

TEST REPORT

Product Name : Soldering Iron
EDL8860,
Model Number : EDL8830,
EDL88060,
EDL88035A

Prepared for : NINGBO DELI TOOLS CO., LTD.
Address : No. 128 Chezhan West Road, Huangtan Town, Ninghai
County, Ningbo, Zhejiang, China.

Prepared by : EMTEK (NINGBO) CO., LTD.
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Date of issue : March 13, 2024



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APPENDIX I (Photos of EUT) (4 Pages)

TEST REPORT DESCRIPTION

Applicant : NINGBO DELI TOOLS CO., LTD.
Manufacturer : NINGBO DELI INFORMATION TECHNOLOGY CO., LTD
Trade Mark : N/A
EUT : Soldering Iron
Model No. : EDL8860, EDL8830, EDL88060, EDL88035A
Power Supply : AC 220V, 50Hz, 60W

Measurement Procedure Used:

EN IEC 55014-1:2021
EN IEC 61000-3-2:2019/A1:2021
EN 61000-3-3:2013/A2:2021/AC:2022-01
EN IEC 55014-2:2021
(IEC 61000-4-2:2008, IEC 61000-4-3:2020, IEC 61000-4-4:2012, IEC 61000-4-5:2014/AMD1:2017,
IEC 61000-4-6:2013, IEC 61000-4-11:2020)

The device described above is tested by EMTEK (NINGBO) 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 (NINGBO) 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 55014-1, EN IEC 61000-3-2, EN 61000-3-3 and EN IEC 55014-2 requirements.

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

Date of Test : February 27, 2024 to March 05, 2024

Prepared by : 
June Gao/Engineer

Reviewer : 
Ade Wang/Supervisor

Approved & Authorized Signer : 
Tony Wei/Manager



Modified History

Version	Report No.	Revision date	Summary
	ENB2402270225E00401R	/	Original Report



1. SUMMARY OF TEST RESULT

EMISSION				
Description of Test Item		Standard	Limits	Results
Conducted Emissions at General Mains port		EN IEC 55014-1:2021	Table 5	Pass
Conducted Emissions at Mains Port for Motor Operated Tools		EN IEC 55014-1:2021	Table 6	N/A
Conducted Emissions at Mains Port for the AC Mains Port of Equipment With Active IPT Functions		EN IEC 55014-1:2021	Table 2	N/A
Conducted Emissions at Auxiliary Ports		EN IEC 55014-1:2021	Table 5	N/A
Click		EN IEC 55014-1:2021	Section 4.4.2	N/A
Disturbance Power		EN IEC 55014-1:2021	Table 7&8	Pass
Magnetic Field Strength at Equipment With Active IPT Functions		EN IEC 55014-1:2021	Table 3	N/A
Magnetic Field Induced Current at Equipment With Active IPT Functions		EN IEC 55014-1:2021	Table 4	N/A
Radiated Emission Up to 1 GHz		EN IEC 55014-1:2021	Table 9	N/A
Radiated Emission Above 1 GHz		EN IEC 55014-1:2021	Table 11	N/A
Harmonic Current Emission		EN IEC 61000-3-2:2019/A1:2021	Class A	Pass
Voltage Fluctuation And Flicker		EN 61000-3-3:2013/A2:2021/AC: 2022-01	Section 5	Pass
IMMUNITY (EN IEC 55014-2:2021, Category II)				
Description of Test Item		Basic Standard	Performance Criteria	Results
Electrostatic Discharge	Enclosure ports	IEC 61000-4-2:2008	B	Pass
Radio frequency electromagnetic fields	Enclosure ports	IEC 61000-4-3:2020	A	N/A
Electrical Fast Transient / Burst	Signal ports, control ports and wired network ports	IEC 61000-4-4:2012	B	N/A
	Input and output DC power ports			N/A
	Input and output AC power ports			Pass
Surge	Input AC power ports	IEC 61000-4-5:2014/AMD 1:2017	B	Pass
	wired network ports			N/A
Injected Current Susceptibility	Signal ports, control ports and wired network ports	IEC 61000-4-6:2013	A	N/A
	Input and output DC power ports			N/A
	Input and output AC power ports			Pass
Voltage Dips	Input AC power ports	IEC 61000-4-11:2020	C	Pass
Note: N/A is an abbreviation for Not Applicable.				

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Soldering Iron

Model Number : EDL8860, EDL8830, EDL88060, EDL88035A
(Note: All models are the same except except the model power and headform.
We prepared model EDL8860 for EMC test.)

Test Voltage : AC 220V/50Hz

Highest Frequency : Below 15 MHz

Sample number : ENB2402270225E004-1-1

Applicant : NINGBO DELI TOOLS CO., LTD.

Address : No. 128 Chezhan West Road, Huangtan Town, Ninghai County, Ningbo, Zhejiang, China.

Manufacturer : NINGBO DELI INFORMATION TECHNOLOGY CO., LTD

Address : Room 701-16, Building 1, No.111 Xinkai Road, Daxie Development Zone, Ningbo City, Zhejiang Province.

Date of Received : February 27, 2024

Date of Test : February 27, 2024 to March 05, 2024

2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
1	Enclosure	N/E	--	--	None
2	AC mains	AC	No	Unshielded	None

*Note: Use abbreviations:

AC= AC Power port

DC= DC Power port

N/E= Non-Electrical

A/D=Analogue/digital data port (signal/control port, antenna port, wired network port, broadcast receiver tuner port, optical fibre port)

2.3. Independent Operation Modes

A. Heating

2.4. Test Voltage and Frequency for EN IEC 55014-1& EN IEC 55014-2

During the tests, the EUT shall be operated at the rated voltage specified for the equipment.

For single-phase equipment with a rated voltage range in the range between:

- 100 V to 127 V, test at one nominal voltage within this range;
- 200 V to 240 V, test at one nominal voltage within this range;
- 100 V to 240 V, test at two voltages within this range, one test in the range 100 V to 127 V and another test in the range 200 V to 240 V.

The recommended test voltages are 120 V for the range 100 V to 127 V; and 230 V for the range 200 V to 240 V.

Note: The nominal voltages of mains supply networks are 100 V, 110 V, 115 V, 120 V, 127 V, 200 V, 208 V, 220V, 230 V and 240 V.

During the tests the EUT shall be operated at the rated frequency specified for the equipment.

If the equipment has more than one rated frequency (e.g. 50 Hz to 60 Hz), then the EUT shall be tested at one of these frequencies only.

If the equipment has a rated frequency range (e.g. 50 Hz to 60 Hz), then the EUT shall be tested at one frequency within this range

We prepared AC 220V/50Hz voltage for AC Mains equipment test.

2.5. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted Emissions at General Mains port	AC 220V/50Hz	Mode A	Mode A
Disturbance Power	AC 220V/50Hz	Mode A	Mode A
Harmonic Current Emission	AC 220V/50Hz	Mode A	Mode A
Voltage Fluctuation And Flicker	AC 220V/50Hz	Mode A	Mode A
Electrostatic Discharge	AC 220V/50Hz	Mode A	Mode A
EFT/B	AC 220V/50Hz	Mode A	Mode A
Surge	AC 220V/50Hz	Mode A	Mode A
Injected Current Susceptibility	AC 220V/50Hz	Mode A	Mode A
Voltage Dips	AC 220V/50Hz	Mode A	Mode A

2.6. Description of Test Facility

Site Description
EMC Lab.

: **Accredited by CNAS**

The Certificate Registration Number is L6666.

The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Designation by FCC

Designation Number: CN1354

Test Firm Registration Number: 427606

Accredited by A2LA

The Certificate Number is 4321.03.

The certificate is valid until May 31, 2025

Designation by Industry Canada

The Conformity Assessment Body Identifier is CN0114

Name of Firm : EMTEK (NINGBO) CO., LTD.

Site Location : No. 8, Building 8, Lane 216, Qingyi Road, Hi-Tech Zone, Ningbo, Zhejiang,
China

2.7. Support Device

N/A

2.8. Test Software

Item	Software
Conducted Emission	: JSDEMC-EMI(V 3.3)
Disturbance Power	: JSDEMC-EMI(V 3.3)

2.9. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 2.08dB (9 k-150 kHz) 2.40dB (150 k-30 MHz)
Power Clamp Uncertainty	: 4.34dB
Uncertainty for Harmonic test	: 4.16% mA
Uncertainty for Flicker test	: 0.43% V
Uncertainty for ESD Test	: 6.00% kV
Uncertainty for EFT/B Test	: 3.84% kV
Uncertainty for Surge Test	: 0.53% kV
Uncertainty for C/S Test	: 1.45dB(Using CDN Test)
Uncertainty for DIPS Test	: 2.12% V

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emissions at Mains Measurement

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-002	EMI Test Receiver	R & S	ESCI	101107	July 06, 2023	1 Year
ENE-158	L.I.S.N	Schwarzbeck	NNLK 8129	0373	Nov 17, 2023	1 Year
ENE-004	L.I.S.N	Schwarzbeck	NSLK 8126	8126-462	July 06, 2023	1 Year
ENE-162-1	RF Cable	TIMES	2M(N-N)	605236-0001	May 31, 2023	1 Year
ENE-070	Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00525	Mar 15, 2023	1 Year
ENE-150	Conduction Test Room 2#	SKET	6.5*5*4m	/	Apr 17, 2023	3 Year

3.2. For Disturbance Power Measurement

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-001	EMI Test Receiver	R & S	ESCI	101108	Dec 14, 2023	1 Year
ENE-007	Absorbing Clamp	R & S	MDS21	100397	July 06, 2023	1 Year
ENE-008	Coaxial attenuator	R & S	MDS21	100397	July 06, 2023	1 Year
ENE-278	RF Switching Unit	HTEC	HRSU	222101	July 06, 2023	1 Year
ENE-165-2	RF Cable	TIMES	10M (N-N)	605239-0003	May 31, 2023	1 Year
ENE-162-2	RF Cable	TIMES	2M(N-N)	605236-0002	May 31, 2023	1 Year
ENE-149	Conduction Test Room 1#	SKET	11.5*5*4m	/	Dec 17, 2021	3 Year

3.3. For Harmonic Current / Voltage Fluctuation And Flicker Measurement

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-157	Harmonic/ flicker analyzer	PACIFIC	ECTS2-3300Z-M 18012	550128	Nov 17, 2023	1 Year
ENE-157-1	AC Power source	PACIFIC	330AZX-CE	140250014	Nov 17, 2023	1 Year

3.4. For Electrostatic Discharge Immunity Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-139	ESD Tester	TESEQ	NSG 437	1732	Nov 17, 2023	1 Year
ENE-152	ESD test Room	SKET	5.5*4*3m	/	Apr 18, 2023	3 Year

3.5. For Electrical Fast Transient / Burst Immunity Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-011	Burst Tester	HAEFELY	PEFT4010	173964	July 06, 2023	1 Year
ENE-012	Coupling Clamp	HAEFELY	IP-4A	147399	July 06, 2023	1 Year
ENE-168	Coupling and Decoupling Network Three Phase	HAEFELY	FP-EFT 32M	190170	Dec 14, 2023	1 Year

