



中国认可
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检测
TESTING
CNAS L4136



TEST REPORT

Reference No...... : WTH25H08217241E

Applicant..... : Shenzhen Meilan Technology Co., Ltd.
Room 501, Building 2, Hongji Road No. 20, Jiangnan Handbag

Address..... : Products Industrial Zone, Longxin Community, Longgang District,
Shenzhen City

Manufacturer..... : Shenzhen Meilan Technology Co., Ltd.
Room 501, Building 2, Hongji Road No. 20, Jiangnan Handbag

Address..... : Products Industrial Zone, Longxin Community, Longgang District,
Shenzhen City

Product Name..... : Neck massager

Model No...... : F50
EN IEC 55014-1: 2021, EN IEC 55014-2: 2021

Test specification..... : EN IEC 61000-3-2:2019+A1:2021,
EN 61000-3-3:2013+A2:2021

Date of Receipt sample..... : 2025-08-14

Date of Test..... : 2025-08-14 to 2025-08-19

Date of Issue..... : 2025-08-25

Test Report Form No...... : TRF EN IEC 55014-1: 2021-EMC-001-V01

Test Result..... : **Pass**

Prepared By:

Waltek Testing Group HCT (Shenzhen) Co., Ltd.

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1- GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Client Information

Applicant:	Shenzhen Meilan Technology Co., Ltd.
Address of applicant:	Room 501, Building 2, Hongji Road No. 20, Jiangnan Handbag Products Industrial Zone, Longxin Community, Longgang District, Shenzhen City
Manufacturer:	Shenzhen Meilan Technology Co., Ltd.
Address of manufacturer:	Room 501, Building 2, Hongji Road No. 20, Jiangnan Handbag Products Industrial Zone, Longxin Community, Longgang District, Shenzhen City

General Description of E.U.T

EUT Name:	Neck massager
Trade Mark:	N/A
Model No.:	F50
Operating Mode.:	Mode1: Charging Mode2: Working
Power Supply:	Input: DC 5V 0.6A 3W

Remark:

* The test data gathered are from the production sample provided by the manufacturer.



1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

EN IEC 55014-1: 2021

EN IEC 55014-2: 2021

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

EN 61000-3-3:2013+A2:2021

Reference Standards:

EN 61000-4-2:2009

EN IEC 61000-4-3:2020

EN 61000-4-4:2012

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

EN IEC 61000-4-6:2023

EN 61000-4-11:2020+AC:2022

The objective of the manufacturer is to demonstrate compliance with the described standards above.

1.3 Test Summary

Table 1:

Standard	Test Items	Status
EN IEC 55014-1: 2021	Conducted Emission (150kHz to 30MHz)	☒
	Disturbance Power (30MHz To 300MHz)	☐ (1)
	Radiated Disturbances (30MHz to 1000MHz)	☒

Note: ☒ Indicates that the test is applicable, ☐ Indicates that the test is not applicable

(1) EUT power supply is provided by DC.

Table 2:

Standard	Test Items	Status
EN IEC 61000-3-2:2019+A1:2021	Harmonic Current Test	☐ (1)
EN 61000-3-3:2013+A2:2021	Voltage Fluctuations and Flicker Test	☐ (1)

Note: ☒ Indicates that the test is applicable, ☐ Indicates that the test is not applicable

(1) EUT power supply is provided by DC.



Table 3:

Standard	Test Items	Status
EN IEC 55014-2: 2021	Test items as below listed	☒
EN 61000-4-2:2009	Electrostatic discharge Immunity	☒
EN IEC 61000-4-3:2020	Radiated Susceptibility (80MHz to 1GHz)	☒
EN 61000-4-4:2012	Electrical Fast Transient/Burst Immunity	☐ (1)
EN 61000-4-5:2014+A1:2017	Surge Immunity	☐ (1)
EN IEC 61000-4-6:2023	Conducted Susceptibility (150kHz to 230MHz)	☐ (1)
EN 61000-4-11:2020+AC:2022	Voltage Dips, Short Interruptions Immunity	☐ (1)

Note: ☒ Indicates that the test is applicable, ☐ Indicates that the test is not applicable
 (1) EUT power supply is provided by DC.

1.4 Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1: 2019 Radio disturbance and immunity measuring apparatus – Measuring apparatus, and CISPR 16-2-3: 2016+A1:2019, Method of measurement of disturbances and immunity.

1.5 Test Facility

The measurement required was performed at Building B, Tianji Industrial Park, 1/F. & 2/F. & 3/F., No.30-9, Laiyin Road, Xinsheng Community, Longgang Subdistrict, Longgang District, Shenzhen, Guangdong, China.

1.6 Version

Report No	Date of Issue	Description	Approved
WTH25H08217241E	2025-08-25	Original	Valid



2- SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being Charge

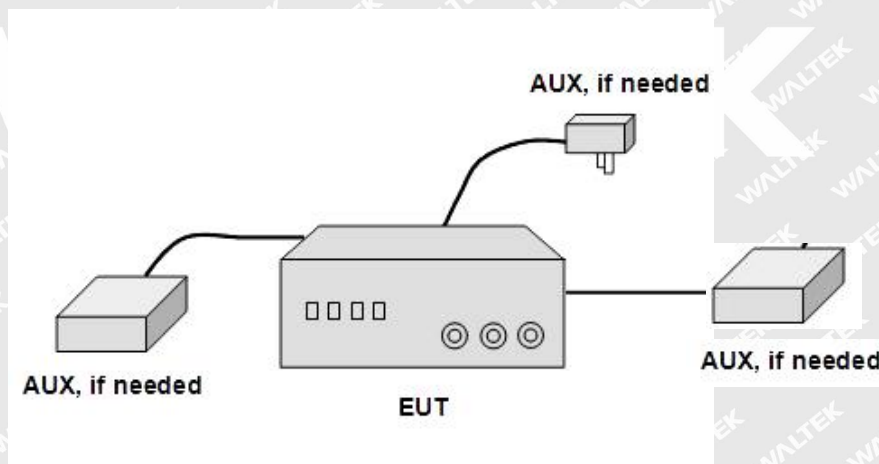
2.3 Equipment Modifications

The EUT tested was not modified by HCT.

2.4 Basic Configuration of Test System

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.





2.5 General Description of Test Auxiliary

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Adapter	HUAWEI	050200C01	/
/	/	/	/

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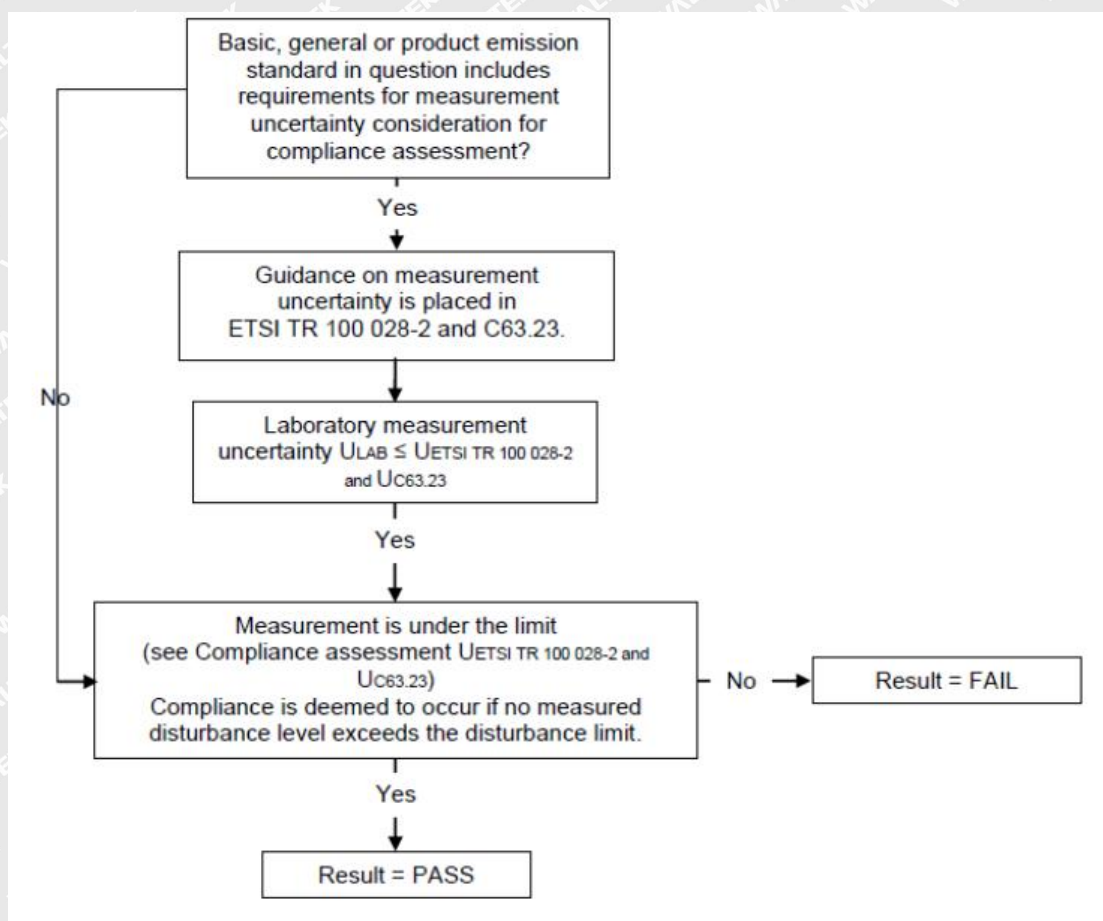
2.6 Application of decision rule

Application of decision rule and statement of conformity is defined in document CNAS-GL015

Decision rule and measurement uncertainty.

As a general rule Pass/Fail decisions are based on simple acceptance rule and acceptance limits chosen based on simple acceptance ($w = 0$, $AL = TL$) except if a decision rule is governed by particular standard or guidance document.

Decision rule:





3- CONDUCTED DISTURBANCE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN. The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.7 dB.

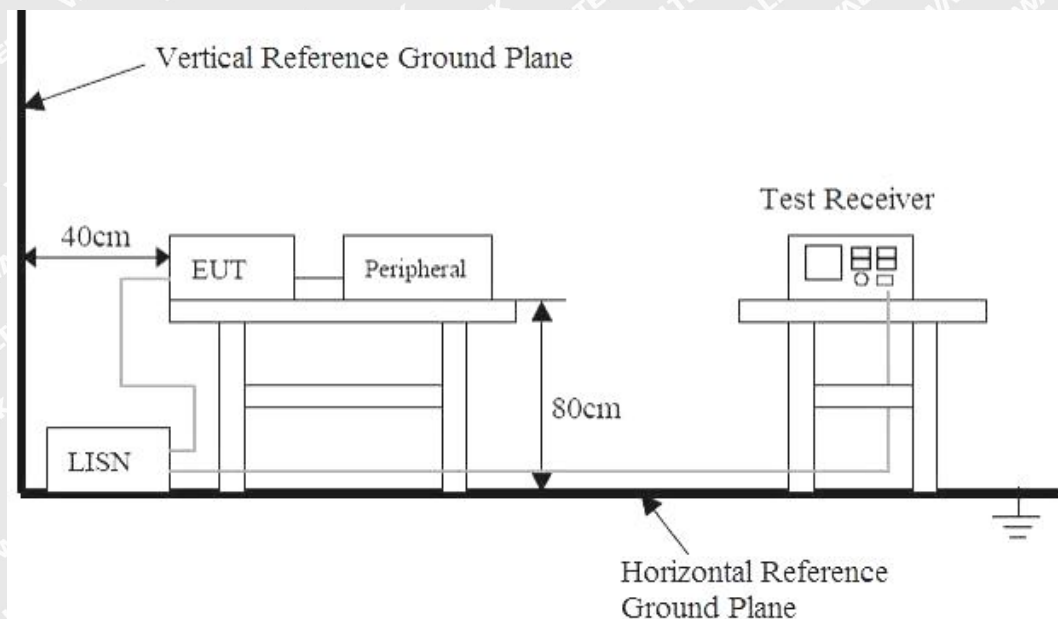
3.2 Limit of Conducted Disturbance at The Mains Terminals

Frequency Range (MHz)	Equipment Limits	
	Quasi-Peak (dBuV)	Average (dBuV)
0.150~0.500	66~56	59~46
0.500~5.000	56	46
5.000~30.00	60	50

NOTE 1: The tighter limit shall apply at the edge between two frequency bands.

