



EUROFINS ELECTRICAL TESTING SERVICE (SHENZHEN) CO., LTD.

EMC TEST- REPORT

TEST REPORT NUMBER: EFGX24010384-IE-02-E01



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park,
No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

Phone : +86-755-82911867
Fax : +86-755-82910749
Page 1 of 34

TABLE OF CONTENTS

1	General Information	3
1.1	Notes	3
1.2	Testing laboratory	4
1.3	Details of approval holder	4
1.4	Application details	4
1.5	EUT information	4
1.6	Test standards	4
2	Technical test	5
2.1	Summary of test results	5
2.2	Test environment	5
2.3	Test mode	5
2.4	Test equipment utilized	6
2.5	System Measurement Uncertainty	6
2.6	Test results	7
3	Emission Test	8
3.1	Radiated disturbance	8
3.2	Conducted Emission	11
3.3	Disturbance power	13
3.4	Harmonic current emission	15
3.5	Voltage Changes, Voltage Fluctuations and Flicker	17
4	Immunity Test	18
4.1	Performance Criteria Description in Clause 6 of EN IEC 55014-2	18
4.2	Classification of apparatus	18
4.3	Electrostatic Discharge	19
4.4	Radio frequency electromagnetic fields	21
4.5	Electrical Fast Transients	22
4.6	Surge Immunity	23
4.7	Injected currents(RF continues conducted)	24
4.8	Voltage dips and Interruption	25
5	Test setup Photos	26
6	EUT Photos	28

1 General Information

1.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter “Description of test item” and are not transferable to any other test items.

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd. is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

The test report may only be reproduced or published in full. Reproducing or publishing extracts of the report requires the prior written approval of the Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.

This document is subject to the General Terms and Conditions and the Testing and Certification System of Eurofins Electrical Testing Service (Shenzhen) Co., Ltd. available on request or accessible at www.eurofins.com.

Operator:

2024-02-28

Aemon Huang / Project Engineer



Date

Eurofins-Lab.

Name / Title

Signature

Technical responsibility for area of testing:

2024-02-28

Tom Tian / EMC Supervisor

Date

Eurofins

Name / Title

Signature

Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
 Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

1.2 Testing laboratory

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.

Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

Telephone : +86-755-82911867

Fax : +86-755-82910749

1.3 Details of approval holder

Name : Nemo Power Tools Limited
Address : 21st Floor, CMA Building 64 Connaught Road Central Hong Kong
Telephone : ./.
Fax : ./.

1.4 Application details

Date of receipt of test item : 2024-01-26
Date of receipt of test sample : 2024-01-26
Date of test : 2024-01-26 to 2024-02-20
Date of issue : 2024-02-28

1.5 EUT information

Product name : Vacuum Lifter
Model name : VLP 18
Brand name : FLEX
Sample ID : 240126-06-001
Ratings : DC 18V
Test voltage : DC 18V
Additional information : ./.

(General disclaimer:

The above sample(s) and sample information was/were submitted and identified on behalf of the applicant. Eurofins assures objectivity and impartiality of the test, and fulfills the obligation of confidentiality for applicant's commercial information and technical documents.)

1.6 Test standards

Technical standard :

EN IEC 55014-1:2021

EN IEC 55014-2:2021

Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



or

The deviations as specified were ascertained in the course of the tests performed.



2.2 Test environment

Temperature	:	15	...	35°C
Relative humidity content	:	30	...	60%
Air pressure	:	86	...	106kPa

2.3 Test mode

TM1: Operating

2.4 Test equipment utilized

EQUIPMENT ID	EQUIPMENT NAME	MODEL NO.	CAL. DUE DATE
23-2-13-01	EMI Test Receiver	ESR7	2024-03-22
23-2-13-02	Signal Analyzer	N9020B-544	2024-03-22
23-2-12-02	TRILOG Broadband Antenna	VULB9168	2024-05-29
23-2-10-01	Preamplifier	BBV9745	2024-03-22
23-2-13-10	ESD Generator	NSG437	2024-03-22
23-2-13-07	Signal Generator	N5171B-506	2024-03-22
23-2-13-08	Power meter	N1914A	2024-03-22
23-2-10-26	Average power sensor	E9301A	2024-03-22
23-2-10-75	Average power sensor	E9301A	2024-03-22
23-2-10-27	Broadband Amplifier	CBA1G-150D	2024-03-22
23-2-12-11	Antenna	STLP9129	2024-05-29
23-2-10-71	PC	M4000E-16	N/A
23-2-10-72	LED Monitor	V193HQV	N/A
23-2-18-006	Test software	TS+VER2.1-JS35-RS	N/A
23-2-18-007	Test software	TS+VER2.1-JS32-RE	N/A

2.5 System Measurement Uncertainty

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.56dB; Vertical: 4.55dB;
Uncertainty for RS test	25%, K=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

2.6 Test results

 1st test

 test after modification

 production test

Test item	Sub clause	Required	Test passed	Test failed
Conducted Emission	Clause 4.3.2 & 4.3.3 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance power	Clause 4.3.4.4 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated disturbance (30MHz to 1000MHz)	Clause 4.3.4 of EN IEC 55014-1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated disturbance (1000MHz to 6000MHz)	Clause 4.3.5 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnetic field (equipment using IPT)	Clause 4.3.2 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discontinuous disturbance	Clause 4.4.2 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmonic Current Emissions	EN IEC 61000-3-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage Changes, Voltage Fluctuations and Flicker	EN 61000-3-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrostatic Discharge	Clause 5.1 of EN IEC 55014-2 & IEC 61000-4-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electrical Fast Transients	Clause 5.2 of EN IEC 55014-2 & IEC 61000-4-4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Injected currents (RF continues conducted)	Clause 5.3 & 5.4 of EN IEC 55014-2 & IEC 61000-4-6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio frequency electromagnetic fields	Clause 5.5 of EN IEC 55014-2 & IEC 61000-4-3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Surge immunity	Clause 5.6 of EN IEC 55014-2 & IEC 61000-4-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage dips and Interruption	Clause 5.7 of EN IEC 55014-2 & IEC 61000-4-11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note:

1. The EUT belongs to Category III.

Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
 Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

3 Emission Test

3.1 Radiated disturbance

This clause lays down the general requirements for the measurement of Radiated disturbance produced at the space of apparatus.

3.1.1 Limits

Frequency range	Peak limits at 3m	Quasi-peak limits at 3m	Average limits at 3m
MHz	dB ($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 to 230	/	40	/
230 to 1000	/	47	/
1000 to 3000	70	/	50
3000 to 6000	74	/	54

At transitional frequencies the lower limit applies.

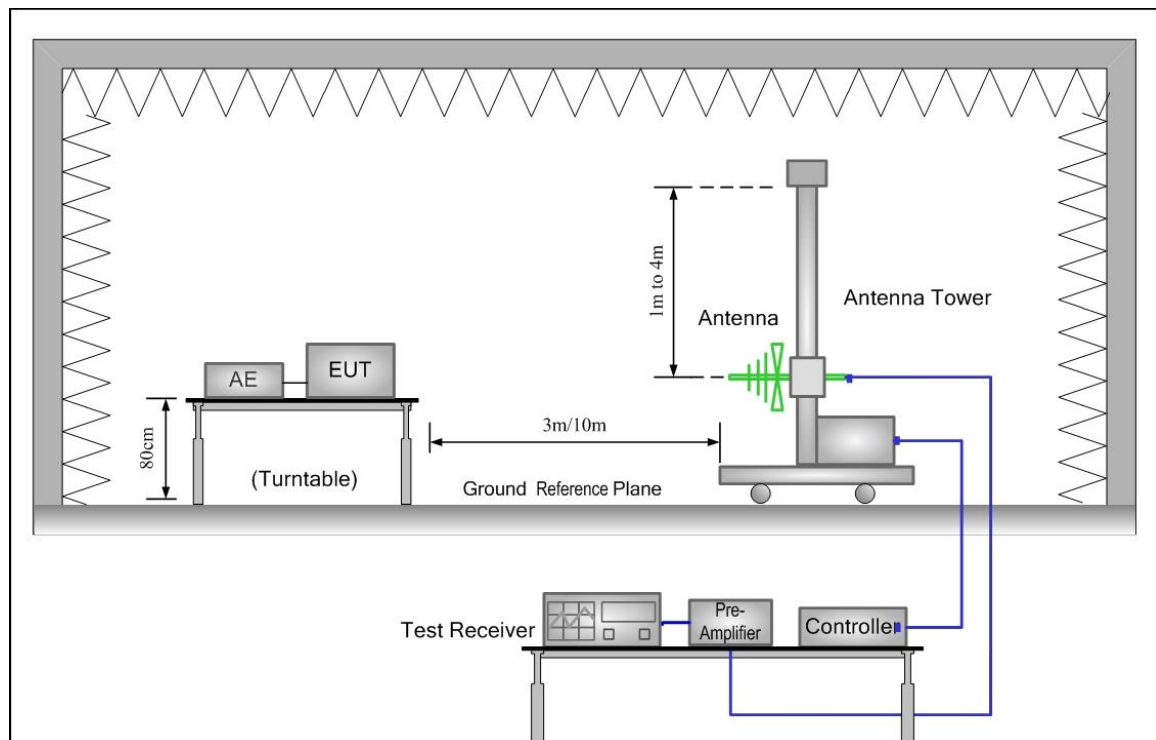
Note 1: Radiated disturbance test in the frequency range from 1 GHz to 6 GHz is not required as the highest clock frequency (F_x) of EUT is less than 108MHz