3.6. For Surge Immunity Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-097-1	Combination Wave Generator	HTEC	HCWG 100	204303	Nov 17, 2023	1 Year
ENE-097-2	Three Phase Coupling/Decoupling Network	HTEC	HCOUPLER 30S	204103	Nov 17, 2023	1 Year
ENE-097-3	High Pressure Option	HTEC	Options-10KDC	/	Nov 17, 2023	1 Year
ENE-097-4	40 ohm Impedance	HTEC	Options-40ohm	/	Nov 17, 2023	1 Year
ENE-097-5	10 ohm Impedance	HTEC	Options-10ohm	/	Nov 17, 2023	1 Year
ENE-097-6	Combination Wave Generator	HTEC	HTSG 70	204304	Nov 17, 2023	1 Year
ENE-097-7	Coupling Network	HTEC	HCN 8	204901	Nov 17, 2023	1 Year
ENE-097-8	Decoupling Network	HTEC	HDEC 8	204902	Nov 17, 2023	1 Year
ENE-097-9	Isolated Power Supply	HTEC	SBK-30KVA	/	Nov 17, 2023	1 Year

3.7. For Injected Current Susceptibility Immunity Test

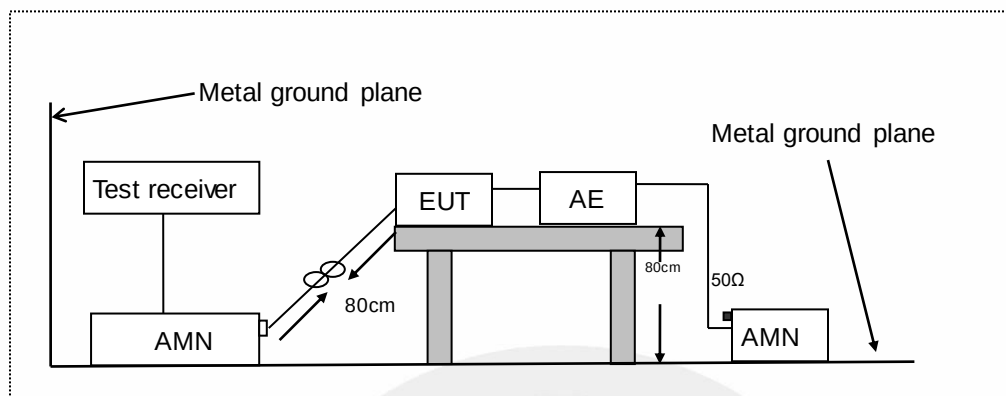
Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-057	Simulator	SCHLODER	CDG-6000-75	126B1404/2016	July 06, 2023	1 Year
ENE-058	CDN	SCHLODER	CDN-M2+3	A2210415/2016	July 06, 2023	1 Year
ENE-056	Attenuator	SCHLODER	6dB 100W	HA1615	July 06, 2023	1 Year
ENE-098	Current Injection Probe	SCHLODER	CDN BCI-P1	19102314-0101	Nov 17, 2023	1 Year
ENE-099	EM-clamp	SCHLODER	CDN EMCL-20	20102817-0103	Nov 17, 2023	1 Year
ENE-160	Three phase CDN	SCHLODER	CDN M3-L32 HV	10749-1	Nov 17, 2023	1 Year
ENE-160-1	Three phase CDN	SCHLODER	CDN M5-N32 HV	10751-1	Nov 17, 2023	1 Year
ENE-160-2	Three phase CDN	SCHLODER	CDN M4-32 HV	10750-1	Nov 17, 2023	1 Year
ENE-160-3	Three phase CDN	SCHLODER	CDN M4-32A	10982-1	Apr 28, 2023	1 Year

3.8. For Voltage Dips Immunity Test

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-055	Dips Tester	HTEC	HPFS161P	164901	July 06, 2023	1 Year
ENE-055	AC Power source	HTEC	HV1P16T	164902	July 06, 2023	1 Year

4. CONDUCTED EMISSIONS AT MAINS MEASUREMENT

4.1. Block Diagram of Test Setup



AMN: Artificial mains network
AE: Associated equipment
EUT: Equipment under test

4.2. Measurement Standard

EN IEC 55014-1:2021

4.3. Measurement Limits

☒ General Mains port

Frequency range MHz	Quasi-peak dBuV	Average dBuV
0.15 to 0.50	66 to 56*	59 to 46*
0.50 to 5	56	46
5 to 30	60	50

The lower limit applies at the transition frequencies.
*: Decreasing linearly with logarithm of frequency from

☐ Motor Operated Tools

Frequency range	☐ $P \leq 700W$		☐ $700W < P \leq 1000W$		☐ $P > 1000W$	
MHz	Quasi-peak dBuV	Average dBuV	Quasi-peak dBuV	Average dBuV	Quasi-peak dBuV	Average dBuV
0.15 to 0.35	66 to 59*	59 to 49*	70 to 63*	63 to 53*	76 to 69*	69 to 59*
0.35 to 5	59	49	63	53	69	59
5 to 30	64	54	68	58	74	64

The lower limit applies at the transition frequencies.
*: Decreasing linearly with logarithm of frequency from
Key: P = rated power of the motor only.

☐ AC Mains Port of Equipment With Active IPT Functions

Frequency range	☐ Appliances which are 100 V rated and without ban earth connection		☐ All other appliances	
MHz	dBuV Quasi-peak	dBuV Average	dBuV Quasi-peak	dBuV Average
0,009 to 0,050	122	-	110	-
0.050 to 0.150	102 to 92*	-	90 to 80*	-
0.150 to 0.5	72 to 62*	62 to 52*	66 to 56*	56 to 46*
0,5 to 5	56	46	56	46
5 to 30	60	50	60	50
The lower limit applies at the transition frequencies. *: Decreasing linearly with logarithm of frequency from				

4.4. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a artificial mains network (AMN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other AMN.

The AMN provides 50 ohm coupling impedance for the measuring instrument.

The CISPR states that the AMN with 50 ohm and 50 microhenry should be used.

Both sides of AC line were checked for maximum conducted interference.

For frequency band 9 kHz to 150 kHz, the bandwidth of the test receiver is set at 200 Hz. For frequency band 150 kHz to 30 MHz, the bandwidth is set at 9 kHz. The frequency range from 9 kHz or 150 kHz to 30 MHz is investigated.

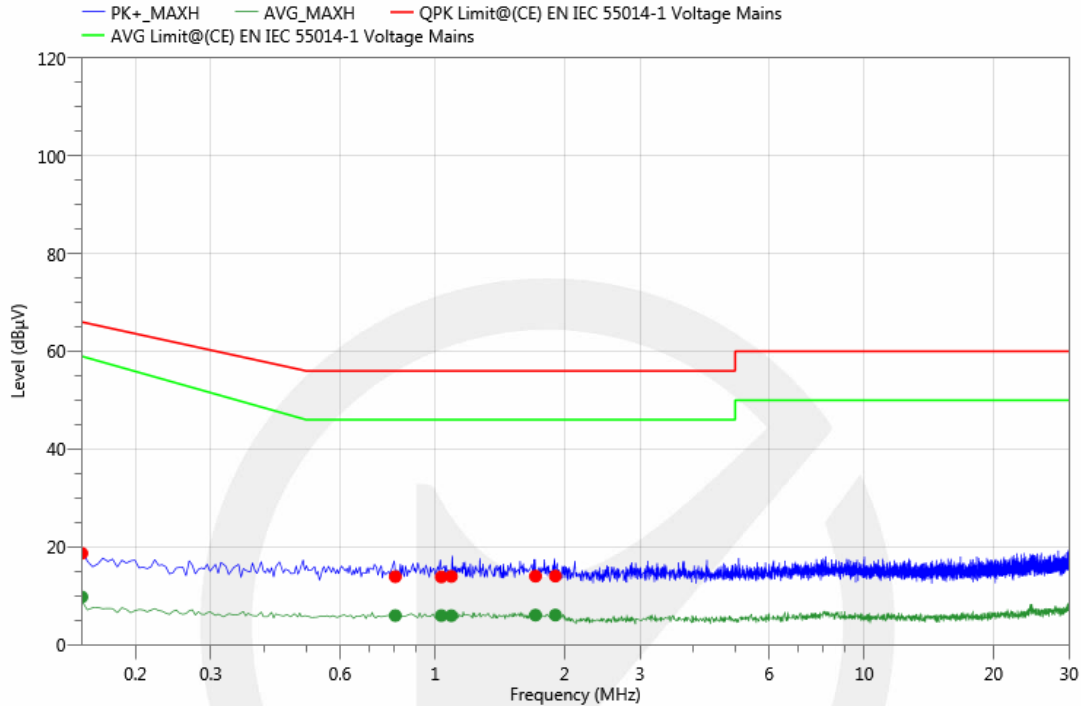
Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

4.5. Measuring Results

Pass.

Please refer to the following pages.

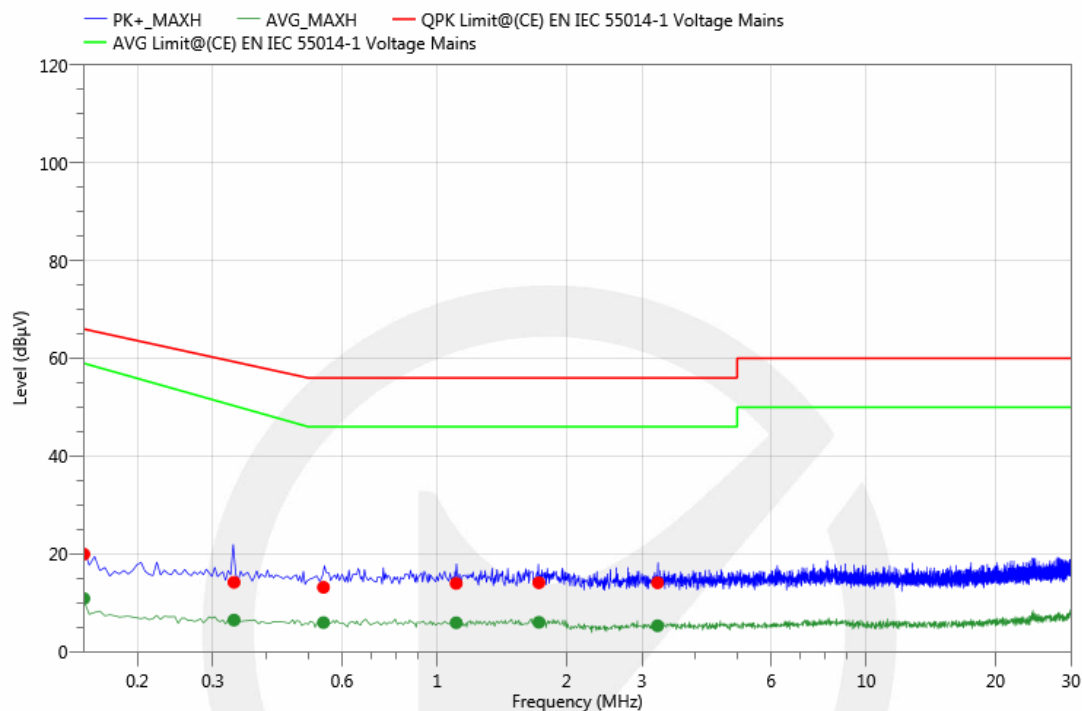
Project Information			
Model :	EDL8860	Mode :	Heating
Voltage :	AC 220V/50Hz	Engineer :	WK Luo
Temp :	20°C	Humi :	37%



Final Result (Margin=Limit-Meas.(Reading + Corr.))