NOTE 2: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.3 EUT Setup



The setup of EUT is according with CISPR 16-1-1: 2019, CISPR 16-2-3: 2016+A1:2019 measurement procedure. The specification used was the EN 55014-1 limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final



result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
 Detector.....Peak & Quasi-Peak & Average
 Sweep Speed.....Auto
 IF Band Width.....9 KHz

3.5 Test Procedure

1. During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.
2. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.
3. All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".

3.6 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1004A1-003	EMI Test Receiver	R&S	ESCI 3	100687	2025-01-03	2026-01-02
2	WTHE1011A1-001	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	8128249	2025-01-15	2026-01-14
3	WTHE1010A1-001	10dB attenuator	SCHWARZBECK	9561-F061	8360009	2025-01-02	2026-01-01
Software List							
Description		Manufacturer		Model		Version	
Test Software		Farad		EZ-EMC		EMEC-3A1	
*Remark: indicates software version used in the compliance certification testing							



3.7 Test Data

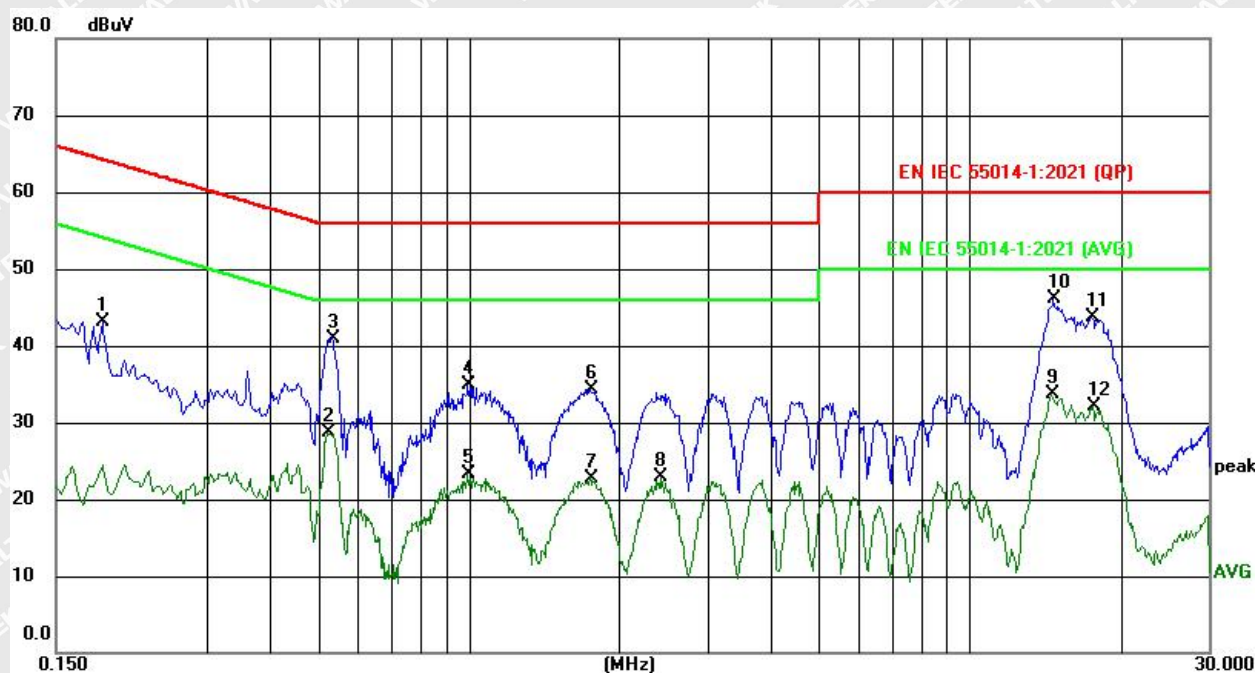
Temperature:	24 (°C)
Humidity:	55 (%RH)
Atmospheric pressure:	101 (kPa)
Operating Mode:	Mode1
Test Result:	Pass

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Conducted Emission Test

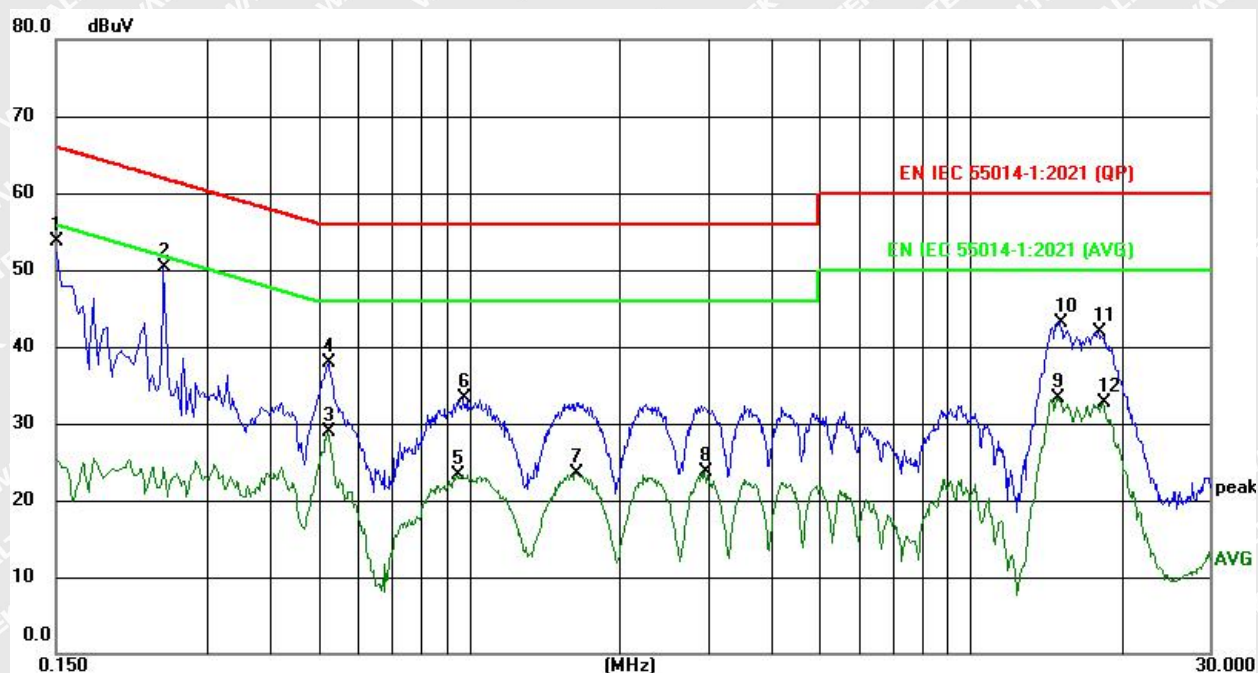
EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode1
Test Site:	Shielded Room
Test Voltage:	DC 5V from Adapter input AC 230V/50Hz
Comment:	Live Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1860	33.60	9.58	43.18	64.21	-21.03	QP	
2		0.5220	18.91	9.76	28.67	46.00	-17.33	AVG	
3		0.5340	31.23	9.77	41.00	56.00	-15.00	QP	
4		0.9980	24.80	10.08	34.88	56.00	-21.12	QP	
5		0.9980	13.14	10.08	23.22	46.00	-22.78	AVG	
6		1.7460	24.26	10.11	34.37	56.00	-21.63	QP	
7		1.7460	12.69	10.11	22.80	46.00	-23.20	AVG	
8		2.4180	12.80	10.17	22.97	46.00	-23.03	AVG	
9		14.5460	23.28	10.45	33.73	50.00	-16.27	AVG	
10	*	14.7180	35.56	10.45	46.01	60.00	-13.99	QP	
11		17.5459	33.25	10.47	43.72	60.00	-16.28	QP	
12		17.6380	21.54	10.47	32.01	50.00	-17.99	AVG	

**Conducted Emission Test**

EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode1
Test Site:	Shielded Room
Test Voltage:	DC 5V from Adapter input AC 230V/50Hz
Comment:	Neutral Line



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1500	44.14	9.51	53.65	66.00	-12.35	QP	
2	*	0.2460	40.75	9.61	50.36	61.89	-11.53	QP	
3		0.5220	19.23	9.76	28.99	46.00	-17.01	AVG	
4		0.5260	28.18	9.76	37.94	56.00	-18.06	QP	
5		0.9460	13.28	10.05	23.33	46.00	-22.67	AVG	
6		0.9740	23.17	10.06	33.23	56.00	-22.77	QP	
7		1.6340	13.37	10.17	23.54	46.00	-22.46	AVG	
8		2.9580	13.43	10.24	23.67	46.00	-22.33	AVG	
9		14.8980	22.60	10.65	33.25	50.00	-16.75	AVG	
10		15.0820	32.54	10.65	43.19	60.00	-16.81	QP	
11		17.9460	31.23	10.73	41.96	60.00	-18.04	QP	
12		18.3300	21.91	10.74	32.65	50.00	-17.35	AVG	



4- DISTURBANCE POWER IN THE FREQUENCY RANGE

4.1 Measurement Uncertainty

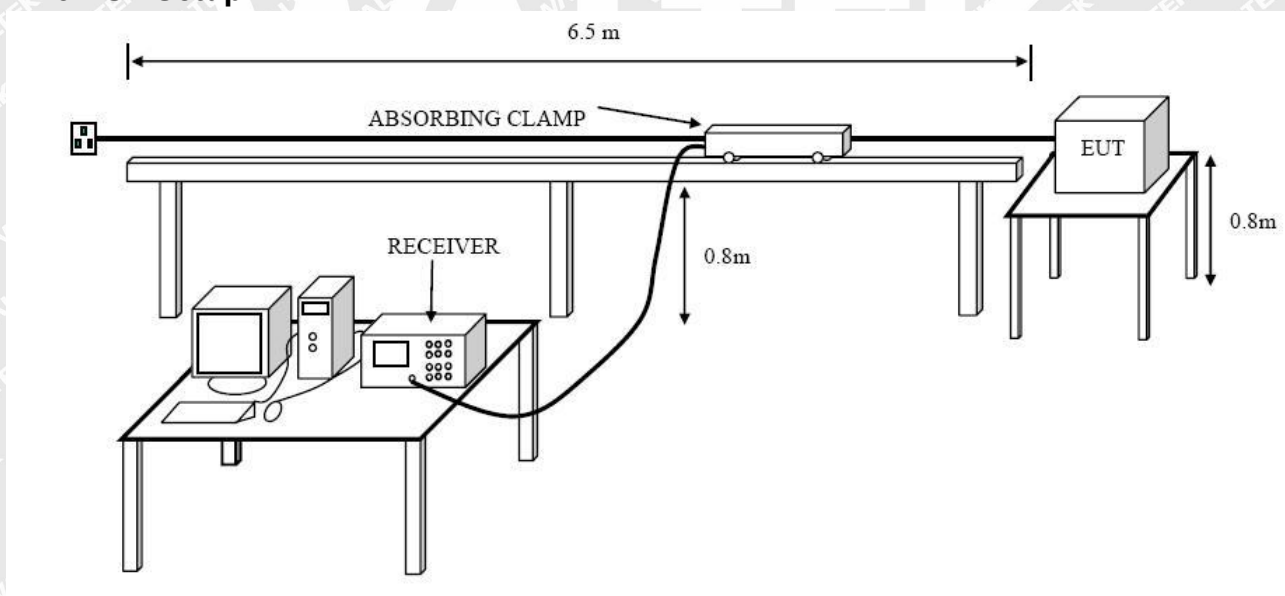
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and ISN. The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.4 dB.