Note 2: Result Level= Read Level + Corrector Factor

Note 3: Below 1GHz: Corrector factor = Antenna Factor + Cable Loss - Amplifier Gain.

Note 4: Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

3.1.2 Measurement procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was

placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

2. Before get the final emission results with quasi-peak(QP) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT.

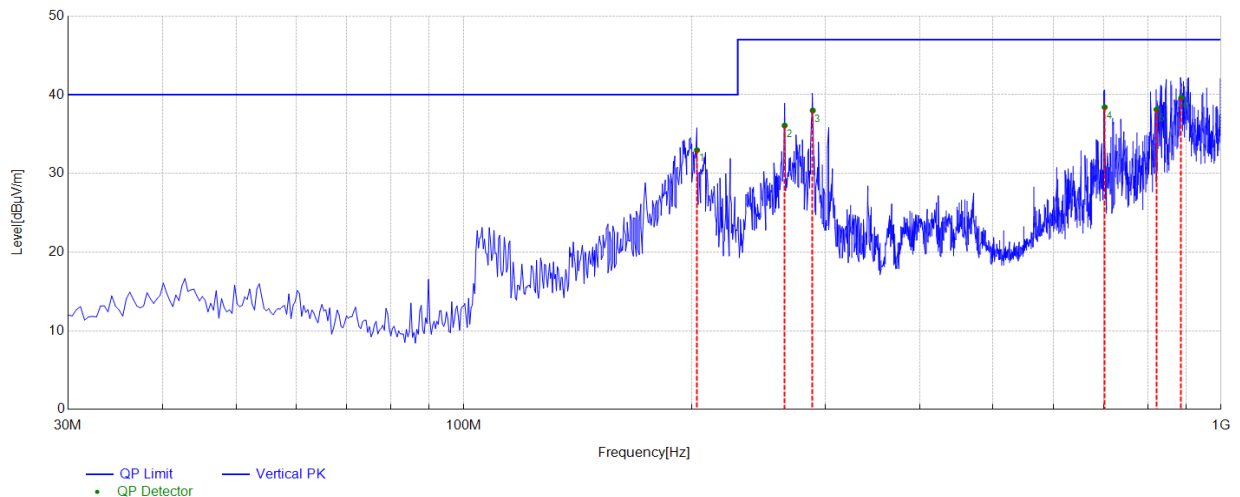
3. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Test was performed at 3 m distance.

3.1.3 Test environment

Temperature : 27.8 °C
 Relative humidity content : 56.7 %
 Air pressure : 101.5 kPa

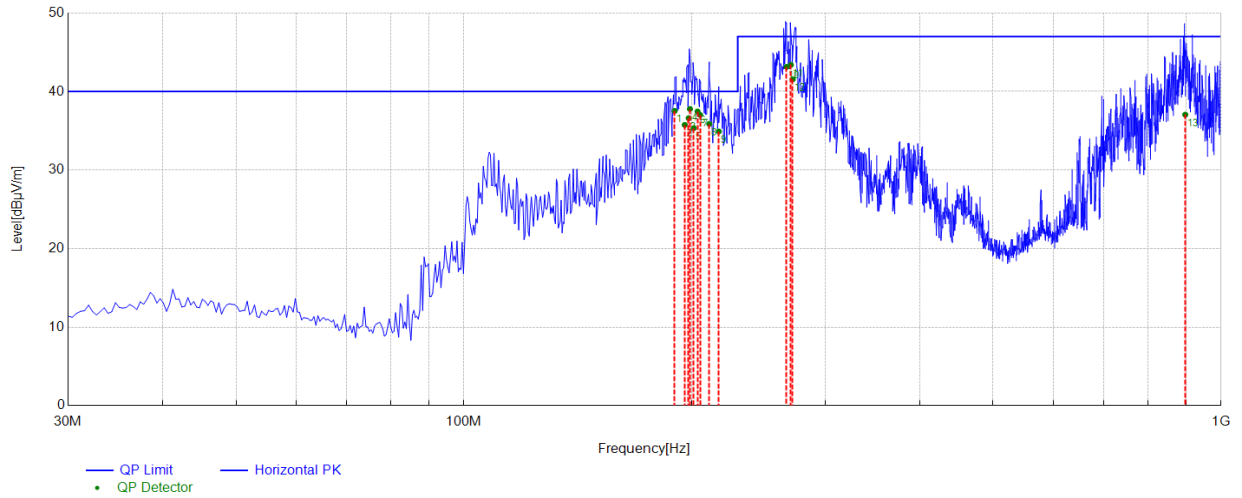
3.1.4 Results

Vertical Polarity Test Data



QP Final Data List									
NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	203.1172	-18.92	32.96	40.00	7.04	100	12	Vertical	PASS
2	265.2221	-17.12	36.09	47.00	10.91	100	215	Vertical	PASS
3	288.8996	-16.59	38.00	47.00	9.00	100	12	Vertical	PASS
4	701.8968	-6.60	38.41	47.00	8.59	100	290	Vertical	PASS
5	821.8367	-5.35	38.12	47.00	8.88	200	116	Vertical	PASS
6	886.2705	-4.01	39.63	47.00	7.37	100	155	Vertical	PASS

Horizontal Polarity Test Data



QP Final Data List									
NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	189.7977	-18.60	37.54	40.00	2.46	200	183	Horizontal	PASS
2	195.7423	-18.80	35.75	40.00	4.25	200	12	Horizontal	PASS
3	198.0939	-18.92	36.61	40.00	3.39	200	12	Horizontal	PASS
4	198.8475	-18.92	37.78	40.00	2.22	200	12	Horizontal	PASS
5	201.1765	-18.95	35.34	40.00	4.66	200	12	Horizontal	PASS
6	203.5054	-18.91	37.46	40.00	2.54	100	342	Horizontal	PASS
7	205.0580	-18.89	37.03	40.00	2.97	200	12	Horizontal	PASS
8	210.8804	-18.83	35.88	40.00	4.12	200	360	Horizontal	PASS
9	217.0908	-18.93	34.92	40.00	5.08	100	46	Horizontal	PASS
10	266.7634	-17.00	43.14	47.00	3.86	100	146	Horizontal	PASS
11	270.2681	-16.68	43.39	47.00	3.61	100	6	Horizontal	PASS
12	271.8122	-17.00	41.56	47.00	5.44	100	311	Horizontal	PASS
13	896.8358	-3.71	37.06	47.00	9.94	100	288	Horizontal	PASS

Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
 Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