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.150	8.37	10.3	18.67	66.00	47.33	QPK	N	GND	Pass
2	0.150	-0.57	10.3	9.73	59.00	49.27	AVG	N	GND	Pass
3	0.807	3.51	10.37	13.88	56.00	42.12	QPK	N	GND	Pass
4	0.807	-4.45	10.37	5.92	46.00	40.08	AVG	N	GND	Pass
5	1.033	3.42	10.41	13.83	56.00	42.17	QPK	N	GND	Pass
6	1.033	-4.49	10.41	5.92	46.00	40.08	AVG	N	GND	Pass
7	1.090	3.51	10.42	13.93	56.00	42.07	QPK	N	GND	Pass
8	1.090	-4.52	10.42	5.90	46.00	40.10	AVG	N	GND	Pass
9	1.712	3.51	10.47	13.98	56.00	42.02	QPK	N	GND	Pass
10	1.712	-4.46	10.47	6.01	46.00	39.99	AVG	N	GND	Pass
11	1.905	3.51	10.49	14.00	56.00	42.00	QPK	N	GND	Pass
12	1.905	-4.47	10.49	6.02	46.00	39.98	AVG	N	GND	Pass

Project Information			
Model :	EDL8860	Mode :	Heating
Voltage :	AC 220V/50Hz	Engineer :	WK Luo
Temp :	20°C	Humi :	37%

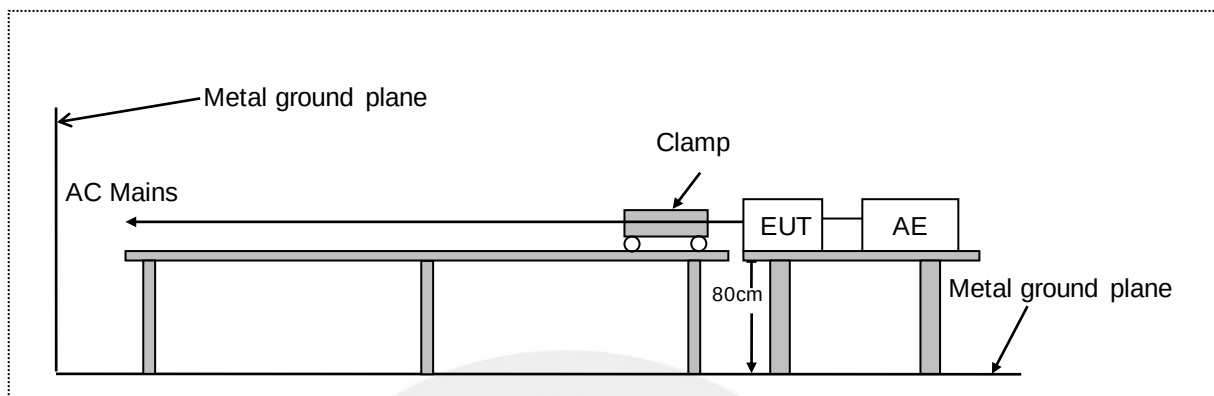


Final Result (Margin=Limit-Meas.(Reading + Corr.))

No.	Freq. (MHz)	Reading (dBμV)	Corr. (dB)	Meas. (dBμV)	Limit (dBμV)	Margin (dB)	Det.	Line	PE	Verdict
1	0.150	9.67	10.25	19.92	66.00	46.08	QPK	L1	GND	Pass
2	0.150	0.58	10.25	10.83	59.00	48.17	AVG	L1	GND	Pass
3	0.336	3.75	10.41	14.16	59.30	45.14	QPK	L1	GND	Pass
4	0.336	-3.98	10.41	6.43	50.29	43.86	AVG	L1	GND	Pass
5	0.543	2.81	10.32	13.13	56.00	42.87	QPK	L1	GND	Pass
6	0.543	-4.40	10.32	5.92	46.00	40.08	AVG	L1	GND	Pass
7	1.107	3.51	10.42	13.93	56.00	42.07	QPK	L1	GND	Pass
8	1.107	-4.53	10.42	5.89	46.00	40.11	AVG	L1	GND	Pass
9	1.725	3.60	10.48	14.08	56.00	41.92	QPK	L1	GND	Pass
10	1.725	-4.50	10.48	5.98	46.00	40.02	AVG	L1	GND	Pass
11	3.261	3.38	10.69	14.07	56.00	41.93	QPK	L1	GND	Pass
12	3.261	-5.42	10.69	5.27	46.00	40.73	AVG	L1	GND	Pass

5. DISTURBANCE POWER MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. Measurement Standard

EN IEC 55014-1:2021

5.3. Measurement Limits

All emanations from devices or system shall not exceed the level of field strengths specified below:

5.3.1.Limits (Table 7 of standard EN IEC 55014-1)

Frequency range	☒ General		Tools					
			☐ $P \leq 700W$		☐ $700W < P \leq 1000W$		☐ $P > 1000W$	
MHz	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW
30 to 300	45 to 55*	35 to 45*	45 to 55*	35 to 45*	49 to 59*	39 to 49*	55 to 65*	45 to 55*

The lower limit applies at the transition frequencies.
*: Decreasing linearly with logarithm of frequency from
Key: P = rated power of the motor only.

5.3.2.Margin when performing disturbance power measurement (Table 8 of standard EN IEC 55014-1)

Frequency range	☒ General		Tools					
			☐ $P \leq 700W$		☐ $700W < P \leq 1000W$		☐ $P > 1000W$	
MHz	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW	Quasi-peak dBpW	Average dBpW
30 to 300	0 to 10*	0	0 to 10*	0	0 to 10*	0	0 to 10*	0

The lower limit applies at the transition frequencies.
*: Decreasing linearly with logarithm of frequency from
Key: P = rated power of the motor only.
Note: This table only applies if method a) specified in 4.3.4.2 is followed.

5.4. Test Procedure

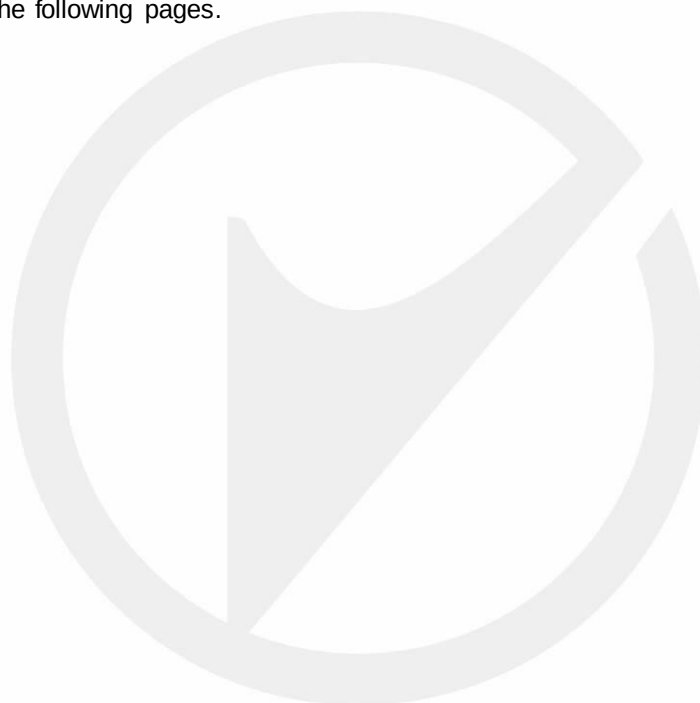
The EUT are placed on an insulating support 0.8 m high above a ground reference plane and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

The bandwidth of the receiver is set at 120 kHz in 30 MHz to 300 MHz. The frequency range from 30 MHz to 300 MHz is investigated.

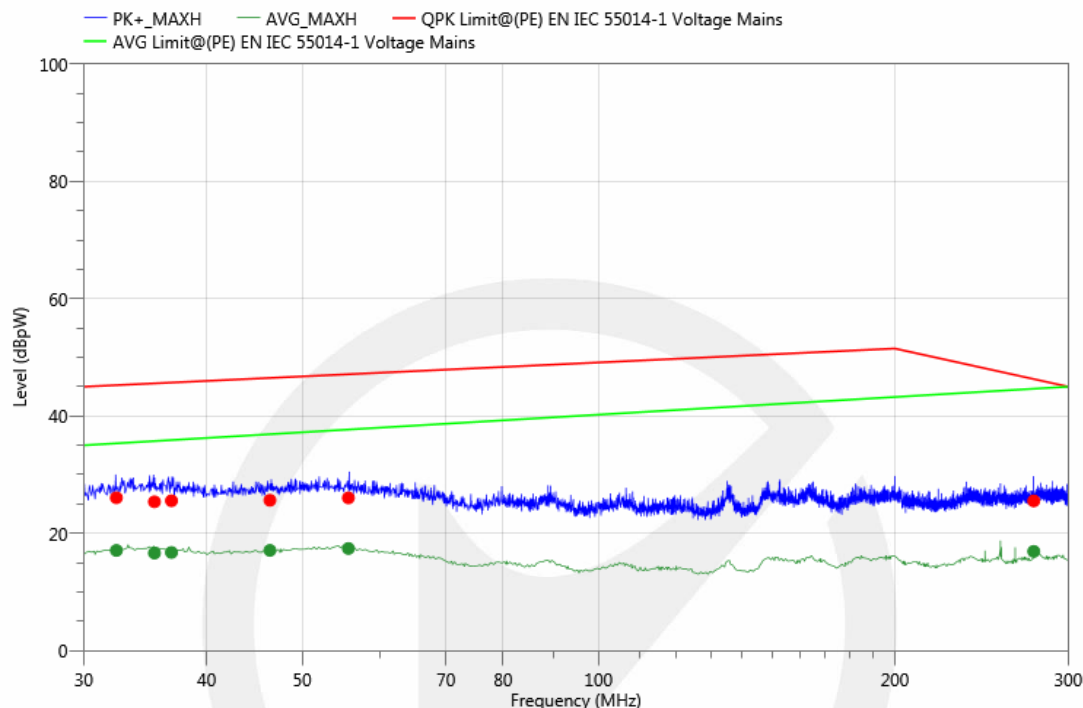
5.5. Test Results

Pass.

