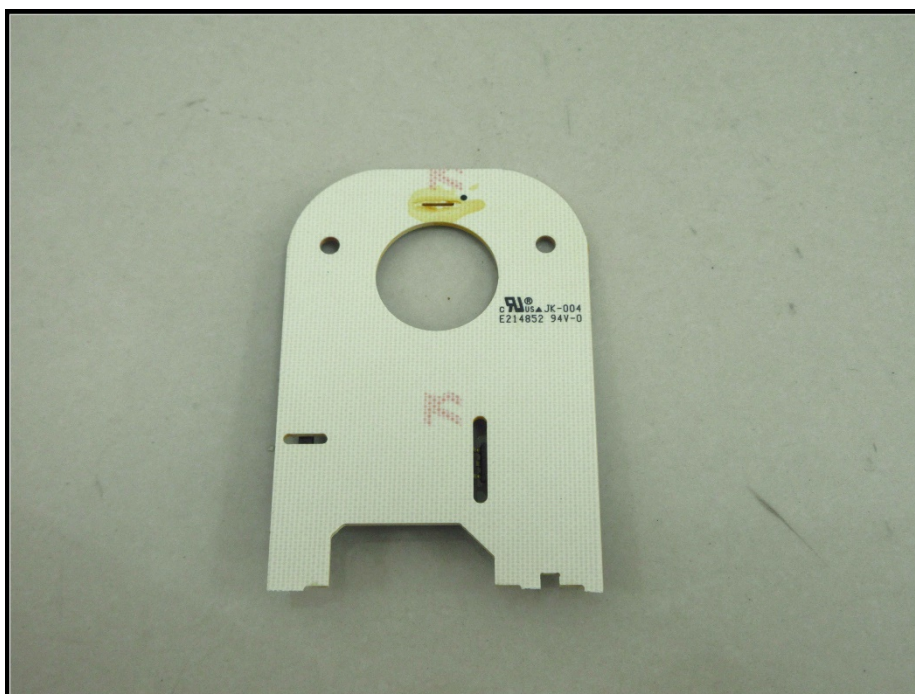
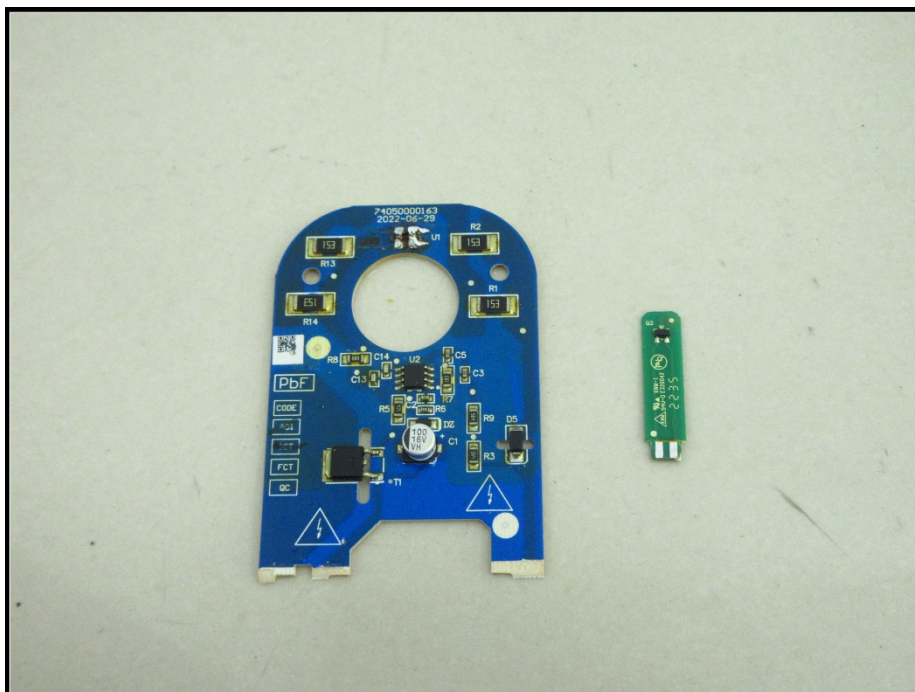


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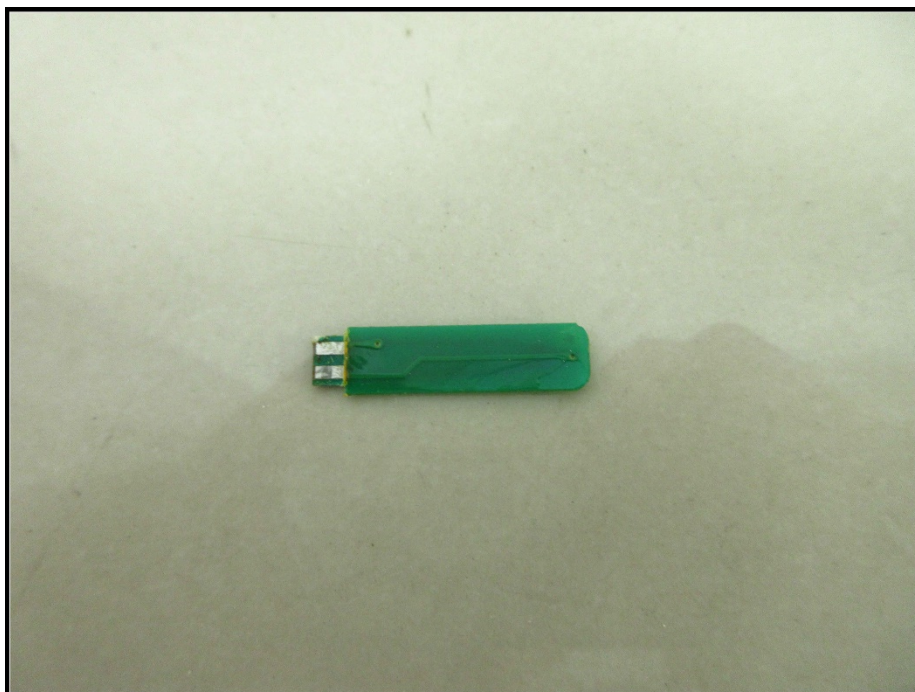