3.2 Conducted Emission

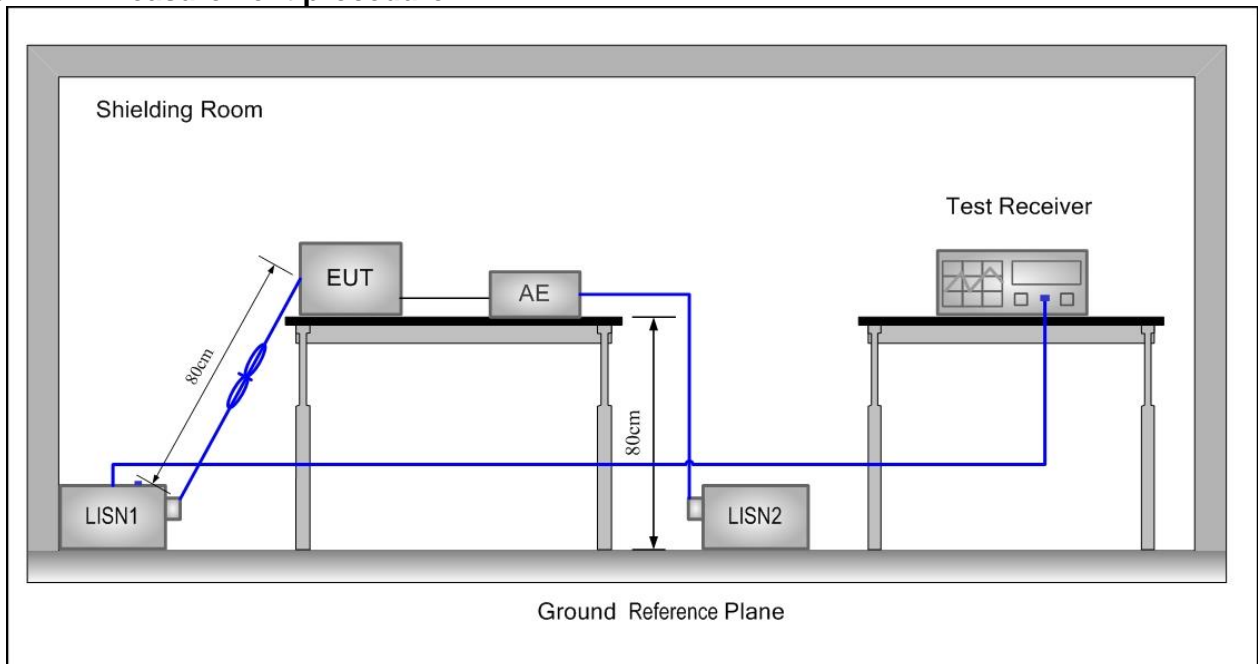
This clause lays down the general requirements for the measurement of disturbance voltage produced at the terminals of apparatus.

3.2.1 Limits

Frequency range MHz	At mains terminals dB (μ V)	
	Quasi-peak Limit	Average Limit
0.15 to 0.50	66 to 56	59 to 46
0.50 to 5	56	46
5 to 30	60	50

Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 30 MHz.
 Note2: The lower limit is applicable at the transition frequency.

3.2.2 Measurement procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN (Line Impedance Stabilization Network) which provides a $(50 \mu\text{H} + 5 \Omega) \parallel 50 \Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before get the final emission results with quasi-peak(QP) detector and average(AV) detector, a pre-scan was performed with the peak(PK) and average(AV) detector to find out the maximum emission data plots of the EUT.

Test Report No.: EFGX24010384-IE-02-E01

3.2.3 Test environment

Temperature : °C
Relative humidity content : %
Air pressure : kPa

3.2.4 Results -Measurement Data

N/A

3.3 Disturbance power

This clause lays down the general requirements for the measurement of disturbance power produced at the terminals of apparatus.

3.3.1 Limits

Table 2a-Disturbance power limits for the frequency range 30 MHz to 300 MHz

Frequency range MHz	Limit dB (pW)	
	Quasi-peak	Average
30 to 300	45 to 55	35 to 45

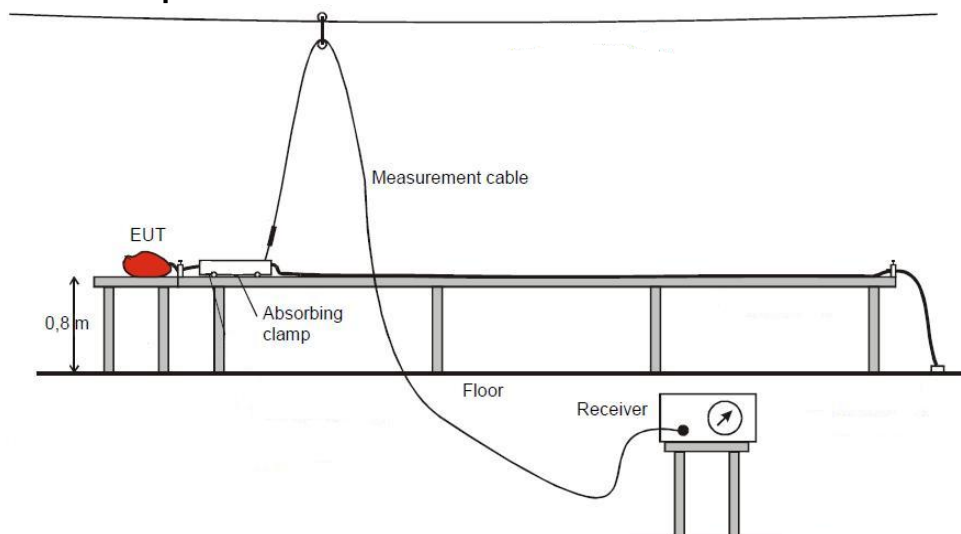
Note: Increasing linearly with the frequency from.

If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

Table 2b-Margin when performing disturbance power measurement in the frequency range 30 MHz to 300 MHz

1	Household and similar appliances		Tools					
	2	3	4	5	6	7	8	9
Frequency range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average
	Increasing linearly with the frequency from:							
200 to 300	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	-

3.3.2 Measurement procedure



Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen, Guangdong, China

The test configuration corresponds to the standard EN IEC 55014-1. The equipment under test is placed on a non metallic table with 0,8 m high. The lead to be measured is stretched horizontally in a straight line, to permit variation in position of the absorbing clamp along the lead to find the maximum indication. The lead shall be at least length of 6 meter. Before get the final emission results with quasi-peak(QP) detector and average(AV) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT. The absorbing clamp is placed around the lead.

3.3.3 Test environment

Temperature	:	°C
Relative humidity content	:	%
Air pressure	:	kPa

3.3.4 Results

N/A

3.4 Harmonic current emission

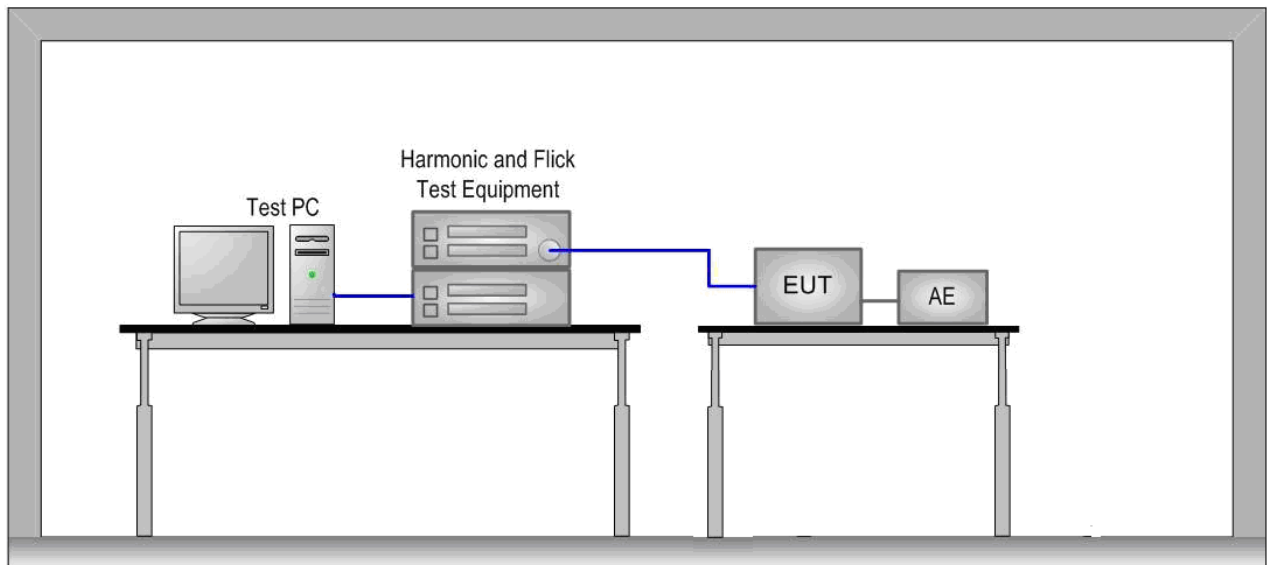
This part deals with the limitation of harmonic currents injected into the public supply system.