Please refer to the following pages.



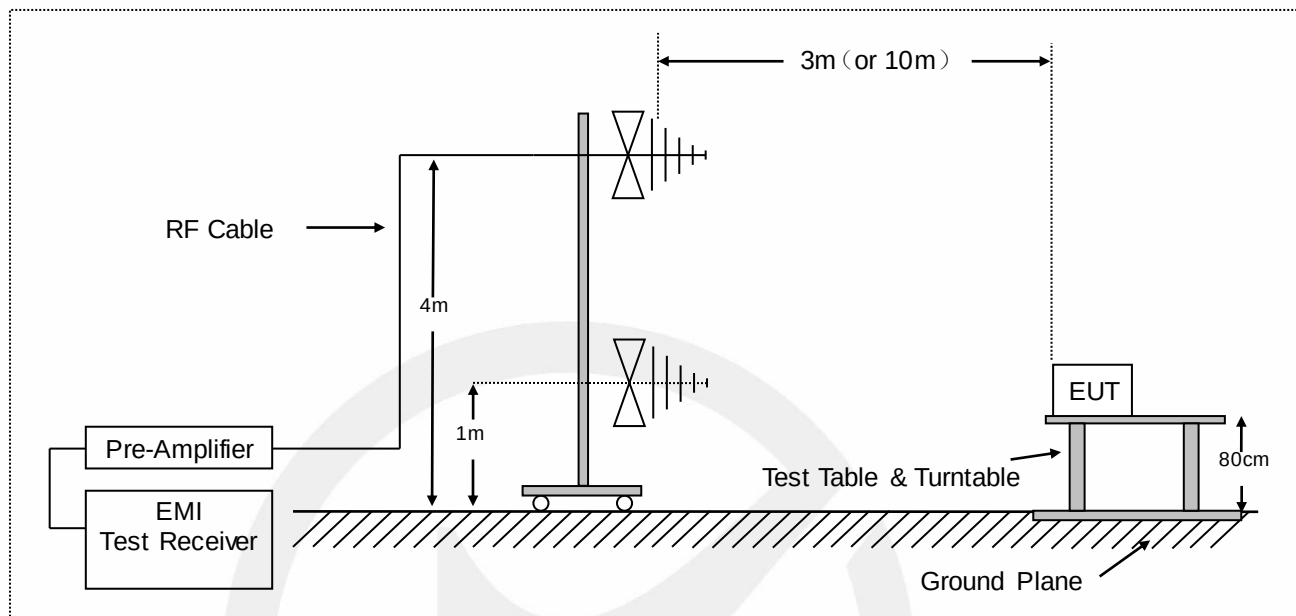
Project Information			
Model :	EDL8860	Mode :	Heating
Voltage :	AC 220V/50Hz	Engineer :	WK Luo
Temp :	17°C	Humi :	45%



Final Result (Margin=Limit-Meas.(Reading + Corr.))								
No.	Freq. (MHz)	Reading (dBpW)	Corr. (dB)	Meas. (dBpW)	Limit (dBpW)	Margin (dB)	Det.	Verdict
1	32.379	16.60	9.45	26.05	45.26	19.21	QPK	Pass
2	32.379	7.62	9.45	17.07	35.33	18.26	AVG	Pass
3	35.395	15.50	9.86	25.36	45.57	20.21	QPK	Pass
4	35.395	6.76	9.86	16.62	35.72	19.10	AVG	Pass
5	36.833	15.94	9.6	25.54	45.70	20.16	QPK	Pass
6	36.833	7.12	9.6	16.72	35.89	19.17	AVG	Pass
7	46.368	16.26	9.36	25.62	46.49	20.87	QPK	Pass
8	46.368	7.72	9.36	17.08	36.89	19.81	AVG	Pass
9	55.714	16.40	9.63	26.03	47.12	21.09	QPK	Pass
10	55.714	7.77	9.63	17.40	37.69	20.29	AVG	Pass
11	276.748	17.37	8.15	25.52	46.29	20.77	QPK	Pass
12	276.748	8.75	8.15	16.90	44.65	27.75	AVG	Pass

6. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

6.1. Block Diagram of Test Setup



6.2. Measuring Standard

EN IEC 55014-1:2021

6.3. Measurement Limits

Frequency range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance (m)	Detector type / bandwidth	
30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
230 to 1 000				37
30 to 230	OATS/SAC	3		40
230 to 1 000				47

Note: (1) The lower limit is applies at the transition frequency.

(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

6.4. 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 or 10 meters away from the receiving antenna that is mounted on an 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 120 kHz. The frequency range from 30 MHz to 1000 MHz is investigated.

6.5. Measuring Results

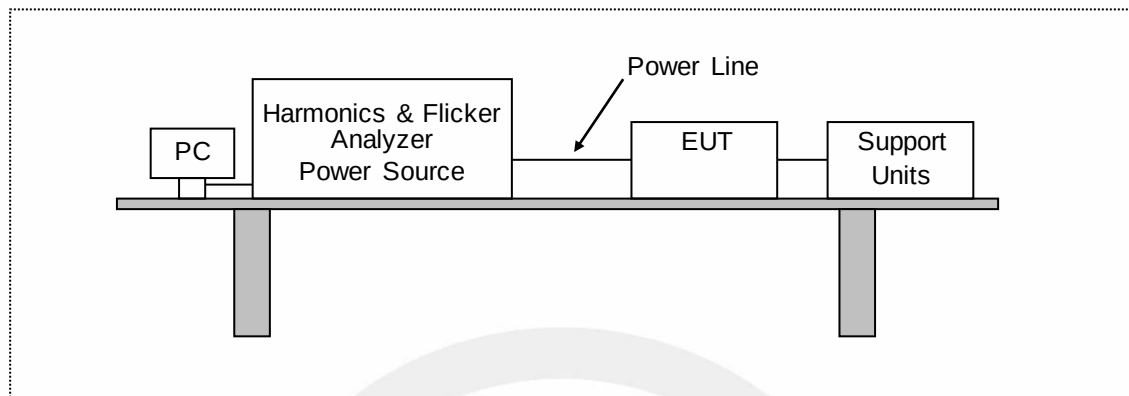
N/A.

For the test data of disturbance power is lower than the applicable limits (Table 7) reduced by the margin (Table 8), and the maximum clock frequency is less than 30 MHz, so the radiated measurements in the frequency range from 300 MHz to 1000 MHz is unnecessary to test.



7. HARMONIC CURRENT EMISSION MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Measuring Standard

EN IEC 61000-3-2:2019/A1:2021, Class A

7.3. Measurement Limits

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
$8 \leq n \leq 40$	$0.23 \frac{8}{n}$

7.4. 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 cycle ≤ 2.5 min). Because of synchronisation to meet the requirements for repeatability in 5%.

7.5. Test Results

Pass.

Please refer to the following pages.

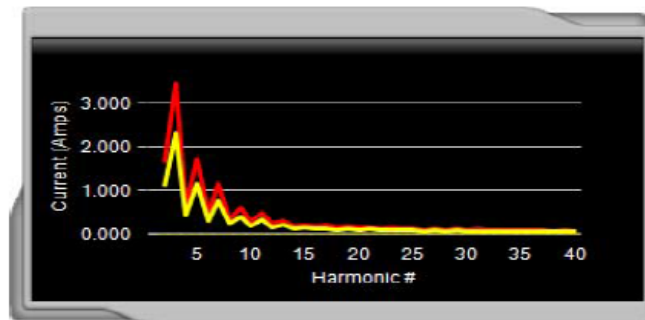


EUT: Soldering Iron 60W (EDL8860)
 Test Standard: Test per IEC 61000-3-2
 Test Class: (Class A Test) - No inter-harmonics
 Test Result: **PASS**
 Test Date: 2024/3/1
 Start Time: 15:33:46
 Stop Time: 15:36:29
 Test Duration (min): 2.5
Source Qualification: Compliance with IEC 61000-3-2
 Power Source Distortion: **OK**
 Temp (°C) : 22.0
 Hum. (% RH) : 31.0
 Customer: Customer
 Test By: Jackson Xue
 Comments: Heating

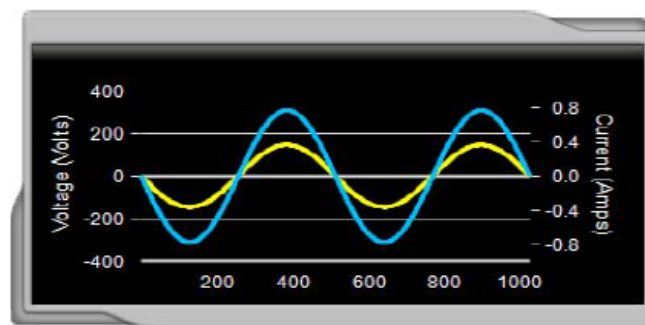
General Test Data: (Phase A)

Vrms (Volts)/V-pk/V-CF:	219.27 / 311.2 / 1.420	Frequency (Hz):	50.0001
I _{rms} (Amps):	0.257	Power (VA)/VAR:	56.43 / 0.66
I _{fund} /I _{ref} (Amps):	0.257 / 0.260	Power (W):	56.43
I _{peak} (Amps)/I-CF:	0.374 / 1.432	Power Factor:	1.000
V-THD (%):	0.05	I-THD (%):	0.14
POHC (A):	0.000 (method C.3)	POHC Limit (A):	0.250
I-THC (A):	0.000	Meas. Pwr (Min / Max)	56.05W/57.00W
Phase angle of H5 (deg):	141.90		

Harmonic Spectrum



Voltage & Current Waveform



Current Harmonics (values at the end of test)