4.2 Limit of Disturbance Power

Frequency Range (MHz)	Household and similar appliances Limit (dBpW)		Tool					
			Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding 1000W		Rated motor power above 1000W	
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
30~300	45 ~ 55	35 ~ 45	45 ~ 55	35 ~ 45	49 ~ 59	39~49	55 ~ 65	45~55

Note: 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.

4.3 EUT Setup





4.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....30 MHz to 300 MHz
 Detector.....Peak & Quasi-Peak & Average
 Sweep Speed.....Auto
 IF Band Width.....120 KHz

4.5 Test Procedure

The associated equipment under test is placed on a non-metallic table of 0.8 m of height above the floor and at least 0.4 m from other objects and from any person. The lead to be measured shall be stretched in a straight horizontal line for a length sufficient to accommodate the absorbing clamp and to permit the necessary adjustment of its position for tuning. The absorbing clamp is placed around the lead to be measured, with its current transformer towards the equipment under test, so as to measure a quantity proportional to the disturbance power on the lead.

Any other lead less than that to be measured shall either be disconnected, if mechanically and functionally possible, or fitted with ferrite rings to attenuate RF currents which may affect the measurement results. Such a lead shall be stretched away from the connected unit in a direction perpendicular to the direction of the lead to be measured.

All connectors not used shall be left un-terminated. All connectors having a connected lead shall be terminated in a manner representative of use. If the leads are screened and normally terminated in a screened unit, then the termination shall be screened.

4.6 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1004A1-003	EMI Test Receiver	R&S	ESCI3	100687	2025-01-03	2026-01-02
2	WTHE1015A1-001	Power Clamp	SCHWARZBECK	MDS-21	3812	2025-01-07	2026-01-06
3	WTHE1042A1-001	6dB Attenuator	Agilent	DGA9552n	8491A	2025-06-18	2026-06-17
Software List							
Description		Manufacturer		Model		Version	
Test Software		Farad		EZ-EMC		EMEC-3A1	
*Remark: indicates software version used in the compliance certification testing							



4.7 Test Data

Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/

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5- RADIATED DISTURBANCES

5.1 Measurement Uncertainty

Test Site: 3m SAC

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is as below table.

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U _{CISPR}
Radiated Emissions, 3m	30-6000MHz	4.5 dB	6.3 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 32 and CISPR 11 (for 2006 and later revisions) Clause 11.

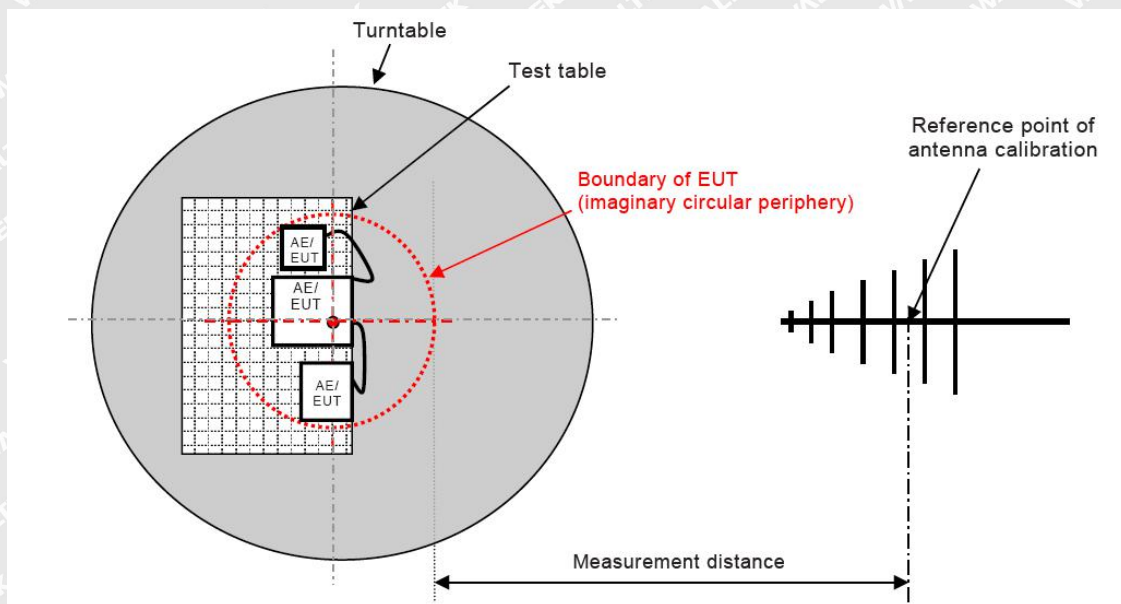
5.2 Limit of Radiated Disturbances

Below 1GHz Equipment Limits		
Frequency (MHz)	Distance (Meters)	Quasi-Peak (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47
NOTE 1: The lower limit shall apply at the transition frequency.		
NOTE 2 : Additional provisions may be required for cases where interference occurs.		

Above 1GHz Class B Equipment Limits			
Frequency (GHz)	Distance (Meters)	Average (dB μ V/m)	Peak (dB μ V/m)
1 ~ 3	3	50	70
3 ~ 6	3	54	74
NOTE 1 The lower limit shall apply at the transition frequency.			



5.3 EUT Setup



The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the CISPR 16-1-1: 2019, CISPR 16-2-3: 2016+A1:2019. The specification used was EN IEC 55014-1: 2021

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

5.4 Test Receiver Setup

According to EN IEC 55014-1: 2021 rules, the frequency was investigated from 30 to 1000 MHz. During the radiated emission test, the test receiver was set with the following configurations:

Detector.....	Peak & Quasi-Peak
IF Band Width.....	120KHz
Frequency Range.....	30MHz to 1000MHz
Turntable Rotated.....	0 to 360 degrees

Antenna Position:

Height.....	1m to 4m
Polarity.....	Horizontal and Vertical



5.5 Test Procedure

1. Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.
2. All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μ V of specification limits), and are distinguished with a "QP" in the data table.

5.6 Corrected Amplitude & Margin Calculation

Sample Calculation:

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor

in dB AG = Amplifier

Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added.

The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in V/m.

$$RA = 52.0$$

$$\text{dB}\mu\text{V AF} =$$

$$7.4 \text{ dB/m}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = 32 \text{ dB}\mu\text{V/m}$$

To convert from dB μ V to μ V or mV the following was used: $UF = 10^{(NF / 20)}$

where UF = Net Reading in μ V

NF = Net Reading in dB μ V



5.7 Test Data

Temperature:	24 (°C)
Humidity:	55 (%RH)
Atmospheric pressure:	101 (kPa)
Operating Mode:	Mode1/Mode2
Test Result:	Pass

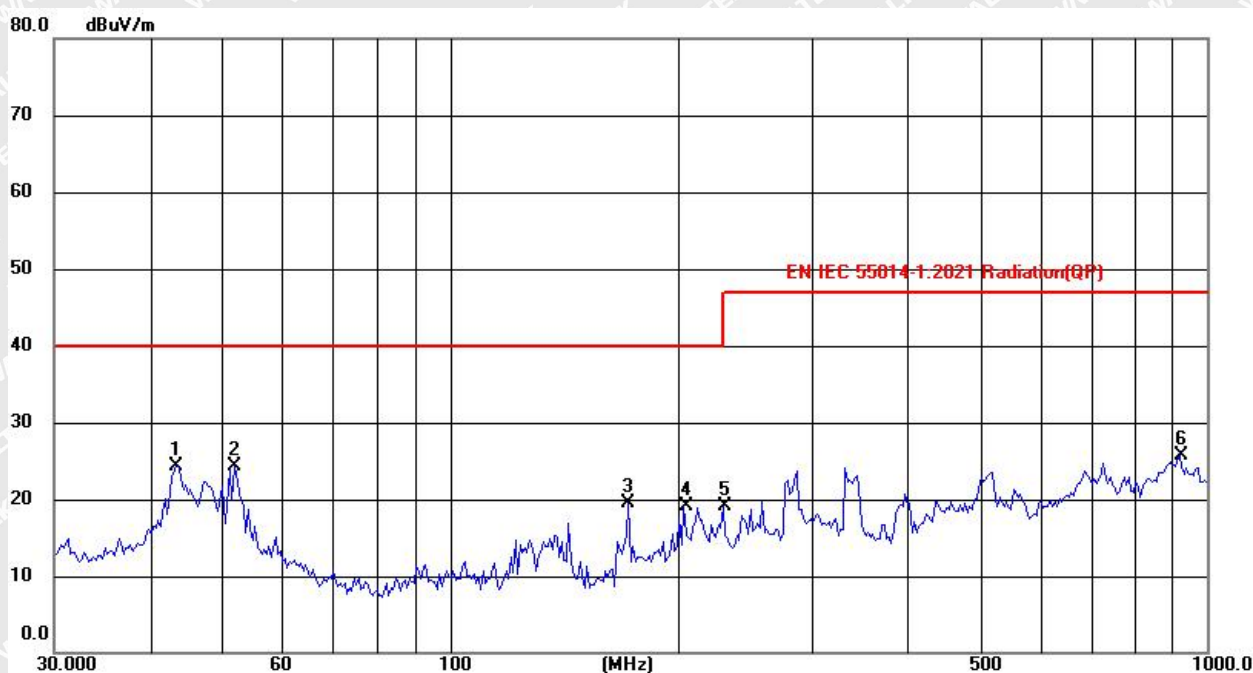
5.8 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1004A1-001	EMI Test Receiver	R&S	ESPI7	100097	2025-01-03	2026-01-02
2	WTHE1005A2-004	Broadband Logarithmic Period Antenna	SCHWARZBECK	VULB 9162	280	2025-02-08	2026-02-07
3	WTHE1006A1-002	Preamplifier	Agilent	8447D	1937A02492	2025-01-03	2026-01-02
Software List							
Description		Manufacturer		Model		Version	
Test Software		Farad		EZ-EMC		EMEC-3A1	
*Remark: indicates software version used in the compliance certification testing							