3.4.1 Limits

Limit 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
$15 \leq n \leq 39$	$0,15 \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \leq n \leq 40$	$0,23 \frac{8}{n}$

3.4.2 Measurement procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab. For each harmonic order, measure the 1,5 s smoothed r.m.s. harmonic current in each DFT time window and calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period. Each harmonic order, all 1.5 s smoothed r.m.s. harmonic current values and the average values for the individual harmonic currents, taken over the entire test observation period shall be less than or equal to the applicable limits.

3.4.3 Test environment

Temperature : °C
Relative humidity content : %
Air pressure : kPa

3.4.4 Results

N/A

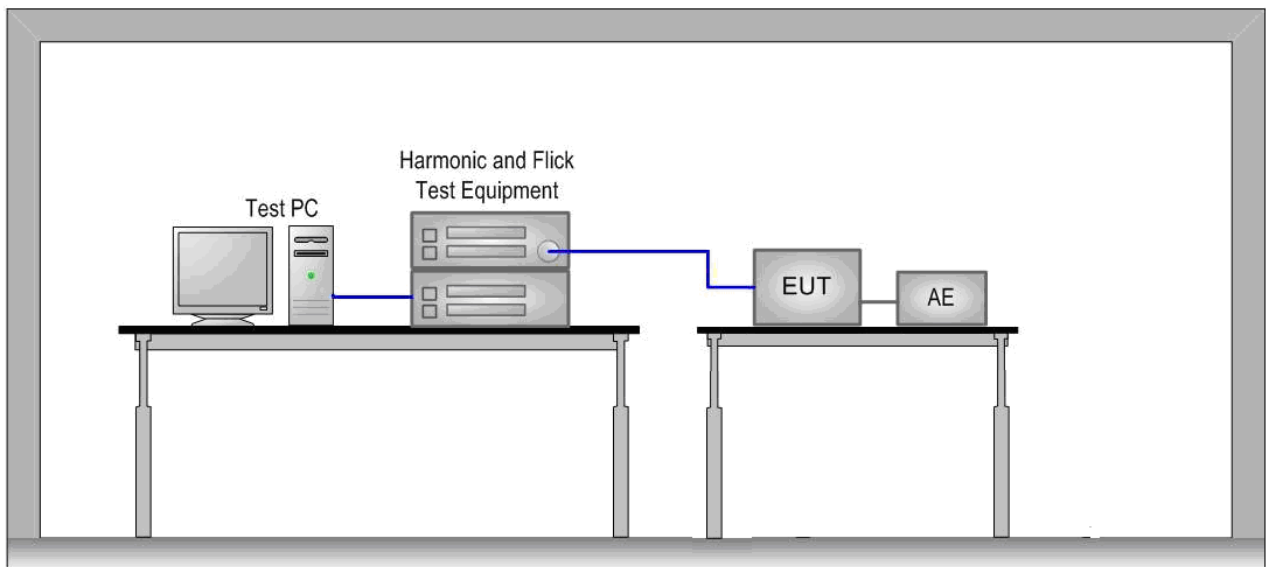
3.5 Voltage Changes, Voltage Fluctuations and Flicker

This part is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

3.5.1 Limits

Value	Limit
Pst	1,0
Plt	0,65
dt	3,3%
dc	3,3%
dmax	4,0%

3.5.2 Measurement test procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.

3.5.3 Test environment

Temperature : °C
 Relative humidity content : %
 Air pressure : kPa

3.5.4 Results

N/A

4 Immunity Test

4.1 Performance Criteria Description in Clause 6 of EN IEC 55014-2

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.

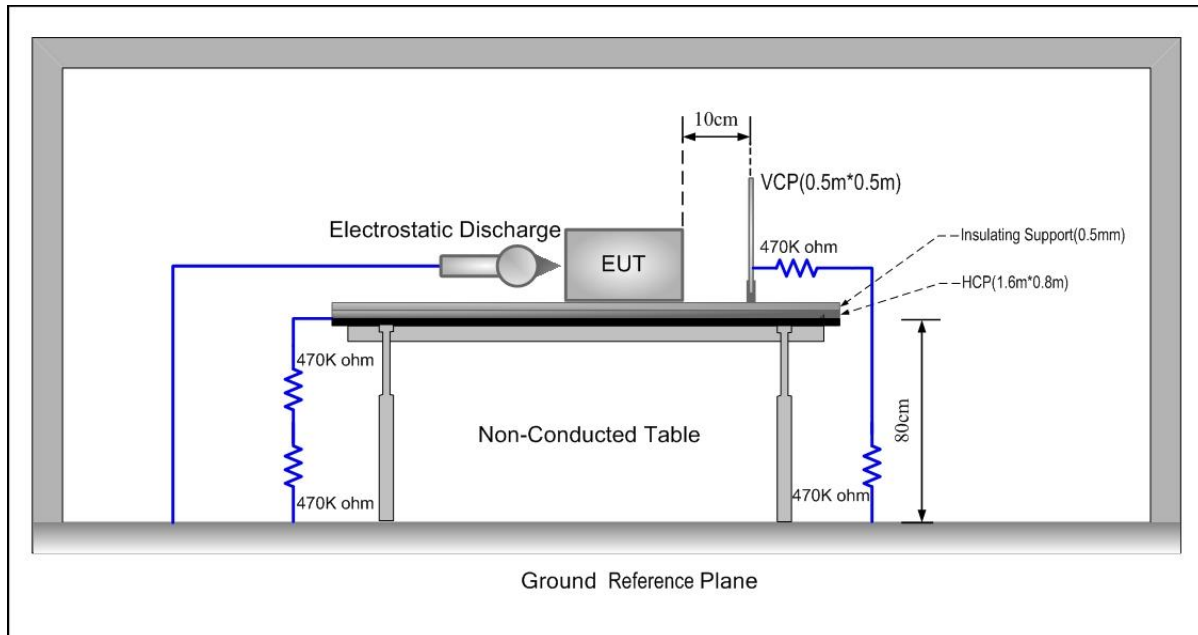
4.2 Classification of apparatus

Category I:	Apparatus containing no electronic control circuitry.
Category II:	Mains operated equipment containing electronic control circuitry with no clock frequency higher than 15 MHz.
Category III:	Battery operated equipment not included in Category I. This category also includes equipment provided with rechargeable batteries, which can be charged, directly or indirectly, from the mains. Accordingly, this equipment shall also be subjected to the test requirements for mains operated equipment but only when testing the charging function If the equipment can operate its intended functions when connected, directly or indirectly to the mains, then it is not battery operated. Accordingly, it shall be classified as Category II, Category IV or Category V, as applicable, and subjected to the corresponding test requirements when in mains operation.
Category IV:	Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 15 MHz but lower than or equal to 200 MHz.
Category V:	Mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 200 MHz.

The EUT belongs to Category III.

4.3 Electrostatic Discharge

4.3.1 Test Procedures



1. Contact discharge was applied only to conductive surfaces of the EUT. Air discharge was applied only to non-conducted surfaces of the EUT.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surfaces excepted the GRP, HCP and VCP was greater than 1m.
4. During the contact discharges, the tip of the discharge electrode was touching the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

4.3.2 Test environment

Temperature : 26.3 °C
 Relative humidity content : 57.5 %
 Air pressure : 101.5 kPa