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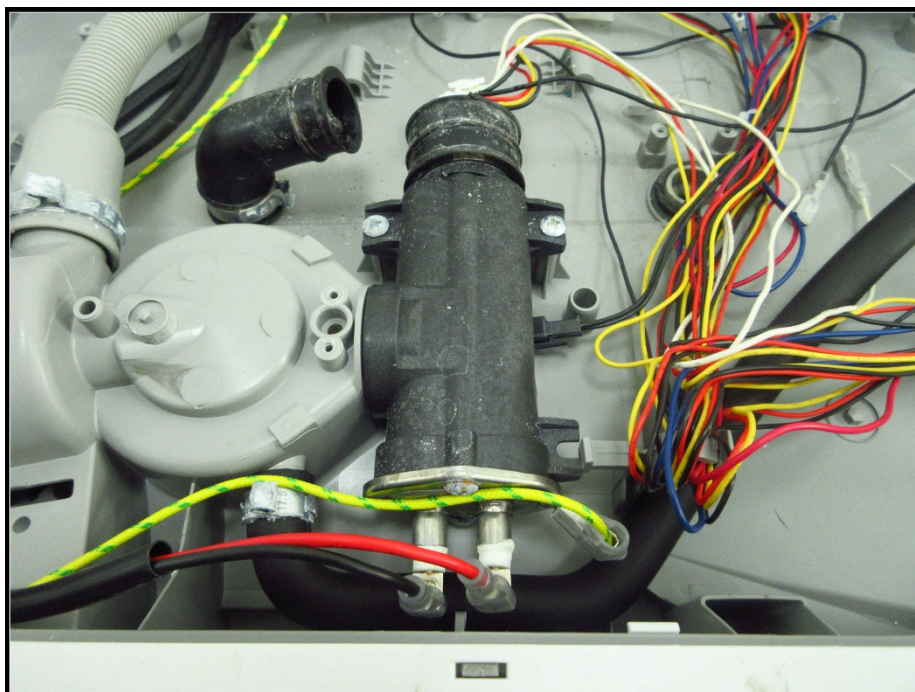
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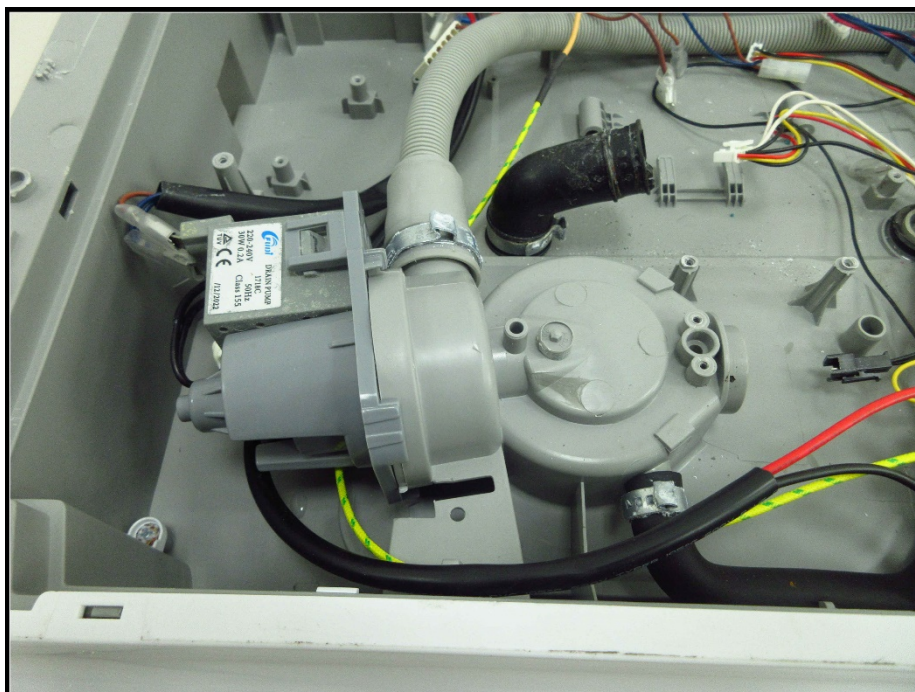