Radiated Emission Test Data of Below 1GHz

EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode1
Test Site:	3m CHAMBER
Test Voltage:	DC 5V from Adapter input AC 230V/50Hz
Comment:	Polarization: Vertical

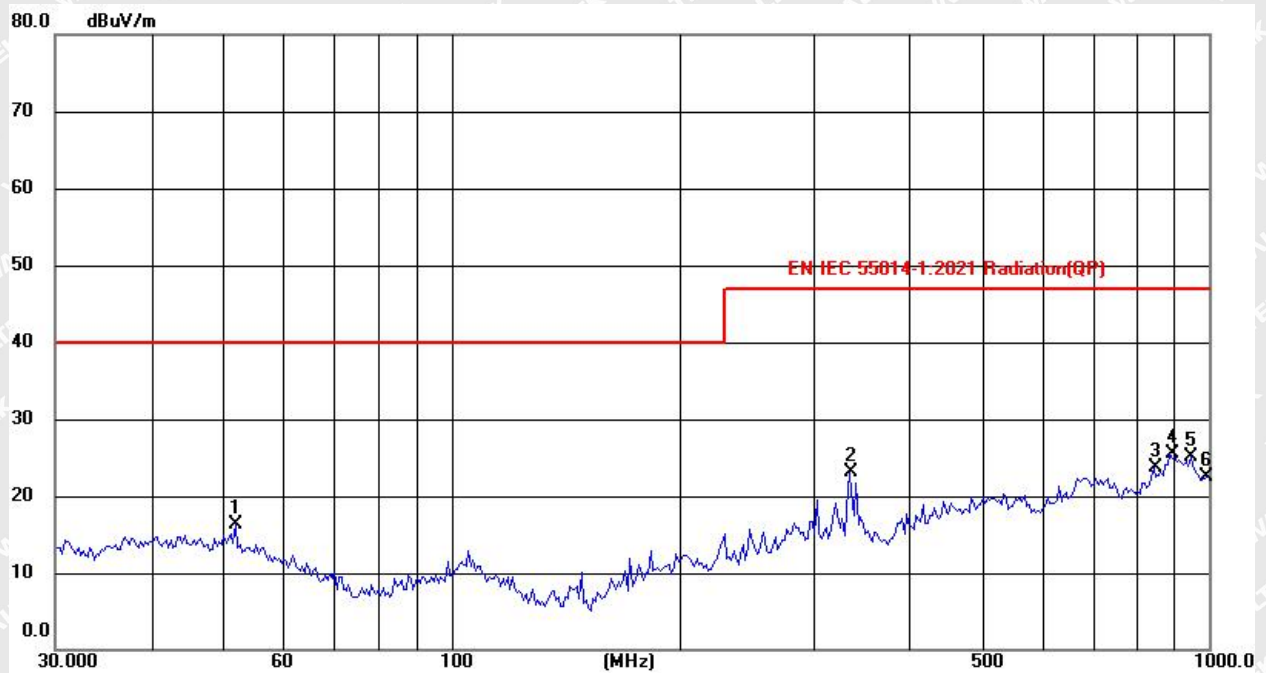


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		43.5057	36.22	-11.96	24.26	40.00	-15.74	QP			
2	*	51.8430	36.44	-12.08	24.36	40.00	-15.64	QP			
3		171.9946	38.20	-18.63	19.57	40.00	-20.43	QP			
4		203.5228	34.88	-15.80	19.08	40.00	-20.92	QP			
5		229.2931	33.76	-14.65	19.11	40.00	-20.89	QP			
6		919.2866	26.93	-1.20	25.73	47.00	-21.27	QP			



Radiated Emission Test Data of Below 1GHz

EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode1
Test Site:	3m CHAMBER
Test Voltage:	DC 5V from Adapter input AC 230V/50Hz
Comment:	Polarization: Horizontal

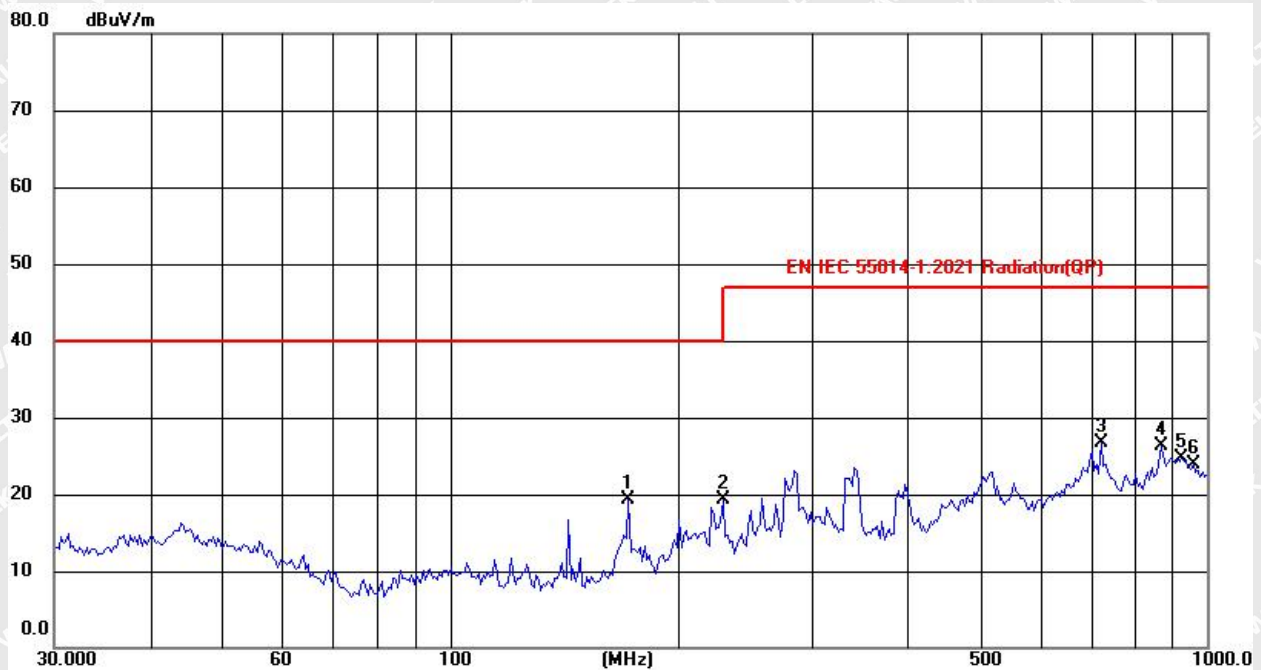


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		51.8430	30.14	-13.74	16.40	40.00	-23.60	QP		
2		334.8589	33.89	-10.76	23.13	47.00	-23.87	QP		
3		845.0878	25.22	-1.47	23.75	47.00	-23.25	QP		
4	*	887.6099	26.15	-0.58	25.57	47.00	-21.43	QP		
5		945.4399	24.99	0.03	25.02	47.00	-21.98	QP		
6		993.0114	22.46	0.05	22.51	47.00	-24.49	QP		



Radiated Emission Test Data of Below 1GHz

EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode2
Test Site:	3m CHAMBER
Test Voltage:	DC 3.7V
Comment:	Polarization: Vertical

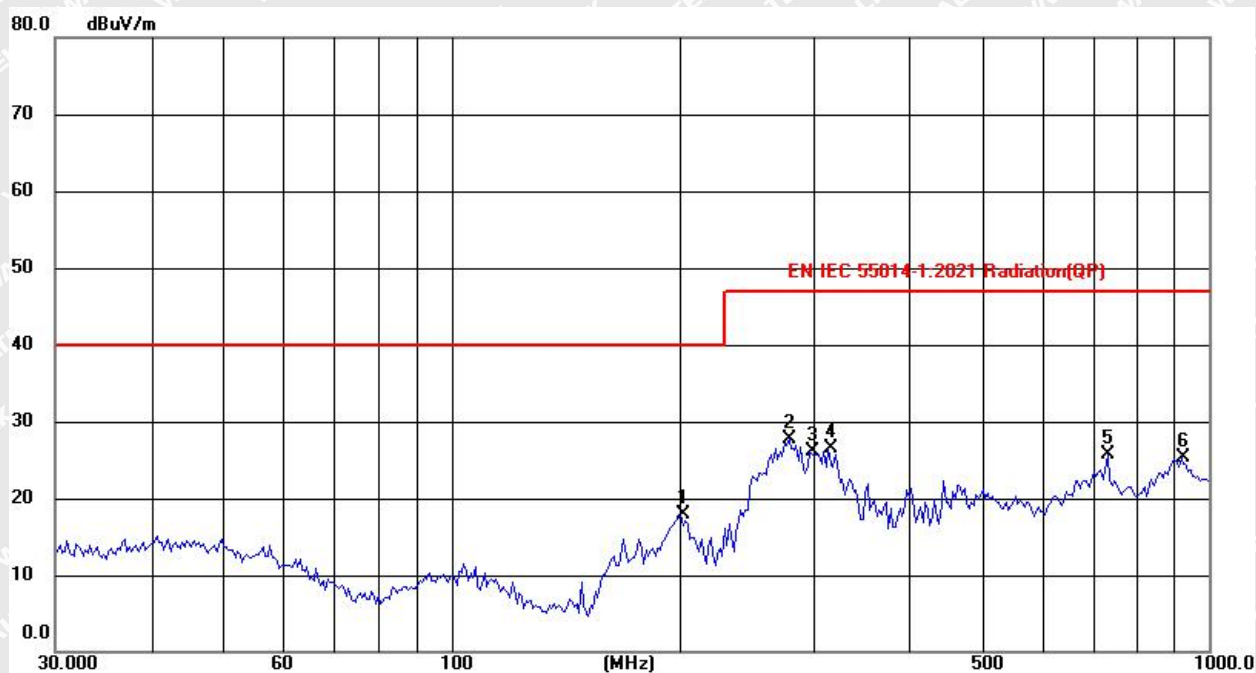


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1		171.9946	37.90	-18.63	19.27	40.00	-20.73			QP	
2		229.2930	33.94	-14.65	19.29	40.00	-20.71			QP	
3	*	724.2610	30.48	-3.83	26.65	47.00	-20.35			QP	
4		869.1302	28.64	-2.28	26.36	47.00	-20.64			QP	
5		925.7562	26.06	-1.33	24.73	47.00	-22.27			QP	
6		958.7943	26.00	-2.04	23.96	47.00	-23.04			QP	



Radiated Emission Test Data of Below 1GHz

EUT:	Neck massager
M/N:	F50
Operating Mode:	Mode2
Test Site:	3m CHAMBER
Test Voltage:	DC 3.7V
Comment:	Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		200.6881	32.60	-14.63	17.97	40.00	-22.03	QP		
2	*	279.0436	39.76	-12.09	27.67	47.00	-19.33	QP		
3		297.2241	37.64	-11.50	26.14	47.00	-20.86	QP		
4		314.3765	37.54	-11.13	26.41	47.00	-20.59	QP		
5		734.4913	28.56	-2.87	25.69	47.00	-21.31	QP		
6		919.2866	25.38	-0.10	25.28	47.00	-21.72	QP		