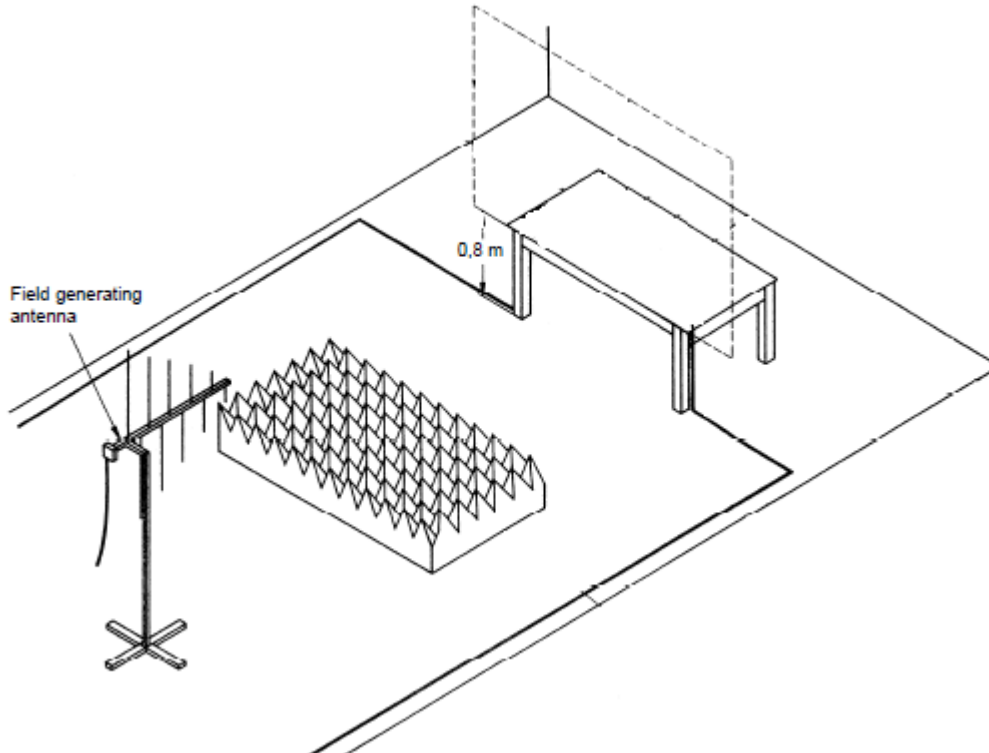
4.3.3 Results

Test point	Table (T) Floor (F)	Contact (C) Air (A)	Voltage (kV)	Number of discharge	Polarity (+ / -)	Opinion
Air discharge	T	A	±2, ±4, ±8	Mini 20/point	+ / -	A
Direct discharge	T	C	±2, ±4	Mini 20/point	+ / -	A
HCP	T	C	±2, ±4	Mini 20/point	+ / -	A
VCP	T	C	±2, ±4	Mini 20/point	+ / -	A

A: no loss of function.
 N/A: Not Applicable.

4.4 Radio frequency electromagnetic fields

4.4.1 Measurement procedure



1. The EUT was placed on 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. The tests normally shall be performed with the generating antenna facing each of four sides of the EUT. When equipment can be used in different orientations (e.g. vertical or horizontal) the test shall be performed on all possible sides of the EUT.
2. The tests are carried out with a field strength by 3 V/m (measured in the unmodulated field) with amplitude modulated signal by a depth of 80 % by a sinusoidal audio signal of 1 kHz. The logarithmic step was 1% and the dwell time was 3s dependent of the EUT cycle time.

4.4.2 Test environment

Temperature : 27.1 °C
 Relative humidity content : 54.5 %
 Air pressure : 101.5 kPa

4.4.3 Results

Frequency Range	Field Strength	Modulation	Antenna Polarity	Opinion
80MHz-1GHz	3V/m	80% AM 1kHz	Horizontal	A
80MHz-1GHz	3V/m	80% AM 1kHz	Vertical	A

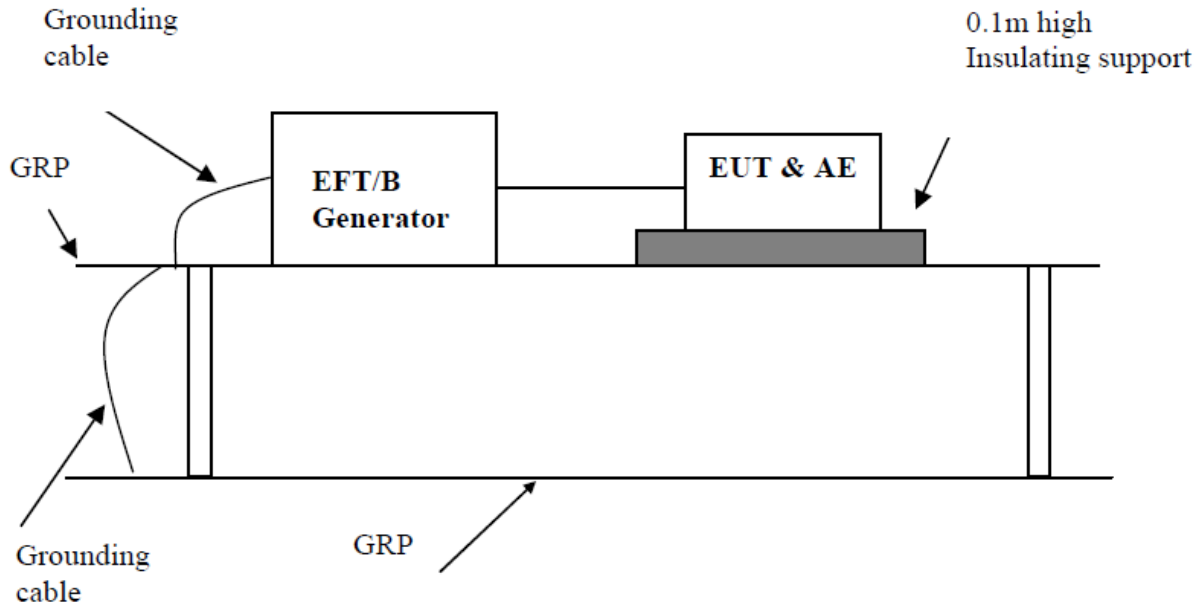
A: no loss of function

Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
 Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen,
 Guangdong, China

4.5 Electrical Fast Transients

4.5.1 Measurement procedure



1. The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The GRP shall project beyond the EUT and the clamp by at least 0.1m on all sides. The distance between the EUT and any other of the metallic surface except the GRP was greater than 0.5m. All cables to the EUT was placed on the insulation support 0.1m above GRP. Cables not subject to EUT was routed as far as possible from cable under test to minimize the coupling between the cables.
3. The length of signal and power cable between the EUT and EFT generator was 0.5m. If the cable is a non-detachable supply cable more than 0.5m, the excess length of this cable shall be folded to avoid a flat coil and situated at a distance of 0.1m above the GRP.

4.5.2 Test environment

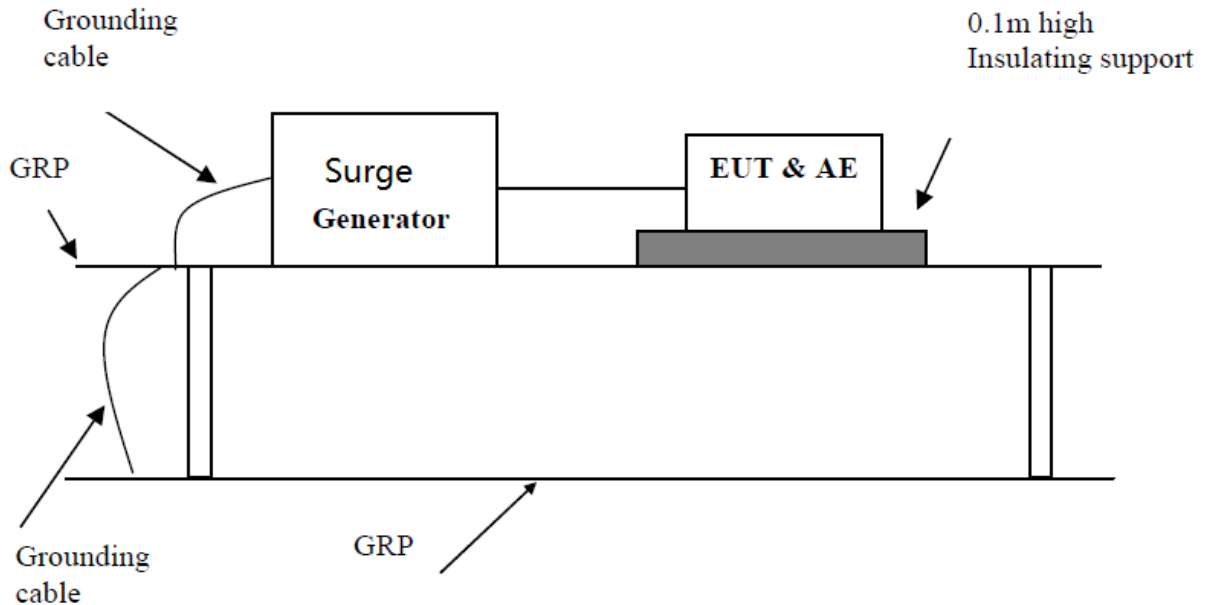
Temperature	:	°C
Relative humidity content	:	%
Air pressure	:	kPa

4.5.3 Results

N/A

4.6 Surge Immunity

4.6.1 Measurement procedure



1. The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The 1,2/50 μ s surge was to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be applied on the lines under test.
3. 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.