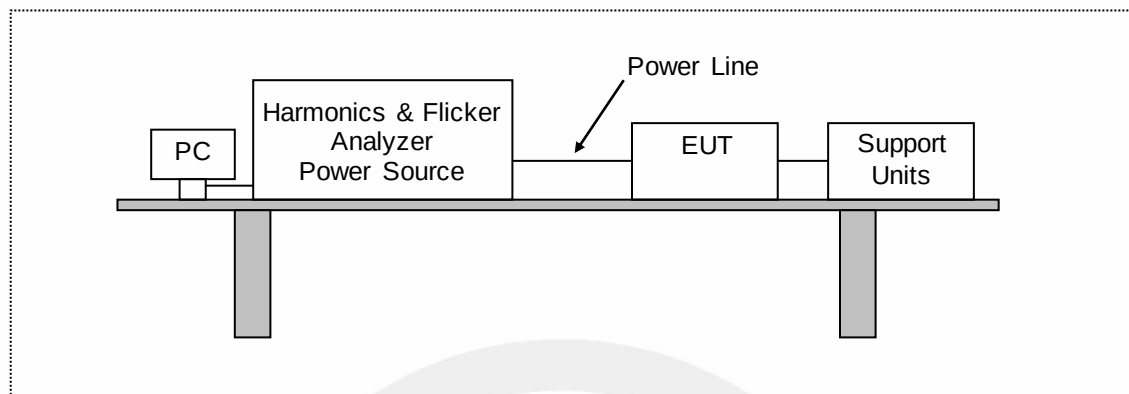
Harm No.	Harm. Ave.	Limit (100%)	% Of Limits	Result (Ave.)	Result (Max.)	Harm. Win.	Win. (150%)	% Of Max
2	0.0001	1.0800	0.0	PASS	PASS	0.0001	1.6200	0.0
3	0.0002	2.3000	0.0	PASS	PASS	0.0003	3.4500	0.0
4	0.0000	0.4300	0.0	PASS	PASS	0.0000	0.6450	0.0
5	0.0001	1.1400	0.0	PASS	PASS	0.0001	1.7100	0.0
6	0.0000	0.3000	0.0	PASS	PASS	0.0000	0.4500	0.0
7	0.0001	0.7700	0.0	PASS	PASS	0.0001	1.1550	0.0
8	0.0001	0.2300	0.0	PASS	PASS	0.0001	0.3450	0.0
9	0.0001	0.4000	0.0	PASS	PASS	0.0001	0.6000	0.0
10	0.0001	0.1840	0.0	PASS	PASS	0.0001	0.2760	0.0
11	0.0000	0.3300	0.0	PASS	PASS	0.0000	0.4950	0.0
12	0.0000	0.1530	0.0	PASS	PASS	0.0000	0.2295	0.0
13	0.0000	0.2100	0.0	PASS	PASS	0.0000	0.3150	0.0
14	0.0000	0.1310	0.0	PASS	PASS	0.0000	0.1965	0.0
15	0.0000	0.1500	0.0	PASS	PASS	0.0000	0.2250	0.0
16	0.0000	0.1150	0.0	PASS	PASS	0.0001	0.1725	0.0
17	0.0000	0.1320	0.0	PASS	PASS	0.0000	0.1980	0.0
18	0.0000	0.1020	0.0	PASS	PASS	0.0000	0.1530	0.0
19	0.0000	0.1180	0.0	PASS	PASS	0.0000	0.1770	0.0
20	0.0000	0.0920	0.0	PASS	PASS	0.0000	0.1380	0.0
21	0.0000	0.1070	0.0	PASS	PASS	0.0000	0.1605	0.0
22	0.0000	0.0830	0.0	PASS	PASS	0.0000	0.1245	0.0
23	0.0000	0.0970	0.0	PASS	PASS	0.0000	0.1455	0.0
24	0.0000	0.0760	0.0	PASS	PASS	0.0000	0.1140	0.0
25	0.0000	0.0900	0.0	PASS	PASS	0.0000	0.1350	0.0
26	0.0000	0.0700	0.0	PASS	PASS	0.0000	0.1050	0.0
27	0.0000	0.0830	0.0	PASS	PASS	0.0000	0.1245	0.0
28	0.0000	0.0650	0.0	PASS	PASS	0.0000	0.0975	0.0
29	0.0000	0.0770	0.0	PASS	PASS	0.0000	0.1155	0.0
30	0.0000	0.0610	0.0	PASS	PASS	0.0000	0.0915	0.0
31	0.0000	0.0720	0.0	PASS	PASS	0.0000	0.1080	0.0
32	0.0001	0.0570	0.2	PASS	PASS	0.0001	0.0855	0.2
33	0.0000	0.0680	0.1	PASS	PASS	0.0001	0.1020	0.1
34	0.0000	0.0540	0.1	PASS	PASS	0.0001	0.0810	0.1
35	0.0000	0.0640	0.0	PASS	PASS	0.0000	0.0960	0.0
36	0.0000	0.0510	0.1	PASS	PASS	0.0001	0.0765	0.1
37	0.0000	0.0600	0.0	PASS	PASS	0.0000	0.0900	0.0
38	0.0000	0.0480	0.1	PASS	PASS	0.0001	0.0720	0.1
39	0.0000	0.0570	0.1	PASS	PASS	0.0001	0.0855	0.1
40	0.0000	0.0460	0.1	PASS	PASS	0.0000	0.0690	0.1

Power Source Verification Data

Harm No.	Harm. Value	Harm. Limit	% Of Limits	% Of Vfund	Result
2	0.032	0.440	7.195	0.014	OK
3	0.073	1.980	3.711	0.034	OK
4	0.017	0.440	3.811	0.008	OK
5	0.071	0.880	8.114	0.033	OK
6	0.030	0.440	6.899	0.014	OK
7	0.037	0.660	5.544	0.017	OK
8	0.045	0.440	10.306	0.021	OK
9	0.026	0.440	5.971	0.012	OK
10	0.031	0.440	7.124	0.014	OK
11	0.021	0.220	9.430	0.009	OK
12	0.015	0.220	6.647	0.007	OK
13	0.014	0.220	6.469	0.006	OK
14	0.032	0.220	14.465	0.015	OK
15	0.013	0.220	5.862	0.006	OK
16	0.017	0.220	7.630	0.008	OK
17	0.018	0.220	8.064	0.008	OK
18	0.014	0.220	6.370	0.006	OK
19	0.015	0.220	6.724	0.007	OK
20	0.019	0.220	8.466	0.008	OK
21	0.017	0.220	7.764	0.008	OK
22	0.024	0.220	11.040	0.011	OK
23	0.018	0.220	8.130	0.008	OK
24	0.017	0.220	7.798	0.008	OK
25	0.015	0.220	6.701	0.007	OK
26	0.016	0.220	7.145	0.007	OK
27	0.015	0.220	6.740	0.007	OK
28	0.016	0.220	7.443	0.007	OK
29	0.014	0.220	6.334	0.006	OK
30	0.014	0.220	6.142	0.006	OK
31	0.014	0.220	6.228	0.006	OK
32	0.014	0.220	6.489	0.007	OK
33	0.016	0.220	7.247	0.007	OK
34	0.014	0.220	6.449	0.006	OK
35	0.015	0.220	6.682	0.007	OK
36	0.017	0.220	7.662	0.008	OK
37	0.018	0.220	8.021	0.008	OK
38	0.020	0.220	8.901	0.009	OK
39	0.014	0.220	6.588	0.007	OK
40	0.017	0.220	7.696	0.008	OK

8. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Measuring Standard

EN 61000-3-3:2013/A2:2021/AC:2022-01

8.3. Measurement 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, d_c , shall not exceed 3.3 %;
- the maximum relative voltage change, d_{max} , shall not exceed 4.0 %;

8.4. 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.

8.5. Test Results

Pass.

Please refer to the following page.

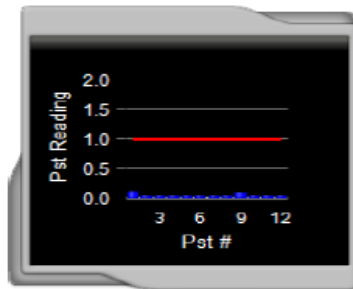
EUT: Soldering Iron 60W (EDL8860)
 Test Standard: Test per IEC 61000-3-3
 Test Class: Flicker Test, All Parameters
 Test Result: **PASS**
 Test Date: 2024/3/1
 Start Time: 17:15:25
 Stop Time: 19:17:32
 Test Duration (min): 120
Source Qualification: Compliance with IEC 61000-3-3
 Temp (°C) : 22.0
 Hum. (% RH) : 31.0
 Customer: Customer
 Test By: Jackson Xue
 Comments: Heating

Last Test Parameters:

Phase A

Vrms (Volts):	219.17	Frequency (Hz):	50.00
I _{rms} (Amps):	0.259	Power (W):	56.86
V-THD (%):	0.048	T-Max (ms):	0 (500)
dmax (%):	-0.945 (4.000)	Hi dmax (%):	-0.945 (4.000)
dc (%):	0.000 (3.300)	Hi dc (%):	0.000 (3.300)
Pst-001 :	0.106 (1.000)	Pst-002 :	0.039 (1.000)
Pst-003 :	0.039 (1.000)	Pst-004 :	0.039 (1.000)
Pst-005 :	0.039 (1.000)	Pst-006 :	0.039 (1.000)
Pst-007 :	0.039 (1.000)	Pst-008 :	0.039 (1.000)
Pst-009 :	0.090 (1.000)	Pst-010 :	0.039 (1.000)
Pst-011 :	0.039 (1.000)	Pst-012 :	0.039 (1.000)
Plt-1 :	0.060 (0.650)		

Pst Spectrum



Plt Spectrum



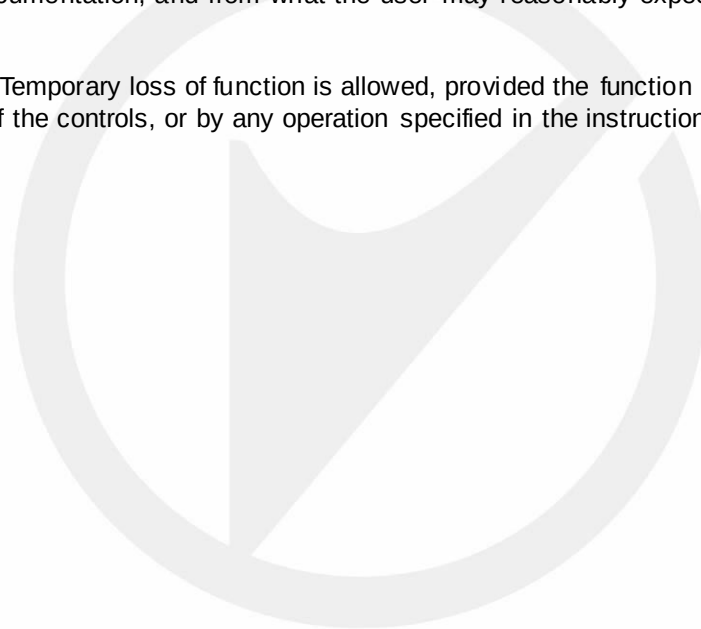
9. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

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

Performance 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.

Performance 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.

Performance 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.