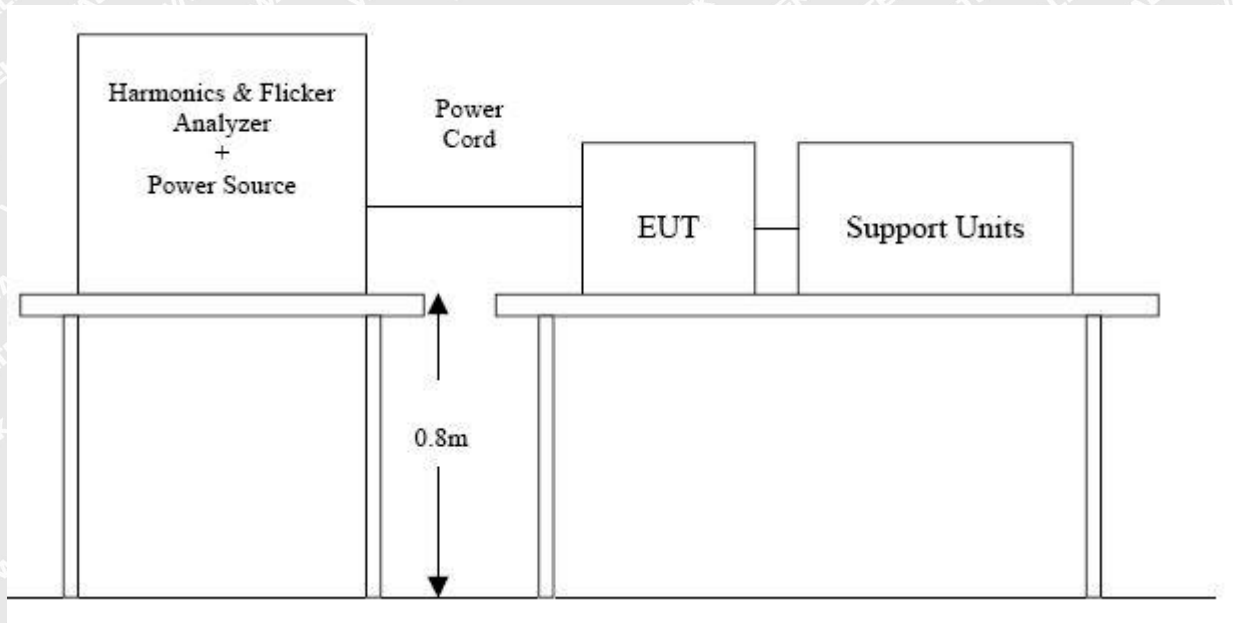


6– HARMONIC CURRENT TEST

6.1 Application of Harmonic Current Emission

Compliance to these standards ensures that tested equipment will not generate harmonic currents at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

6.2 Block Diagram of Test Setup:



6.3 Test Procedure:

1. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
2. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.



6.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1064A1-001	HARMONICS&FLICKER ANALYSER	TESEQ	CCN1000-1	1133A01498 CTS	2025-05-28	2026-05-27
2	WTHE1065A1-001	5KV AC power source	TESEQ	NSG1007	1133A01498	2025-06-25	2026-06-24
Software List							
Description		Manufacturer		Model		Version	
Test Software		CTS		CTS4		V4.30.0	
*Remark: indicates software version used in the compliance certification testing							

6.5 Test Result

Basic Standard:	EN IEC 61000-3-2:2019+A1:2021
Observation time:	150s
Windows width:	10 periods - (EN 61000-4-7 Edition 2000)
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/



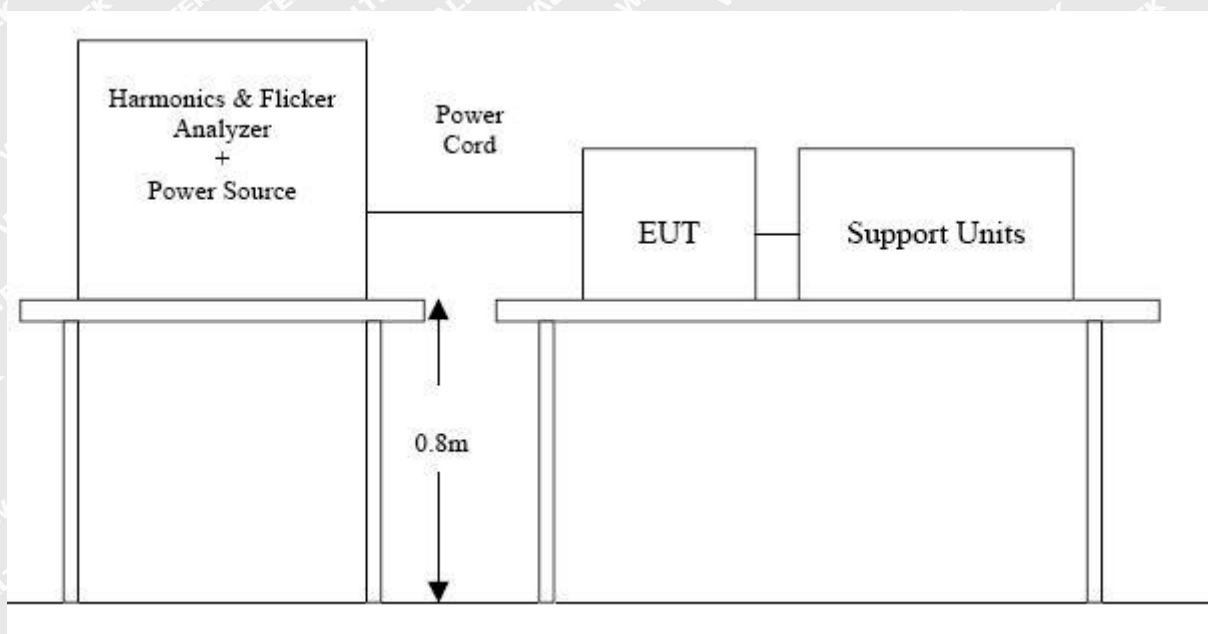
7 – VOLTAGE FLUCTUATIONS AND FLICKER TEST

7.1 Application and Limit of Voltage Fluctuations and Flicker Test

Compliance to these standards ensures that tested equipment will not generate flickers and voltage change at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

Test Item	Limit	Remark
Pst	1.0	Pst means short-term flicker indicator.
Plt	0.65	Plt means long-term flicker indicator.
Tdt (ms)	500	Tdt means maximum time that dt exceeds 3 %.
dmax (%)	4%	dmax means maximum relative voltage change.
dc (%)	3.3%	dc means relative steady-state voltage change

7.2 Block Diagram of Test Setup:





7.3 Test Procedure:

1. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
2. During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

7.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1064A1-001	HARMONICS&FLICKER ANALYSER	TESEQ	CCN1000-1	1133A01498 CTS	2025-05-28	2026-05-27
2	WTHE1065A1-001	5KV AC power source	TESEQ	NSG1007	1133A01498	2025-06-25	2026-06-24
Software List							
Description		Manufacturer		Model		Version	
Test Software		CTS		CTS4		V4.30.0	
*Remark: indicates software version used in the compliance certification testing							

7.5 Test Result

Basic Standard:	EN 61000-3-3:2013+A2:2021
Short time (Pst)	10 min
Observation time	10 min (1 Flicker measurement)
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/



8- IMMUNITY TEST DESCRIPTION

8.1 General Description

Product Standard	EN 55014-2	
Basic Standard, Specification, and Performance Criterion required	EN 61000-4-2	Electrostatic Discharge – ESD: $\pm 8\text{kV}$ air discharge, $\pm 4\text{kV}$ Contact discharge, Performance Criterion B
	EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test – RS: 80 ~ 1000 MHz, 3V/m, 80% AM (1kHz), Performance Criterion A
	EN 61000-4-4	Electrical Fast Transient/Burst - EFT, Power line: $\pm 1\text{kV}$, Signal line: $\pm 0.5\text{kV}$, Performance Criterion B
	EN 61000-4-5	Surge Immunity Test: 1.2/50 μs Open Circuit Voltage, 8 /20 μs Short Circuit Current, Power Line: line to line $\pm 1\text{ kV}$, line to ground $\pm 2\text{ kV}$ Signal line: line to ground: outdoor: 1kV indoor: $\pm 0.5\text{kV}$ Performance Criterion B
	EN 61000-4-6	Conducted Radio Frequency Disturbances Test – CS: 0.15 ~ 230 MHz, 3Vrms, 80% AM, 1kHz, Performance Criterion A
	EN 61000-4-11	Voltage Dips: 1) 0% residual for 0.5 cycle, Performance Criterion C 2) 40% residual for 10 cycles(50Hz), 12 cycles(60Hz), Performance Criterion C 3) 70% residual for 25 cycles(50Hz), 30 cycles(60Hz), Performance Criterion C



8.2 The phenomena allowed during and after test in each criterion are clearly stated in the following table

Performance criteria		
Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 2). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 2).

NOTE 1:
Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2:
No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

8.3 Deviations from the standard

No deviations from EN 55014-2 were made when performing the tests described in this report.



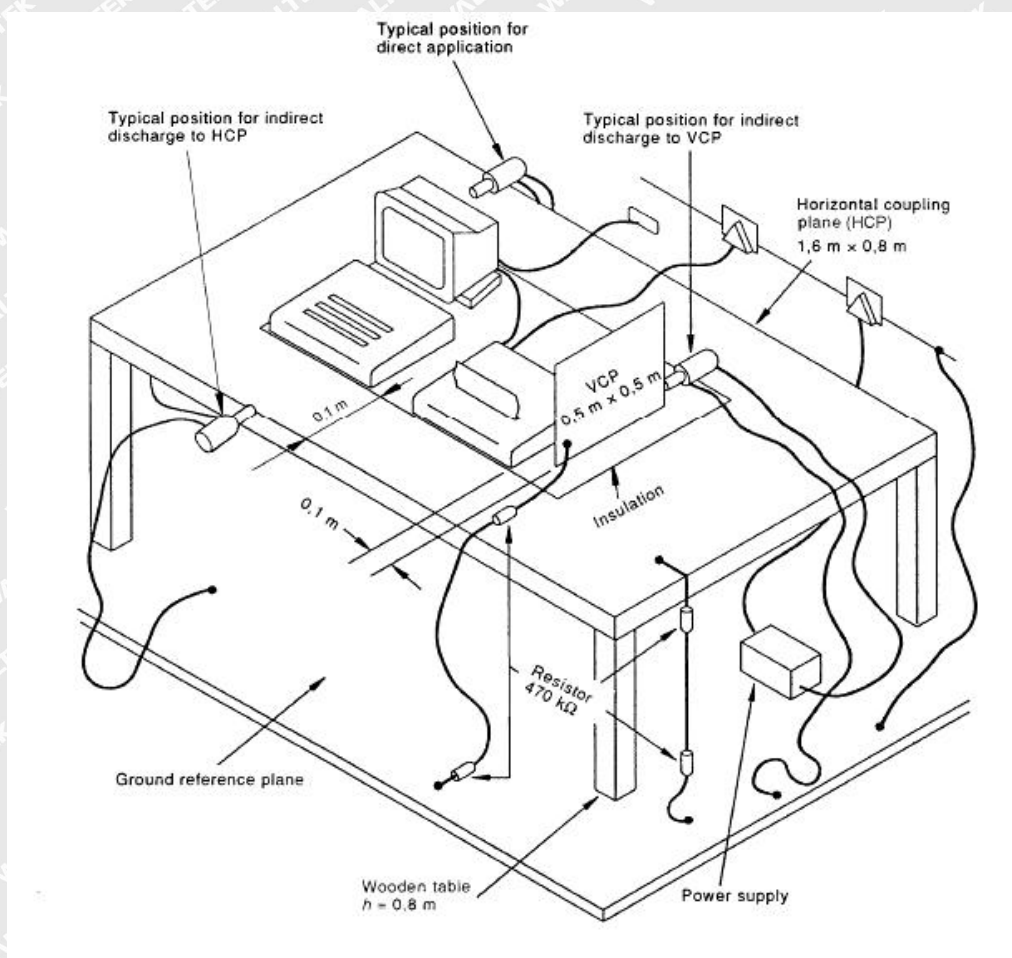
9- IMMUNITY TEST RESULTS

9.1 Electrostatic Discharge Immunity Test

9.1.1 Test Specification

Basic Standard:	EN 61000-4-2:2009
Test Level:	± 8 kV (Air Discharge) ± 4 kV (Contact Discharge) ± 4 kV (Indirect Contact HCP) ± 4 kV (Indirect Contact VCP)
Temperature:	24 (°C)
Humidity:	55 (%RH)
Atmospheric pressure:	101(kPa)
Operating Mode:	Mode1
Test Result:	Pass