4.6.2 Test environment

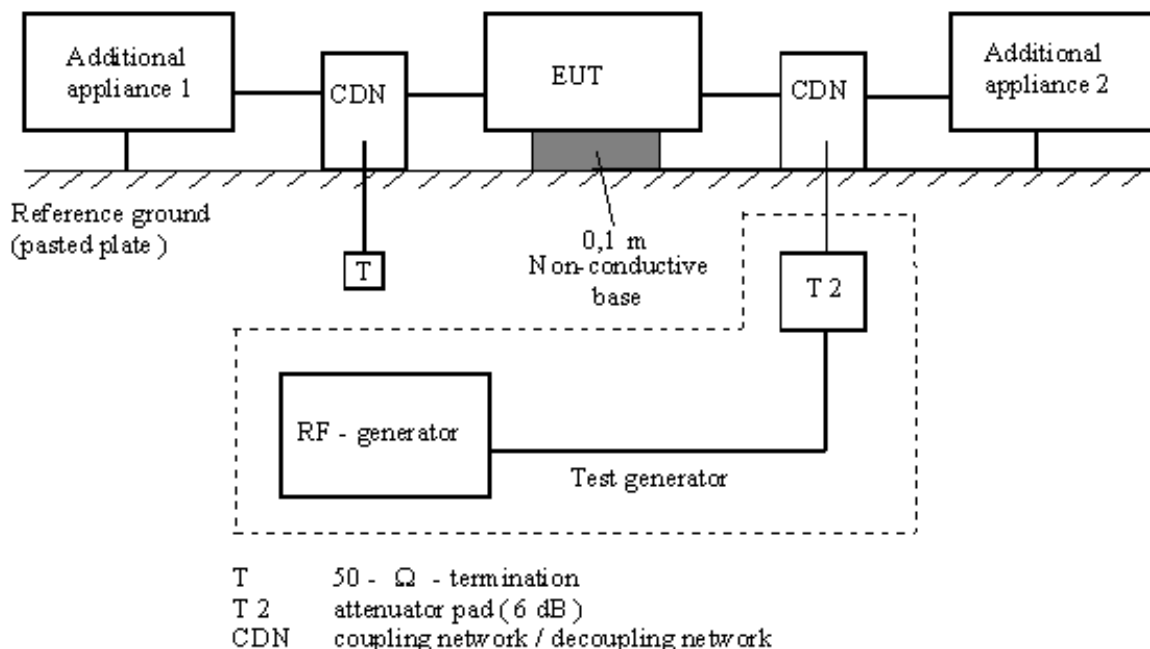
Temperature	:	°C
Relative humidity content	:	%
Air pressure	:	kPa

4.6.3 Results

N/A

4.7 Injected currents(RF continues conducted)

4.7.1 Measurement procedure



1. The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement. All cables exiting the EUT was supported at a height of at least 30 mm above the ground reference plane.
2. The coupling and decoupling devices were required, they were located between 0,1 m and 0,3 m from the EUT. This distance was to be measured horizontally from the projection of the EUT on to the ground reference plane to the coupling and decoupling device.
3. The frequency range was swept from 150 kHz to 80 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 change coupling devices as necessary. Where the frequency was swept incrementally, the step size do not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was not less than the time necessary for the EUT to be exercised and to respond, and was not less than 3s.

4.7.2 Test environment

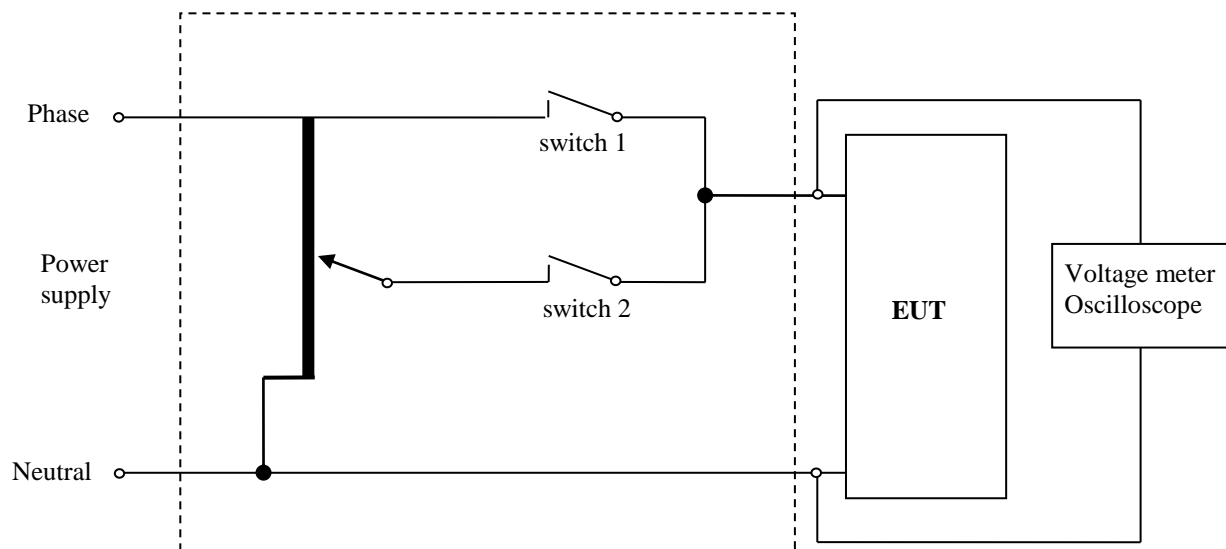
Temperature : °C
 Relative humidity content : %
 Air pressure : kPa

4.7.3 Results

N/A

4.8 Voltage dips and Interruption

4.8.1 Measurement procedure



1. The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0,1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.
2. The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. Voltage change shall occur at zero crossing.
3. The EUT was tested for each selected combination of test level and duration with a sequence of three dips /interruptions with intervals of 10 s minimum. Each representative mode of operation was tested.

4.8.2 Test environment

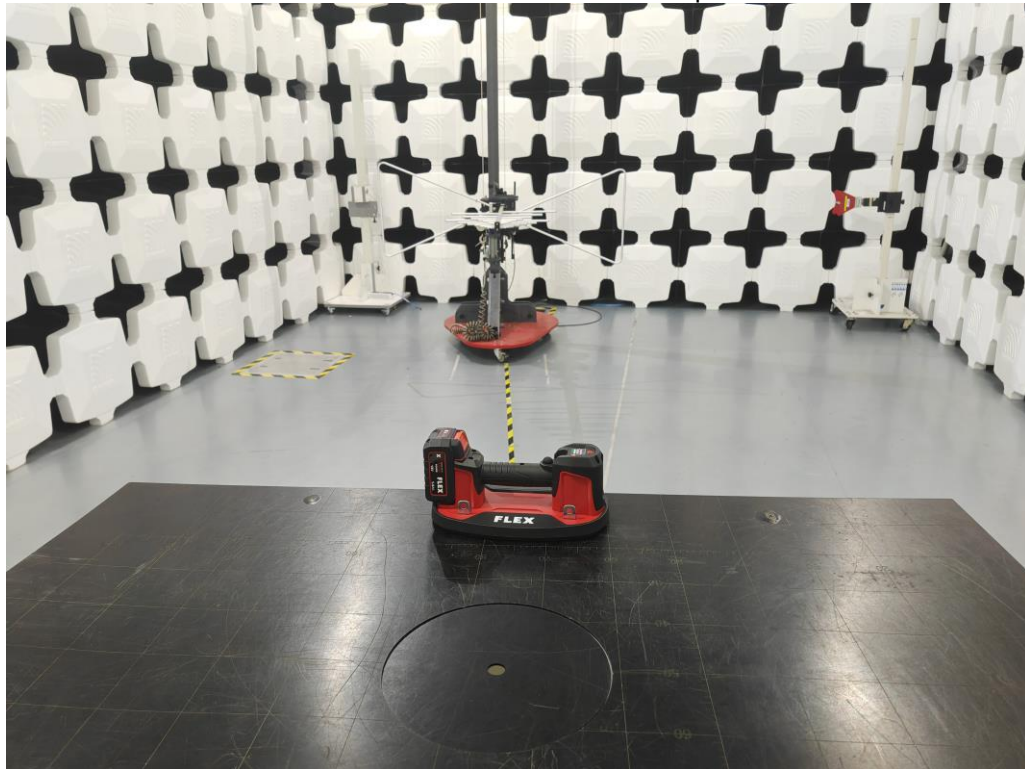
Temperature : °C
 Relative humidity content : %
 Air pressure : kPa