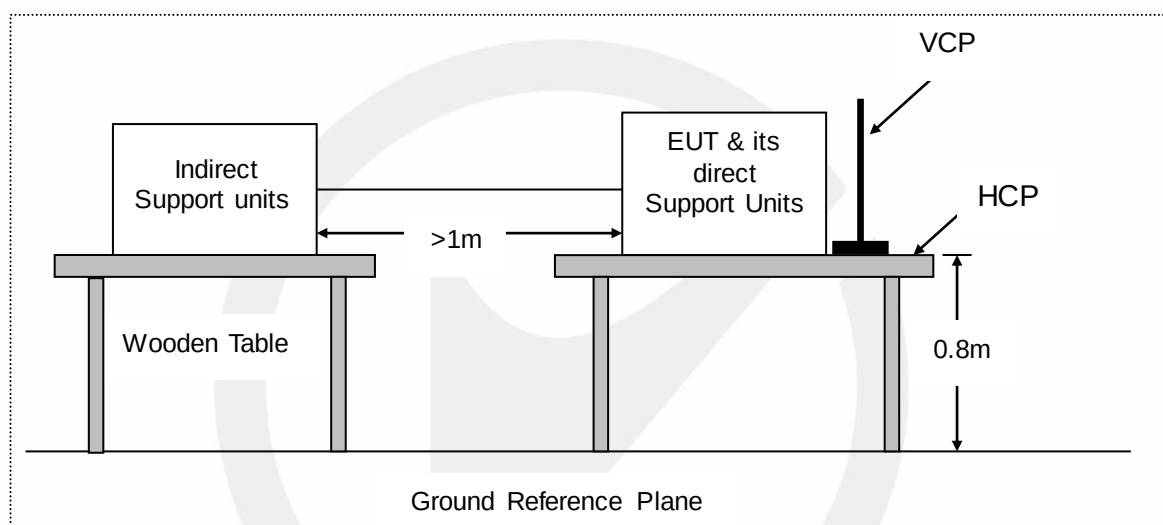


10. ELECTROSTATIC DISCHARGE IMMUNITY TEST

10.1. Test Specification

Test standard : EN IEC 55014-2
 Basic standard : IEC 61000-4-2
 Performance criterion : ☒ B
 ☐ C (Applied to toys not using score or data entered by the user)
 Test level : $\pm 8.0\text{kV}$ (Air discharge)
 $\pm 4.0\text{kV}$ (Contact discharge)

10.2. Block Diagram of Test Setup



10.3. Test Procedure

- a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:
 - ambient temperature: 15°C to 35°C ;
 - relative humidity : 30% to 60%;
 - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar)
- b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
- c. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
- d. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
 - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
 - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
 - The contact discharge test shall not be applied to such surfaces.
- e. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.
- f. The test voltage shall be increased from the minimum to the selected test severity level, in order to

determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.

g. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

h. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

10.4. Test Results

Pass.

Temperature : 23°C
 Humidity : 45%
 Atmospheric Pressure : 101kpa
 Test Engineer : Jackson Xue
 Test Date : 2024-03-01

Air Discharge:

Test Voltage	Location	Actual criterion	Required performance criterion		Result (Pass/Fail)
±2; 4; 8 kV	All slots of the EUT	A	☒ B	☐ C	Pass
±2; 4; 8 kV	Non-Conducted Enclosure	A	☒ B	☐ C	Pass

Contact Discharge

Test Voltage	Location	Actual criterion	Required performance criterion		Result (Pass/Fail)
±2; 4kV	Conducted Enclosure	A	☒ B	☐ C	Pass
±2; 4kV	Screen	A	☒ B	☐ C	Pass

Indirect Discharge

Test Voltage	Location	Actual criterion	Required performance criterion		Result (Pass/Fail)
±2; 4 kV	HCP	A	☒ B	☐ C	Pass
±2; 4kV	VCP	A	☒ B	☐ C	Pass

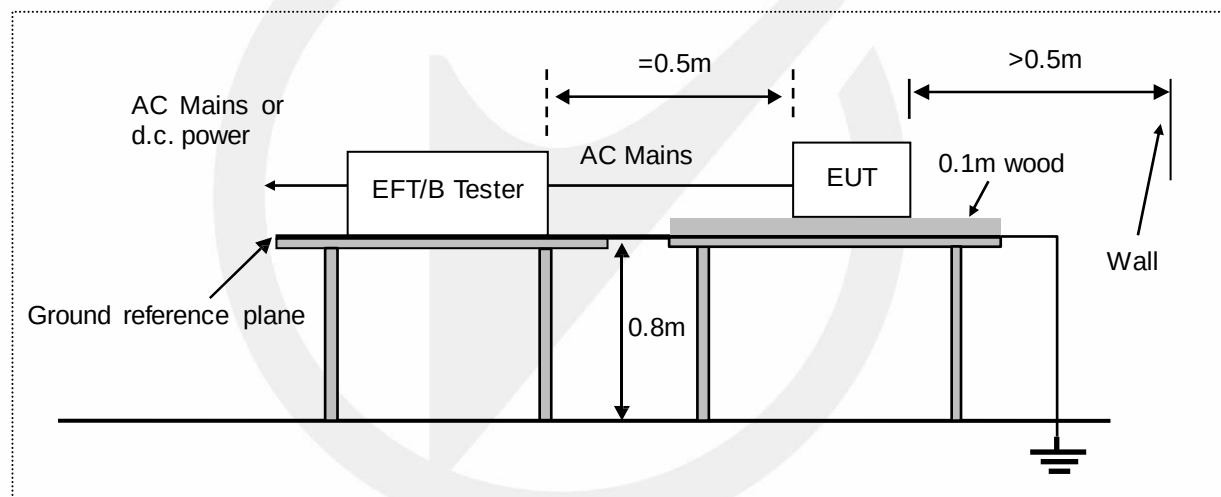
11.ELECTRICAL FAST TRANSIENT S/BURST IMMUNITY TEST

11.1.Test Specification

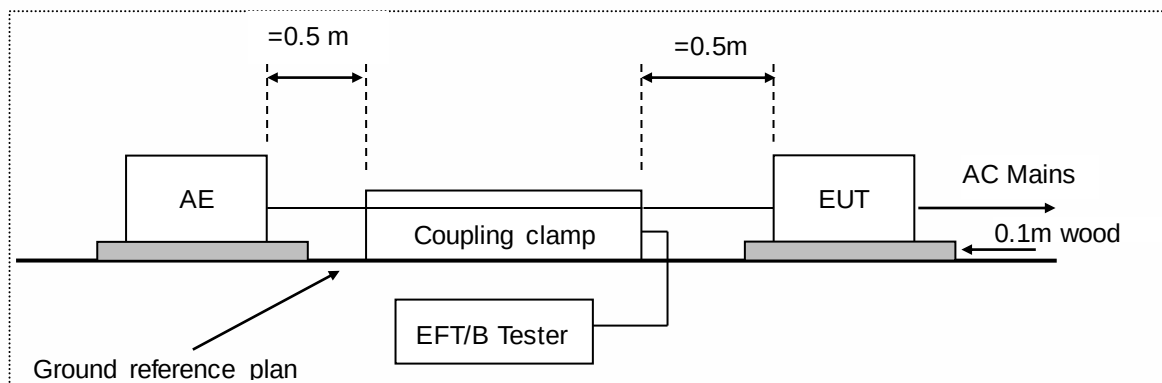
Test standard	: EN IEC 55014-2
Basic standard	: IEC 61000-4-4
Performance criterion	: B
Test level	: ☒ 1kV, Input and output AC power ports ☐ 0.5kV, Signal ports, control ports and wired network ports ☐ 0.5kV, Input and output DC power ports
Repetition frequency	: 5kHz
Tr/Th:	: 5/50ns
Burst period	: 300ms
Test time :	: 120s

11.2.Block Diagram of Test Setup

AC Lines and d.c.power ports:



Signal lines:



11.3. Test Procedure

The EUT is put on the table that is 0.8 meter 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.

11.4. Test Results

Pass.

Temperature : 22°C
 Humidity : 31%
 Atmospheric Pressure : 101kpa
 Test Engineer : Jackson Xue
 Test Date : 2024-03-01

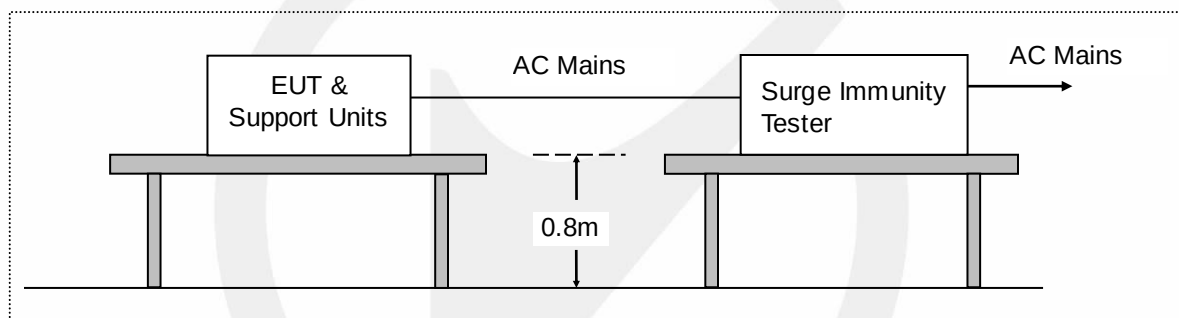
Injection Line	Voltage (kV)	Injected Method	Actual criterion	Required performance criterion	Result (Pass/Fail)
☒ Input and output AC power ports	± 1	☐ CDN ☒ Direct injection ☐ Capacitive coupling clamp	A	B	Pass
☐ Input and output DC power ports	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	B	N/A
☐ Signal ports, control ports and wired network ports	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	B	N/A

12.SURGE IMMUNITY TEST

12.1.Test Specification

Test standard	: EN IEC 55014-2
Basic standard	: IEC 61000-4-5
Performance criterion	: B
Test level	: ☒ 1kV, Line to Line, Input AC power ports, Criterion B ☐ 2kV, Line to Earth, Input AC power ports, Criterion B ☐ 1kV, Line to Earth (Unshielded), Wired network ports, Criterion B ☐ 0.5kV, Shield to Earth (Shielded), Wired network ports, Criterion B
Number of surges	: 5 (for each combination of parameters)
Repetition rate	: 1 minute / time
Polarity:	: Positive / Negative
Phase angle:	: 90°, 270°

12.2.Block Diagram of Test Setup



12.3.Test Procedure

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common mode (Line to Ground) and differential mode (Line to Line). Each device was tested in a total of two surge configurations: Line to Ground (L-G): Combination Wave, Line to Protective Earth with 9uF and 10ohm and Neutral to Protective Earth with 9uF and 10ohm, common mode, generator earthed.

Line to Line (L-L): Combination Wave,

Line to Neutral with 18uF, differential mode, generator floated.

2 ohm : the source impedance of the low-voltage power supply network.

12 ohm : the source impedance of the low-voltage power supply network and ground.

The positive pulses are applied 90° relative to the phase angle of the a.c. line voltage to the equipment under test, and the negative pulses are applied 270° relative to the phase angle of the a.c. line voltage to the equipment under test. Tests with other (lower) voltages than those given in Table 12 are not required.

- If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).
- The surges have to be applied line to line and line to earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
- The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan. All lower levels including the selected test level shall be satisfied.
- For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.
- Testing shall be performed according to a Test Plan, which shall be included in the test report.

f. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied.

12.4. Test results

Pass.