9.1.2 Test Setup





9.1.3 Test Procedure

1. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during Full load.
2. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
3. The time interval between two successive single discharges was at least 1 second.
4. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
5. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
6. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
7. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned horizontally at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
8. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

9.1.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1039A1-001	Electrostatic Discharge Simulator	Prima	ESD61002 TC	PR1611 21302	2025-07-23	2026-07-22

9.1.5 Performance Criterion Required & Test Result

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Level			Test Points	Observation Performance	Criterion Required
±2 kV	±4kV	±8kV			
☐	☐	☒	Gap	A	B
☐	☐	☒	Button	A	B
☐	☐	☒	Plastic casing	A	B



Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Level			Test Points	Observation Performance	Criterion Required
± 2 kV	± 4 kV	± 8 kV			
☐	☒	☐	USB-C	A	B
☐	☒	☐	Massage electrode plate	A	B

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

Test Level			Test Points	Observation Performance	Criterion Required
± 2 kV	± 4 kV	± 8 kV			
☐	☒	☐	Front Side	A	B
☐	☒	☐	Back Side	A	B
☐	☒	☐	Left Side	A	B
☐	☒	☐	Right Side	A	B

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Level			Test Points	Observation Performance	Criterion Required
± 2 kV	± 4 kV	± 8 kV			
☐	☒	☐	Front Side	A	B
☐	☒	☐	Back Side	A	B
☐	☒	☐	Left Side	A	B
☐	☒	☐	Right Side	A	B

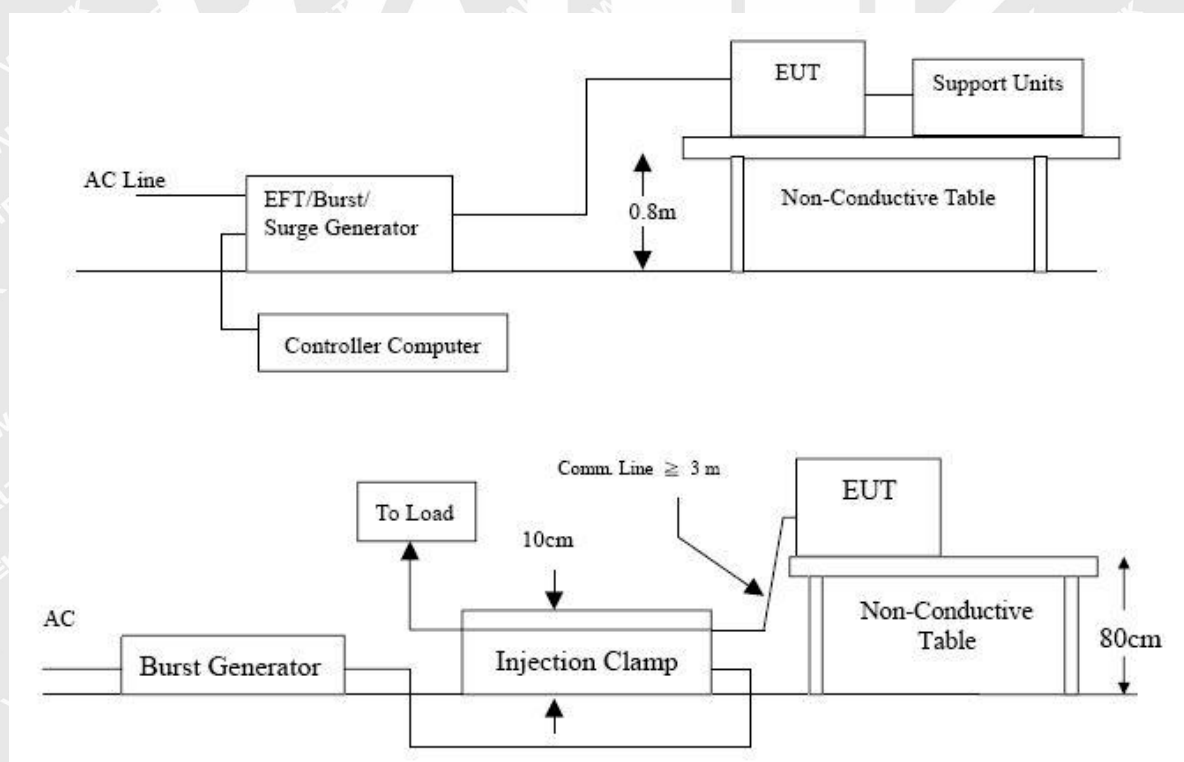


9.2 Electrical Fast Transient/Burst Immunity Test

9.2.1 Test Specification

Basic Standard :	EN 61000-4-4:2012
Test Level:	±1 kV for AC Power Line ±0.5 kV for Communication Line (If applicable)
Impulse Frequency:	5kHz
Impulse Wave-shape:	5/50ns
Burst Duration:	15ms
Burst Period:	300ms
Test Duration:	1 min.
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/

9.2.2 Test Setup





9.2.3 Test Procedure

1. Both positive and negative polarity discharges were applied.
2. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should be 0.5m.
3. The duration time of each test sequential was 1 minute.
4. The field strength level was 3V/m.
5. The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

9.2.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1017A1-001	Fast Transient Burst Generator	SCHAFFNER	MODULA6150	34572	2025-01-02	2026-01-01
Software List							
Description		Manufacturer		Model		Version	
Test Software		SCHAFFNER		System Modula		Ver. 2.57	
*Remark: indicates software version used in the compliance certification testing							

9.2.5 Performance Criterion Required & Test Result

Voltage	Test Points	Observation Performance	Criterion Required
±1kV	L	/	/
±1kV	N	/	/
±1kV	Earth	/	/
±1kV	L+N	/	/
±1kV	L + Earth	/	/
±1kV	N + Earth	/	/
±1kV	L+N+Earth	/	/
±0.5kV	Control Line	/	/
±0.5kV	DSL (RJ11)	/	/
±0.5kV	LAN (RJ45)	/	/

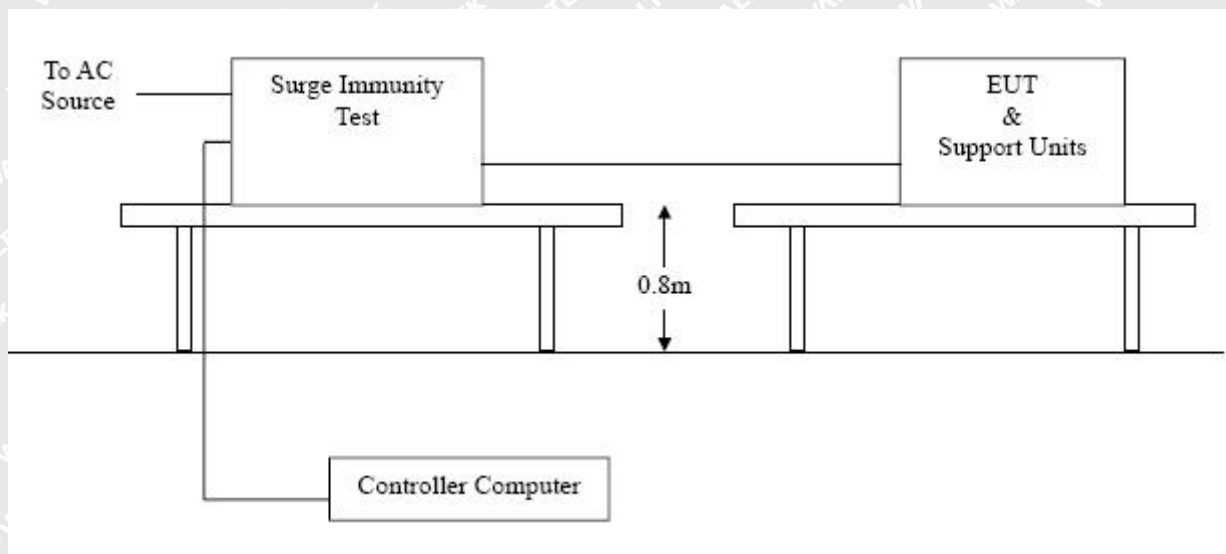


9.3 Surge Immunity Test

9.3.1 Test Specification

Basic Standard :	EN 61000-4-5:2014+A1:2017
Test Level:	± 1 kV (Line to Line) for AC Power Line $\pm 1, 2$ kV (Line(s) to Ground) for AC Power Line ± 0.5 kV for unshielded unsymmetrically operated interconnection lines (If applicable)
Wave-Shape:	Combination Wave 1.2/50 μ s Open Circuit Voltage 8/20 μ s Short Circuit Current
Generator Impedance:	42 ohm between signal line and ground 2 ohm between networks
Phase Angle:	90°/270°
Pulse Repetition Rate:	1 time / min
Number of Tests:	5 positive and 5 negative at selected points
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/

9.3.2 Test Setup





9.3.3 Test Procedure

1. For EUT power supply:

The surge is applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are 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. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

2. For test applied to unshielded unsymmetrically operated interconnection lines of EUT: (If applicable)

The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

9.3.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1025A1-001	10KV/Telecom Surge Generator	Lioncel	LSG-510CB	LSG51DCB 0170402	2025-01-02	2026-01-01
2	WTHE1025A1-004	Surge Three-Phase Coupled Network	Lioncel	CF5033P	CF5033PO 170401	2025-01-02	2026-01-01

9.3.5 Performance Criterion Required & Test Result

Voltage	Test Points	Observation Performance	Criterion Required
±1kV	L-N	/	/
±2kV	L-PE, N-PE	/	/
±2kV	L-PE, N-PE	/	/
±0.5kV	Control Line	/	/
±0.5kV	DSL (RJ11)	/	/
±0.5kV	LAN (RJ45)	/	/