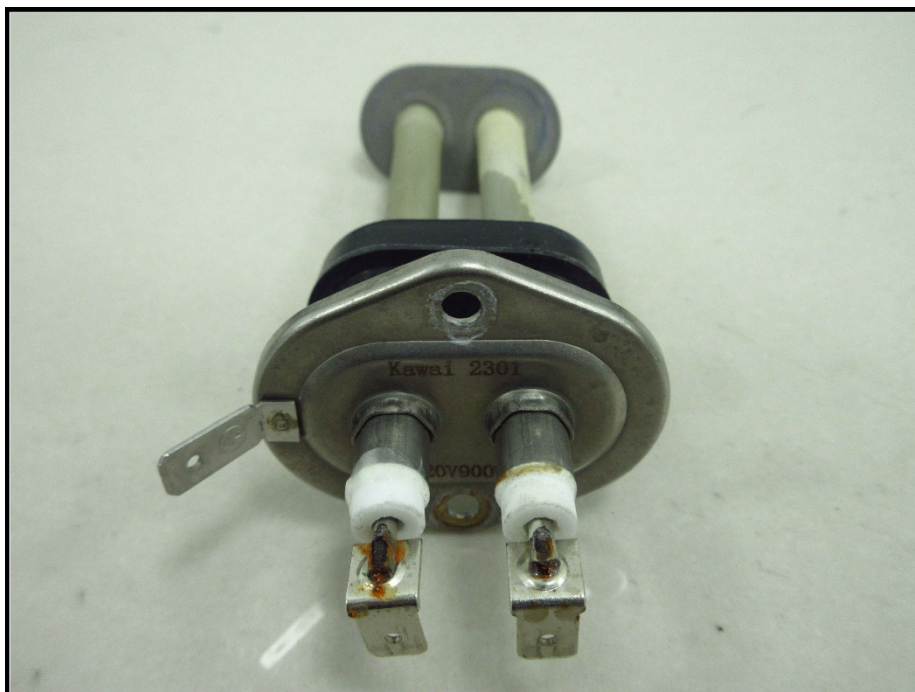
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- End of the Report -



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