Temperature : 22°C
Humidity : 31%
Atmospheric Pressure : 101kpa
Test Engineer : Jackson Xue
Test Date : 2024-03-01

☒ Input AC power ports:

Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☒ Line to line	1	1.2/50 (8/20)	Pos./ Neg.	A	B	Pass
☐ Line to earth	2	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A

☐ Wired network ports:

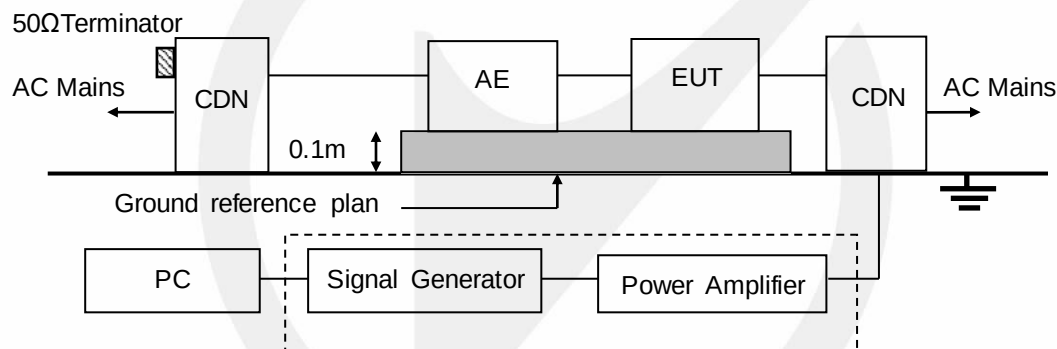
Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ Line to earth	1	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A
☐ Shield to Earth	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A

13. INJECTED CURRENTS SUSCEPTIBILITY IMMUNITY TEST

13.1. Test Specification

Test standard	: EN IEC 55014-2
Basic standard	: IEC 61000-4-6
Performance criterion	: A
Test level	: ☒ Input and output a.c. power ports, 0.15 MHz to 230 MHz, 3V ☐ Signal ports, control ports and wired network ports, 0.15 MHz to 230 MHz, 1V ☐ Input and output d.c. power ports, 0.15 MHz to 230 MHz, 1V ☐ Input and output a.c. power ports, 0.15 MHz to 80 MHz, 3V ☐ Signal ports, control ports and wired network ports, 0.15 MHz to 80 MHz, 1V ☐ Input and output d.c. power ports, 0.15 MHz to 80 MHz, 1V
Modulation	: AM 80%, 1kHz sine-wave
Frequency Step	: 1% of fundamental

13.2. Block Diagram of Test Setup



13.3. Test Procedure

- The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
- The EUT is placed on a 0.1m high test table, and a well grounded cable is connected to metallic plane above the test table.
- All cables/wires must be laid out on test plate (3cm in thickness), and the EUT is set up on test plate (10 cm in thickness) as shown in test setup photo, and the cables/wires must not be in mid-air, they should be touching the surface of test plate. Ensure that the EUT is properly connected to the accessory equipment.
- The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
- The frequency range is swept from 150 kHz to 230 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
- The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
- Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise

modes selected for susceptibility

h. Testing shall be performed according to a Test Plan, which shall be included in the test report.

13.4. Test results

Pass.

Temperature : 22°C

Humidity : 31%

Atmospheric Pressure : 101kpa

Test Engineer : Jackson Xue

Test Date : 2024-03-01

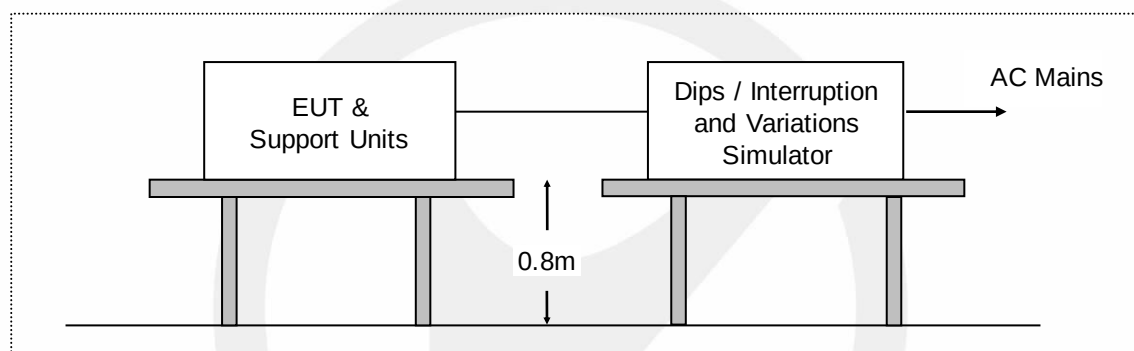
Range (MHz)	Levers (V)	Injection port	Coupling type	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ 0.15-80 ☒ 0.15-230	3	☒ Input and output AC power	☒ CDN ☐ EM Clamp ☐ Current Clamp ☐ Direct injection	A	A	Pass
☐ 0.15-80 ☐ 0.15-230	1	☐ Signal ports, control ports and wired network ports	☐ CDN ☐ EM Clamp ☐ Current Clamp ☐ Direct injection	N/A	A	N/A
☐ 0.15-80 ☐ 0.15-230	1	☐ Input and output DC power	☐ CDN ☐ EM Clamp ☐ Current Clamp ☐ Direct injection	N/A	A	N/A

14. VOLTAGE DIPS IMMUNITY TEST

14.1. Test Specification

Test standard	: EN IEC 55014-2
Basic standard	: IEC 61000-4-11
Test level	: ☒ 0%, 0.5 periods, Criterion C
	☒ 40%, 10 periods for 50Hz, Criterion C
	☐ 40%, 12 periods for 60Hz, Criterion C
	☒ 70%, 25 periods for 50Hz, Criterion C
	☐ 70%, 30 periods for 60Hz, Criterion C

14.2. Block Diagram of Test Setup



14.3. Test Procedure

- a. Where the equipment has a rated voltage the following shall apply - If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for test level specification.
 - In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.
- b. Test Conditions
 - Select operated voltage and frequency of EUT - Test of interval : 10 sec.
 - Level and duration : Sequence of 3 dips/interrupts.
 - Voltage rise (and fall) time : 1.5 μ s.

14.4. Test results

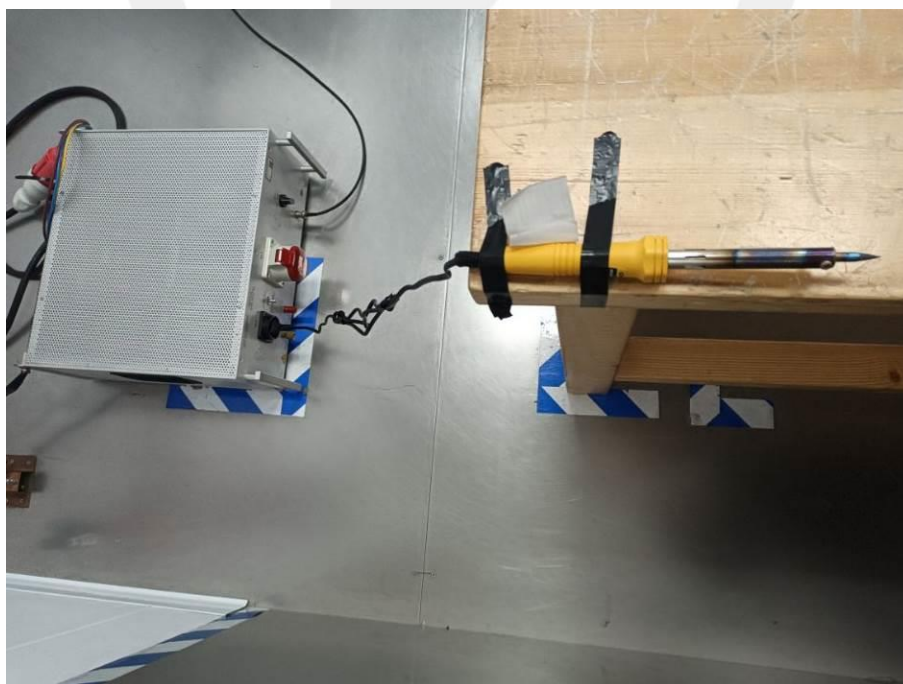
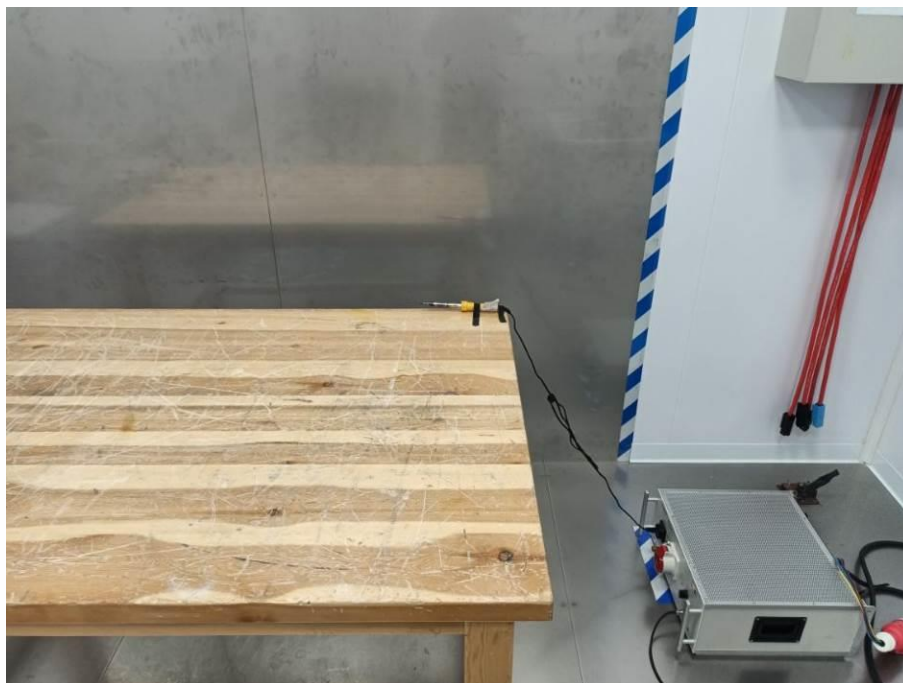
Pass.