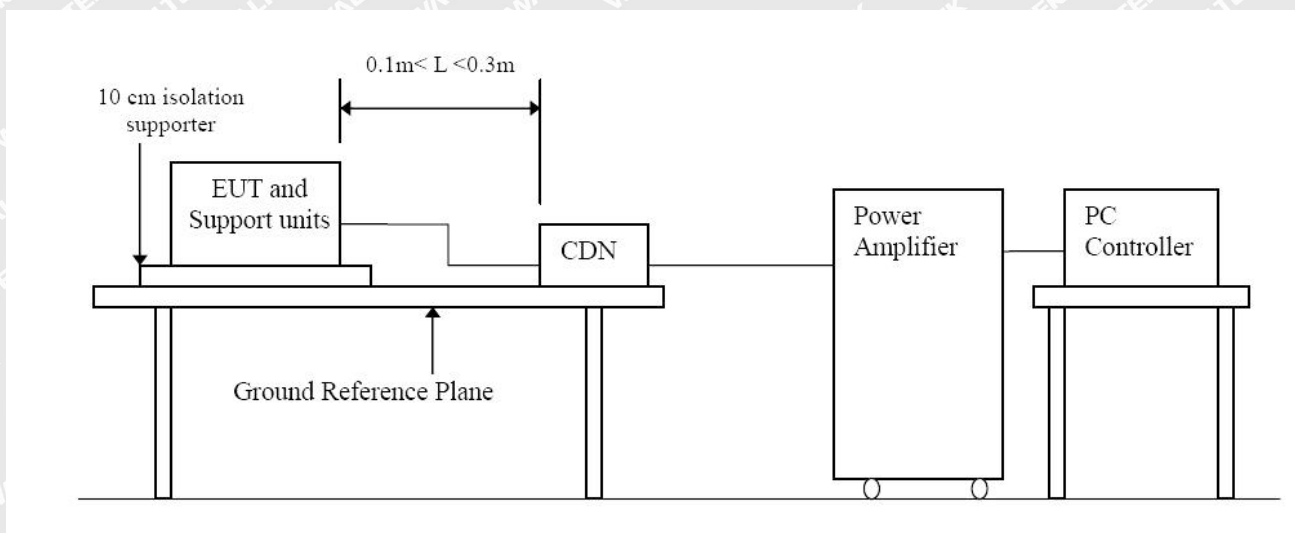


9.4 Conducted Susceptibility Test

9.4.1 Test Specification

Basic Standard:	EN IEC 61000-4-6:2023
Test Level:	3Vr.m.s
Frequency Range:	0.15~230MHz (MHz)
Modulation:	Amplitude 80%, 1kHz sinewave
Frequency Step:	1 % of preceding frequency value
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/

9.4.2 Test Setup



9.4.3 Test Procedure

1. The test was 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.
2. The frequency range was swept from 150 kHz to 230 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was 1.5×10^{-3} decades/s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value from 150 kHz to 230 MHz.
3. The dwell time at each frequency was less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, was analyzed separately.



4. Attempts was made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.

9.4.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1020A1-001	RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A1109	2025-01-02	2026-01-01
2	WTHE1021A1-001	CDN	FRANKONIA	CDN M2+M3	A3027019	2025-01-02	2026-01-01
3	WTHE1014A1-002	6dB Attenuator	FRANKONIA	N/A	1001698	2025-01-02	2026-01-01
4	WTHE1022A1-001	RF signal generator	MARCONI INSTRUMENTS	10S/6625-99-457-8730	1122601042	2025-01-02	2026-01-01
Software List							
Description		Manufacturer		Model		Version	
Test Software		Worldwide		SW1006		1.16	
*Remark: indicates software version used in the compliance certification testing							

9.4.5 Performance Criterion Required & Test Result

Frequency Band (MHz)	Voltage (Vrms)	Test Points	Observation Performance	Criterion Required
/	/	/	/	/

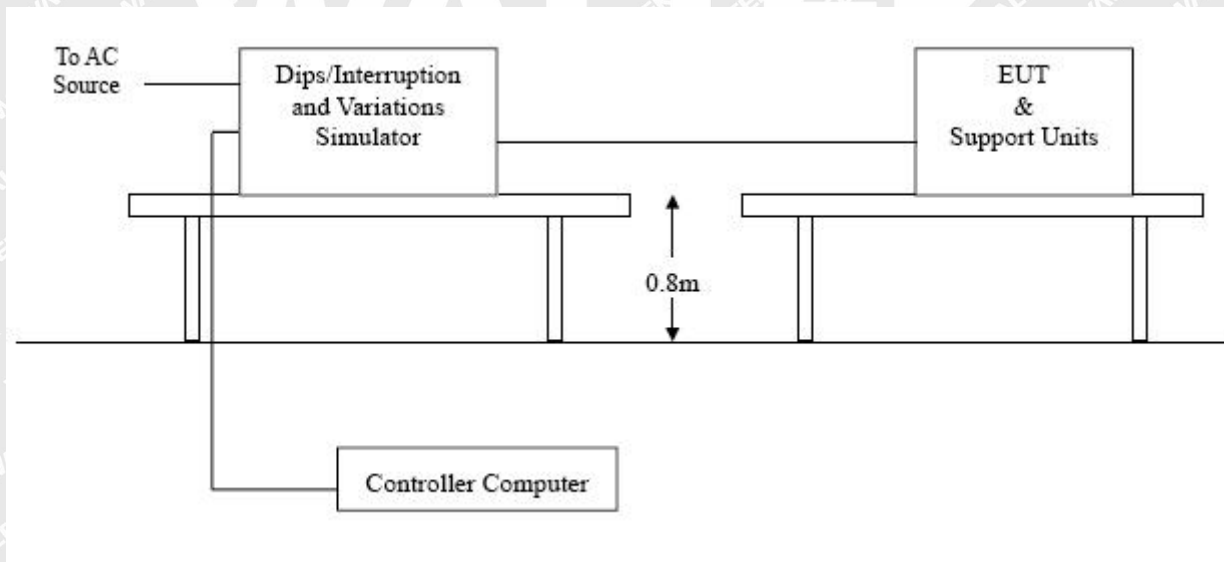


9.5 Voltage Dips, Short Interruptions Immunity Tests

9.5.1 Test Specification

Basic Standard:	EN 61000-4-11:2020+AC:2022
Test Level:	Voltage Dips: 1) 0% residual voltage for 0.5 cycle for 50/60Hz. 2) 70% residual voltage for 10/12 cycles for 50/60Hz. Voltage Interruptions: 3) 0% residual voltage for 25/30 cycles for 50/60Hz.
Interval between event:	10 seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°
Test cycle:	3 times
Temperature:	/
Humidity:	/
Atmospheric pressure:	/
Operating Mode:	/
Test Result:	/

9.5.2 Test Setup



9.5.3 Test Procedure

The EUT was tested for each selected combination of test levels and duration with a sequence of 3 dips/interruptions with intervals of 10s (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.



9.5.4 Test Equipment List and Details

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHE1027A1-001	Surge/Dips Generator	Thermo Scientific	TRA2000	0902262	2025-01-03	2026-01-02

9.5.5 Performance Criterion Required & Test Result

Ut: 230V AC, 50Hz			
Voltage (% Residual)	Duration (Period)	Observation Performance	Criterion Required
0	0.5	/	/
40	10	/	/
70	25	/	/

Ut: 230V AC, 60Hz			
Voltage (% Residual)	Duration (Period)	Observation Performance	Criterion Required
0	0.5	/	/
40	12	/	/
70	30	/	/

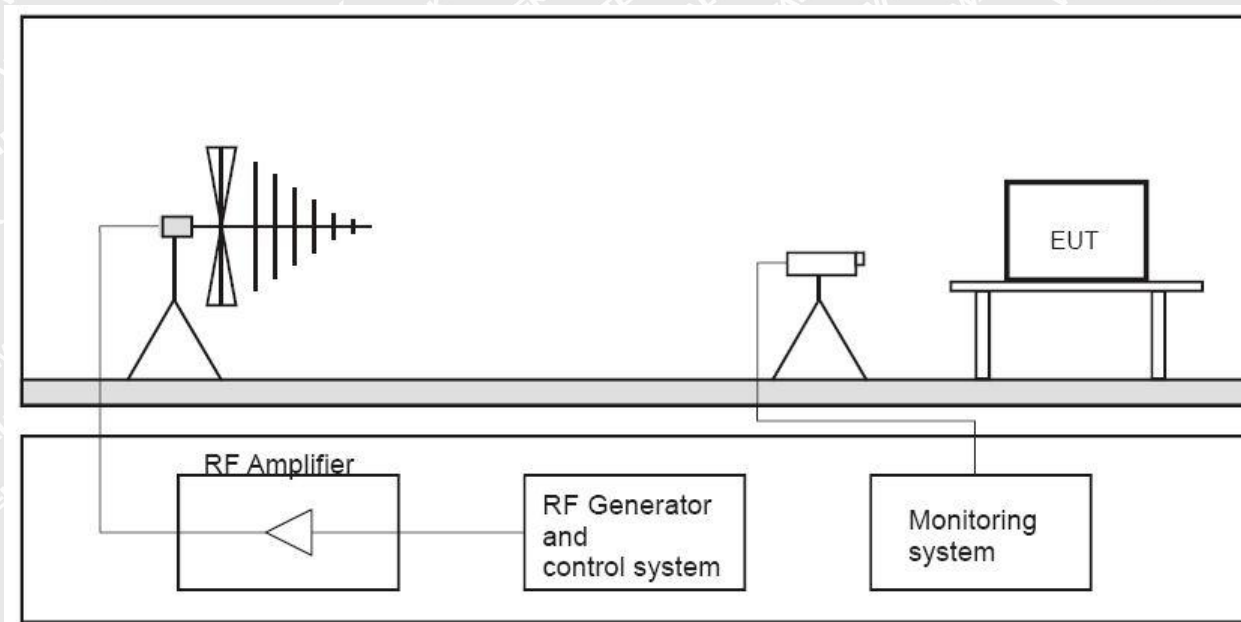


9.6 Radiated Susceptibility Test

9.6.1 Test Specification

Basic Standard:	EN IEC 61000-4-3:2020
Frequency Range:	80~1000MHz
Modulation:	Amplitude 80%, 1kHz sinewave
Test Level:	3V/m
Temperature:	24(°C)
Humidity:	55 (%RH)
Atmospheric pressure:	101 (kPa)
Operating Mode:	Mode1
Test Result:	Pass

9.6.2 Test Setup



9.6.3 Test Procedure

1. The testing was performed in a fully-anechoic chamber.
2. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave.
3. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0,5s.
4. The field strength level was 3V/m.
5. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.