4.8.3 Results

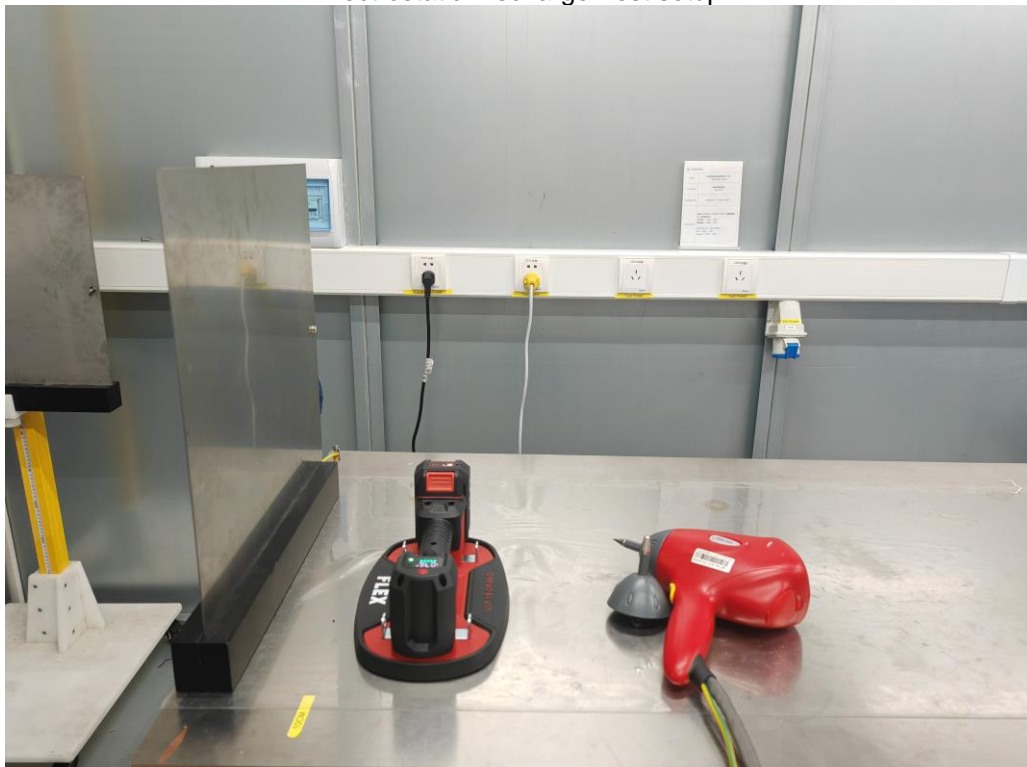
N/A

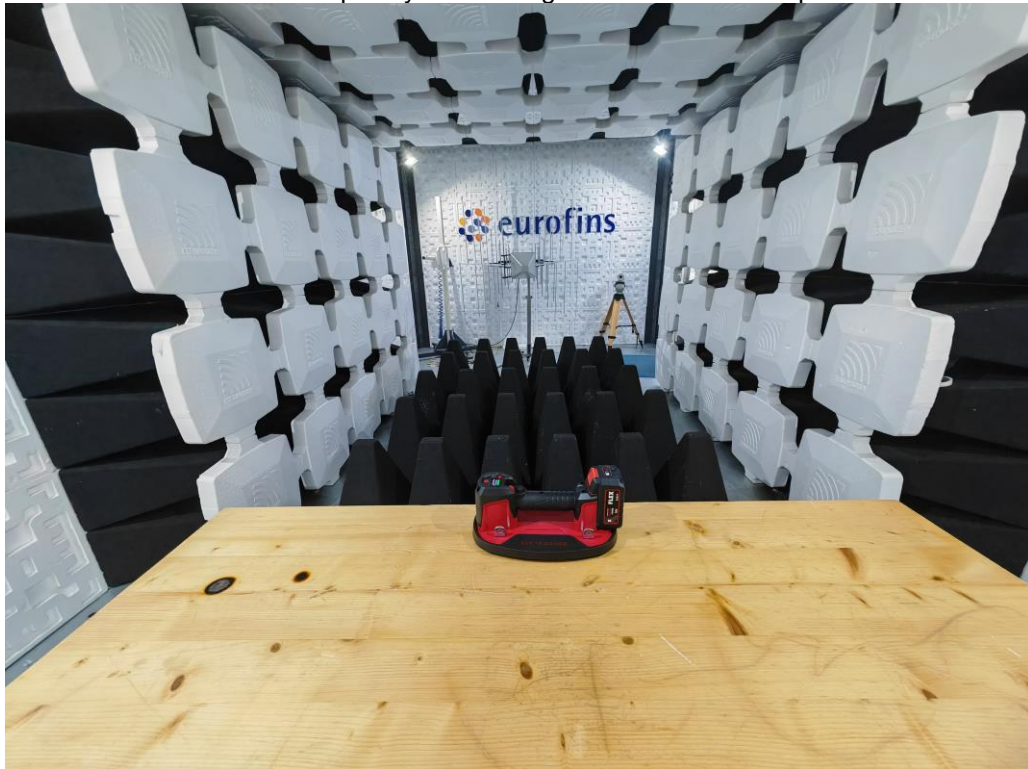
5 Test setup Photos

Radiated disturbance Test setup



Electrostatic Discharge Test setup





6 EUT Photos



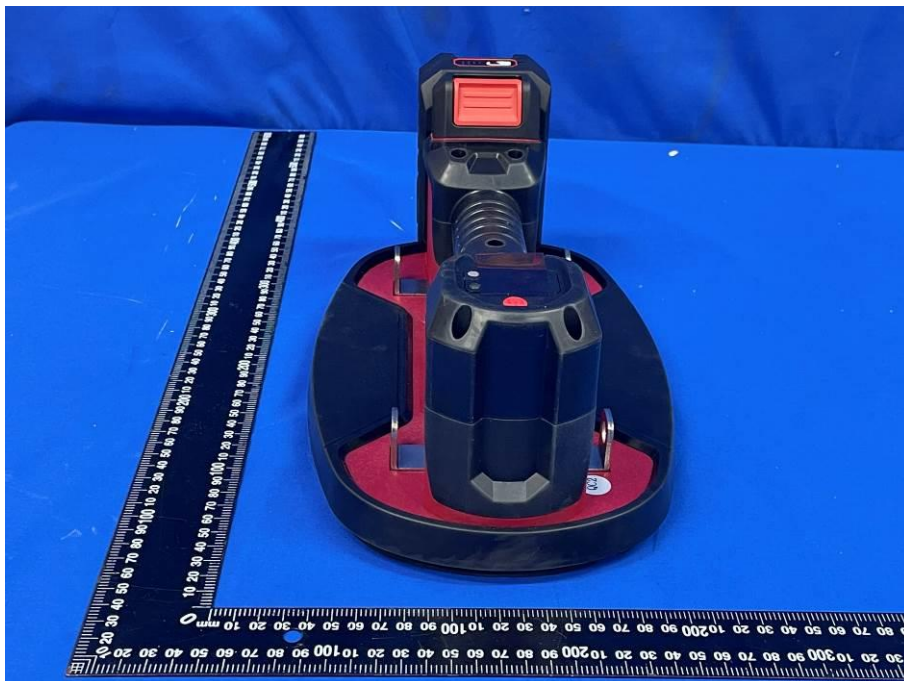
Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen,
Guangdong, China