Temperature : 22°C
Humidity : 31%
Atmospheric Pressure : 101kpa
Test Engineer : Jackson Xue
Test Date : 2024-03-01

Item	Test Level (% UT)	Phase angle (°)	Input Voltage (V)	Freq (Hz)	Duration (periods)	Actual criterion	Required performance criterion	Result (Pass /Fail)
☒ Voltage dips	0%	0°, 180°	AC 220V	50	0.5	A	C	Pass
☐ Voltage dips	0%	0°, 180°	AC 220V	60	0.5	N/A	C	N/A
☒ Voltage dips	40%	0°, 180°	AC 220V	50	10	A	C	Pass
☐ Voltage dips	40%	0°, 180°	AC 220V	60	12	N/A	C	N/A
☒ Voltage dips	70%	0°, 180°	AC 220V	50	25	A	C	Pass
☐ Voltage dips	70%	0°, 180°	AC 220V	60	30	N/A	C	N/A

15. PHOTOGRAPH OF TEST

15.1. Photo of Conducted Emission at Mains Measurement



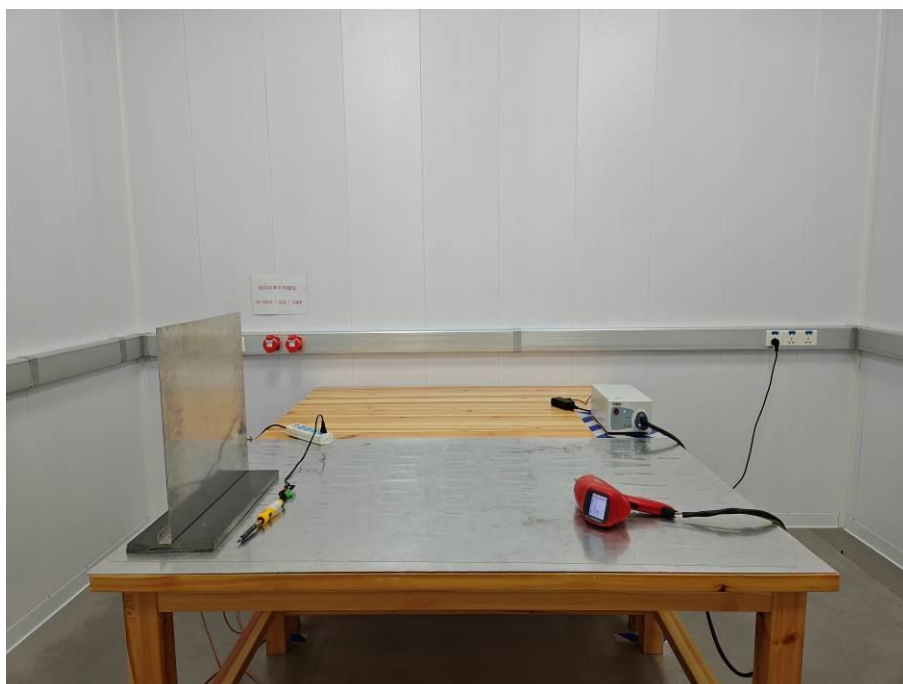
15.2.Photo of Disturbance Power Measurement



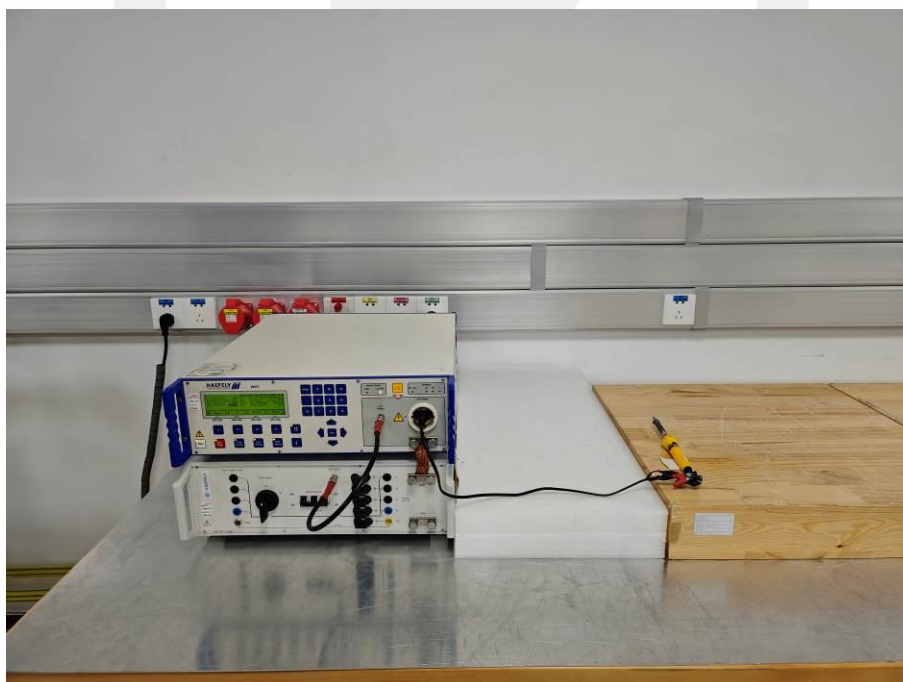
15.3.Photo of Harmonic Current Emission / Voltage Fluctuation And Flicker Measurement



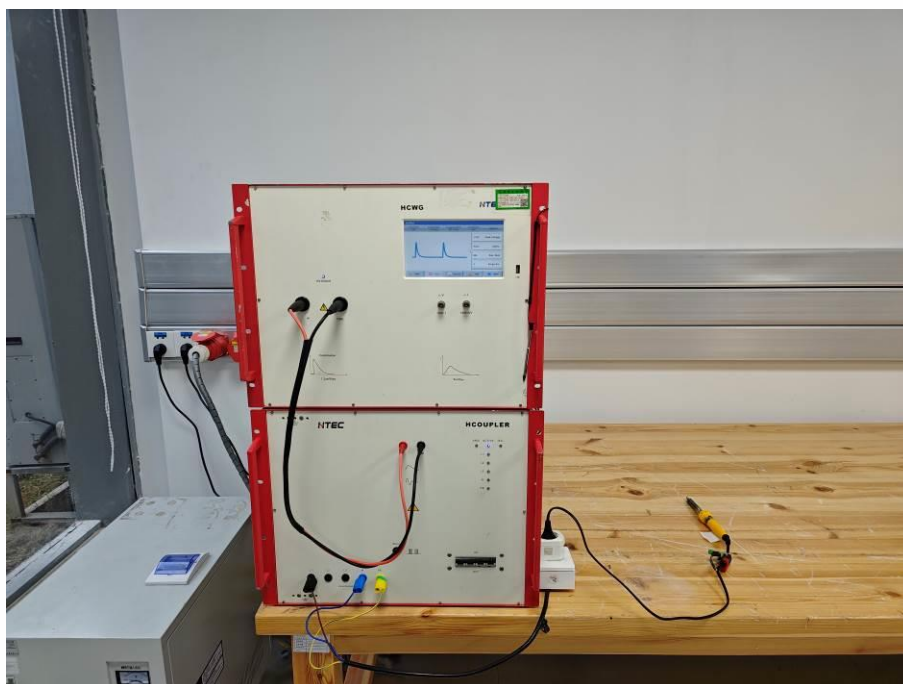
15.4.Photo of Electrostatic Discharge Immunity Test



15.5.Photo of Electrical Fast Transient / Burst Immunity Test



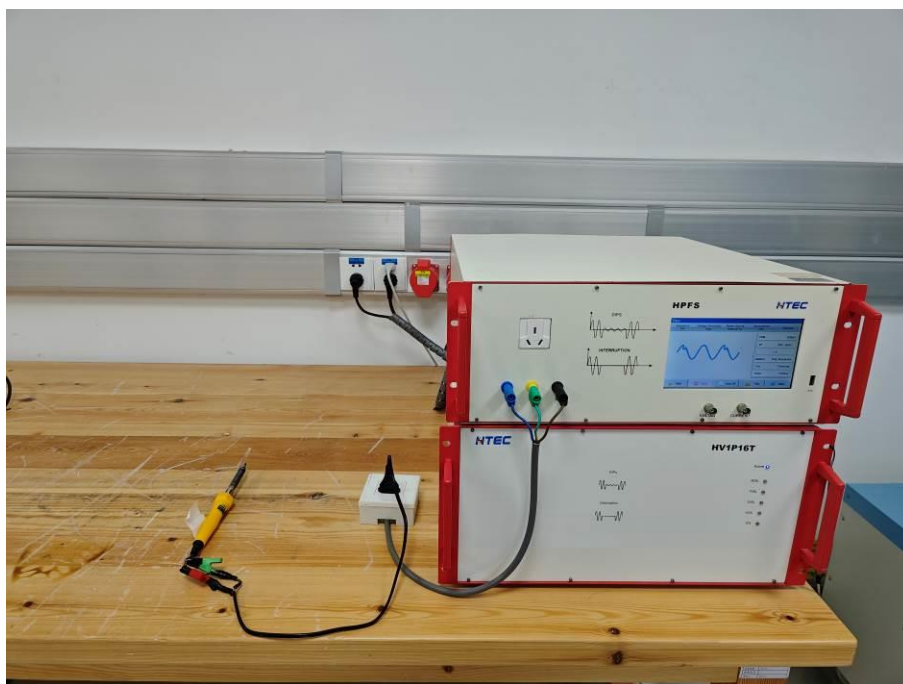
15.6.Photo of Surge Immunity Test



15.7.Photo of Injected Currents Susceptibility Immunity Test



15.8.Photo of Voltage Dips Immunity Test

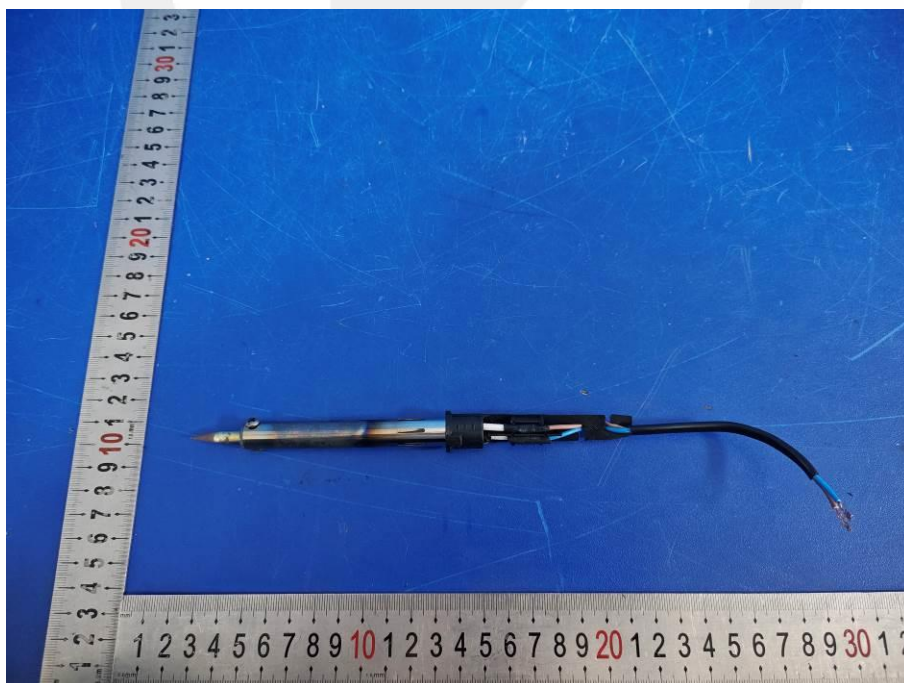


APPENDIX I (Photos of EUT)









*** End of Report ***

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