Test Report No.: EFGX24010384-IE-02-E01

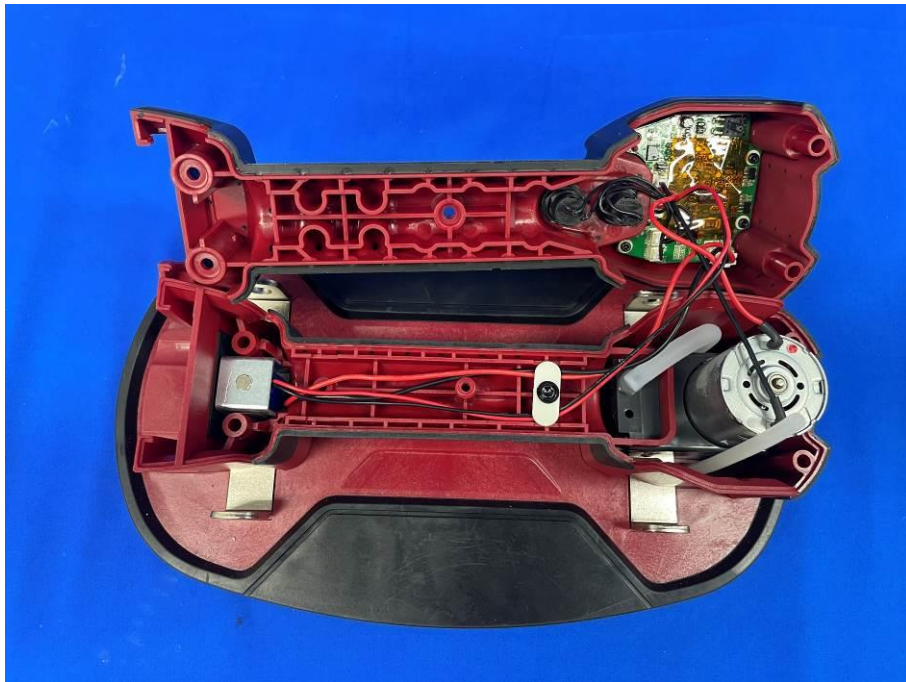
Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen,
Guangdong, China





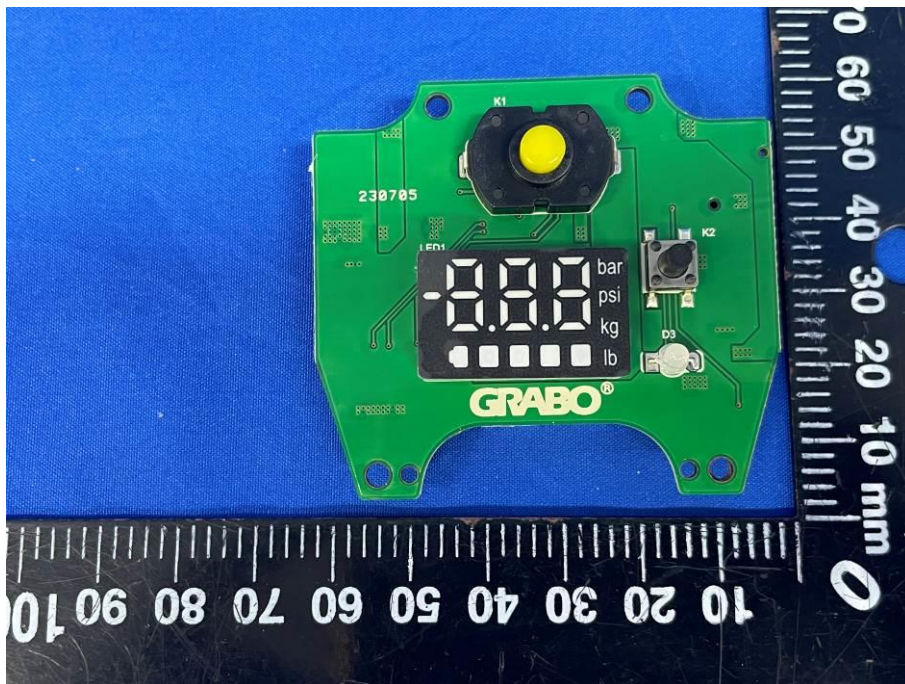
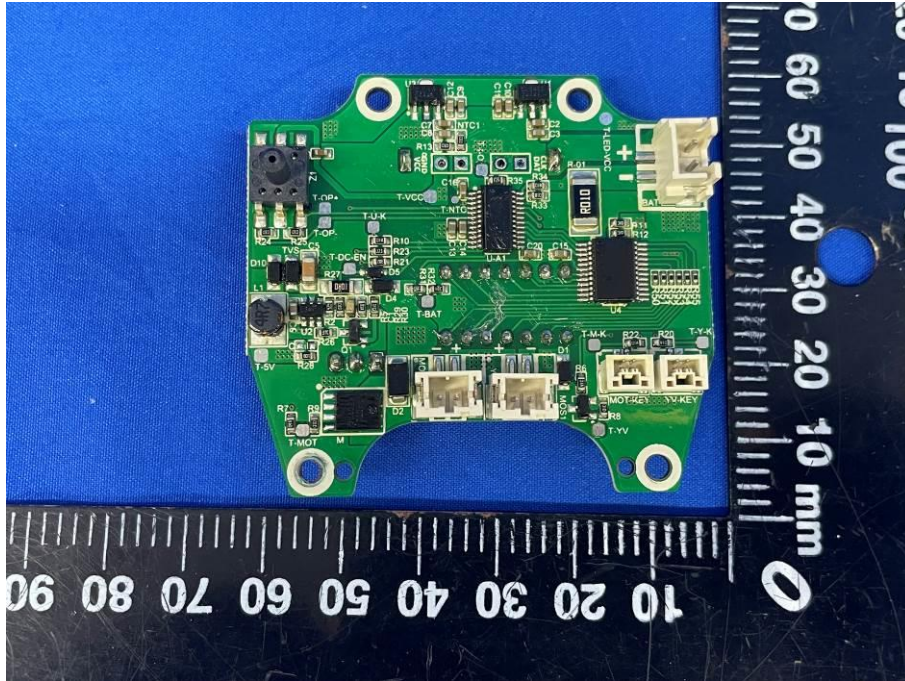
Test Report No.: EFGX24010384-IE-02-E01

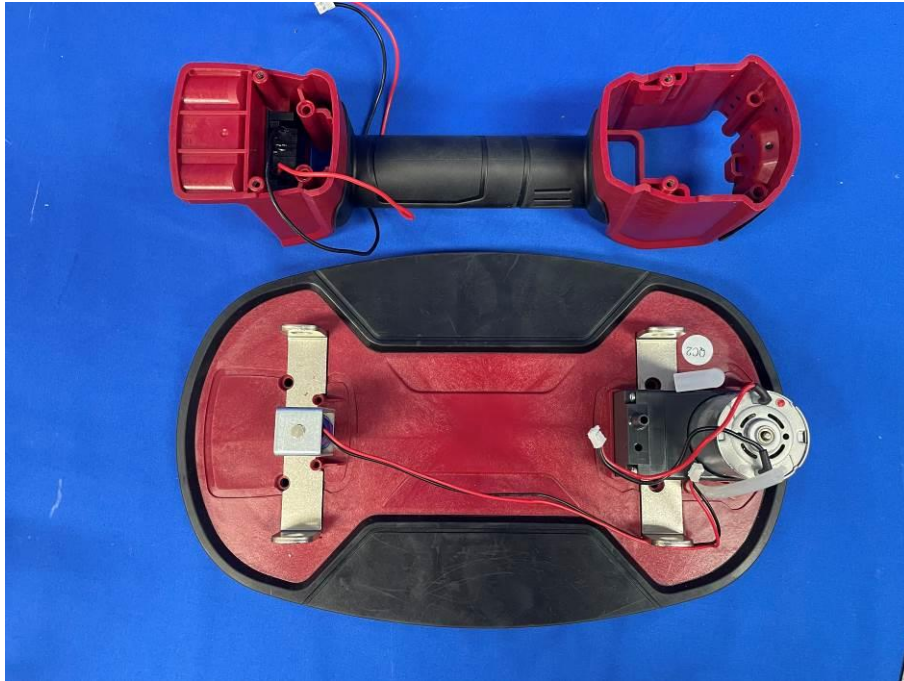
Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen,
Guangdong, China



Test Report No.: EFGX24010384-IE-02-E01

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
Room 20 of 2/F., 1/F., Building 2, Spring Block, Meishenghuigu Innovation Park, No.83, Dabao Road, Bao'an District, Shenzhen,
Guangdong, China





---End of Report---