9.6.4 Test Equipment List and Details

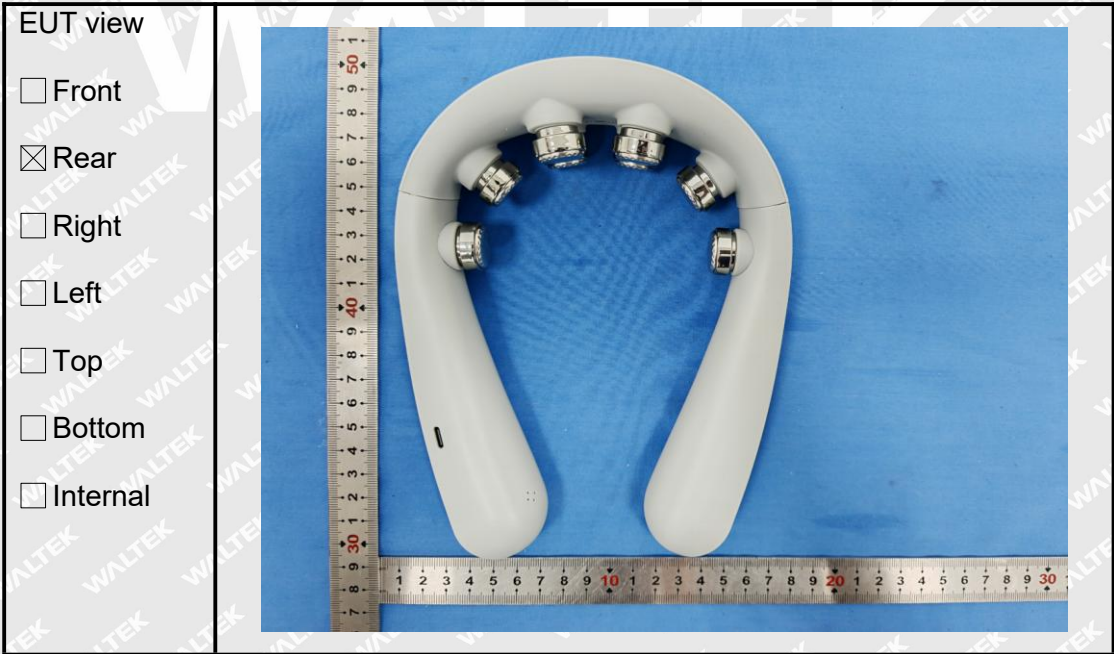
No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	WTHV1011A1-001	Power Meter	Agilent	E4417A	GB41290628	2025-01-02	2026-01-01
2	WTHV1013A1-001	RF Power Amplifier1(For 80-1000MHz)	RF light	NTWPA-008101000	22033072	2025-01-02	2026-01-01
3	WTHV1009B0-001	Stack double log periodic antennas	SCHWARZBECK	STLP 9128Es	3136	N/A	N/A
4	WTHV1051A1-001	power sensor	Agilent	E9323A	MR44420678	2025-01-02	2026-01-01
5	WTHV1031A1-001	power sensor	KEYSIGHT	E9323A	MR44420678	2025-01-02	2026-01-01
6	WTHE1034A1-001	analog signal source	KEYSIGHT	N5171B	56200371	2025-05-28	2026-05-27
Software List							
Description		Manufacturer			Model		Version
Test Software		Tonscend			JS35-RS		4.0.0.0
*Remark: indicates software version used in the compliance certification testing							

9.6.5 Performance Criterion Required & Test Result

Frequency Band (MHz)	Test Level	Test Points	Observation Performance	Criterion Required
80-1000	3V/m	Front Side	A	A
80-1000	3V/m	Rear Side	A	A
80-1000	3V/m	Left Side	A	A
80-1000	3V/m	Right Side	A	A



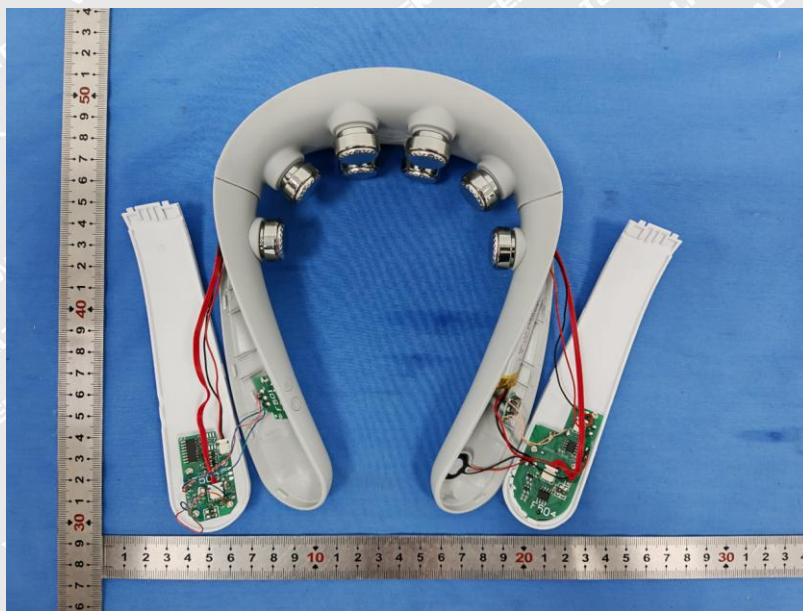
APPENDIX A - EUT PHOTOGRAPHS





EUT view

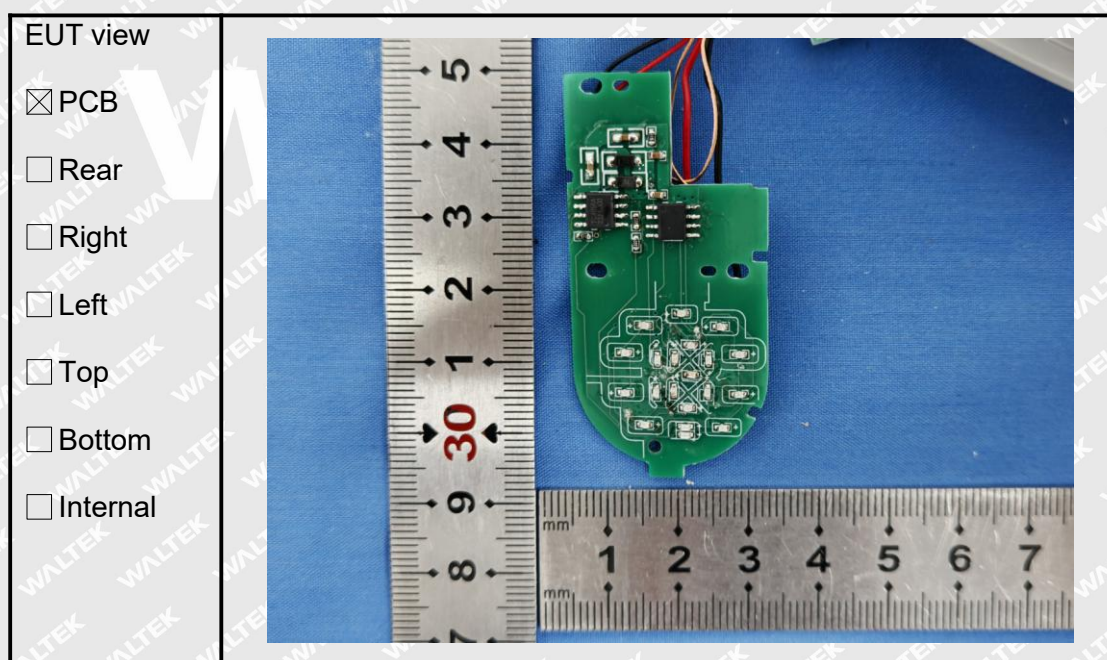
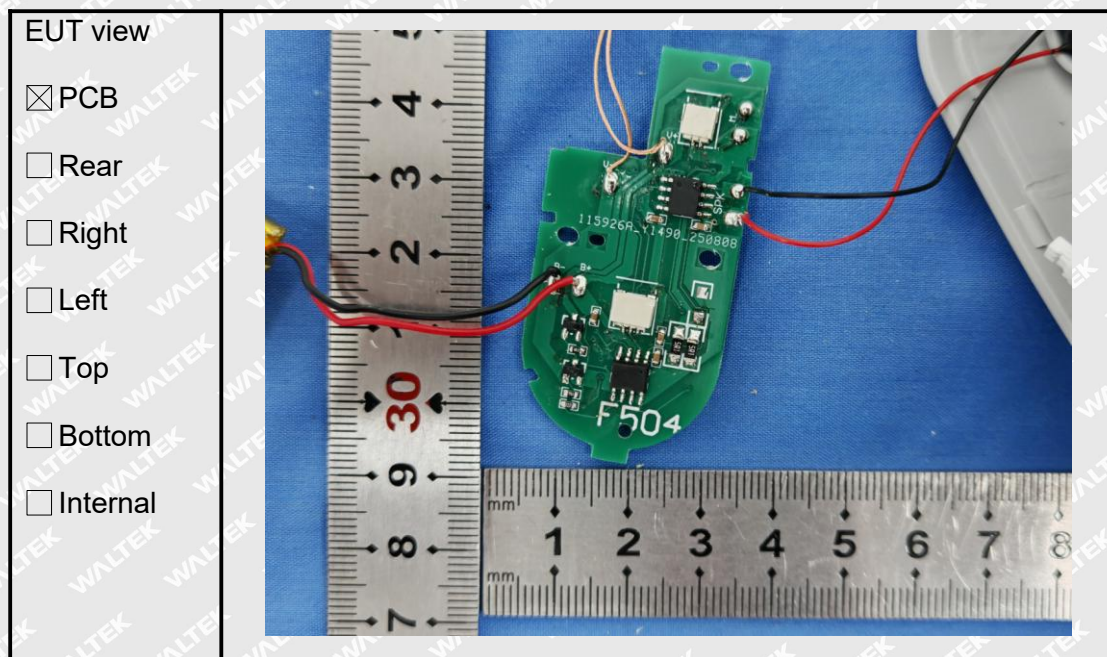
- ☒ Open
- ☐ Rear
- ☐ Right
- ☐ Left
- ☐ Top
- ☐ Bottom
- ☐ Internal

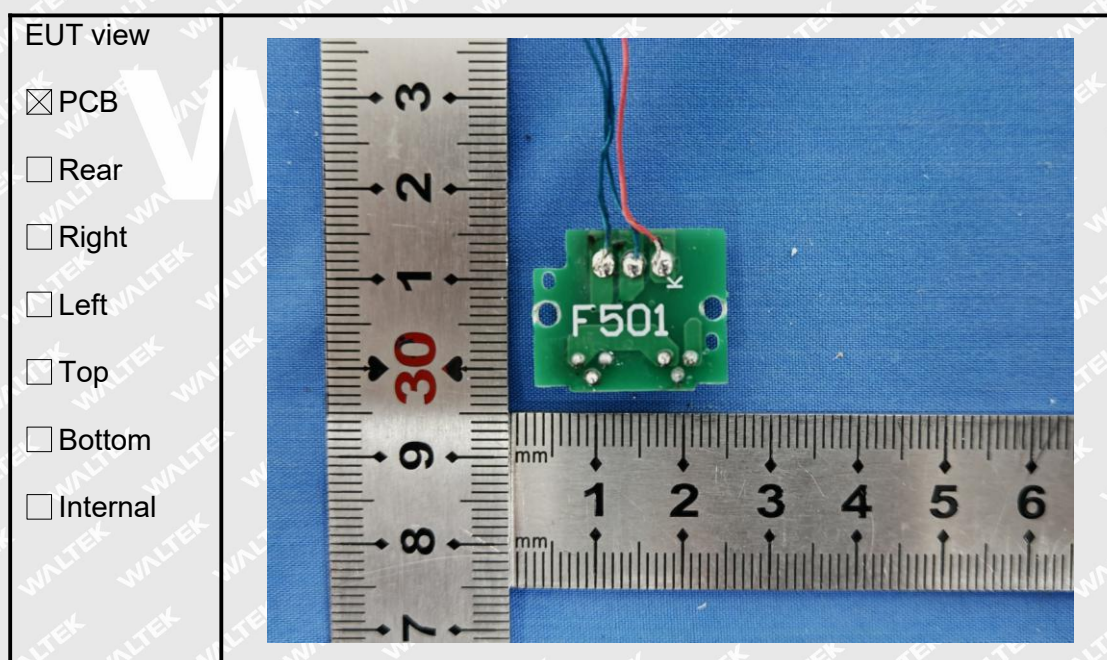
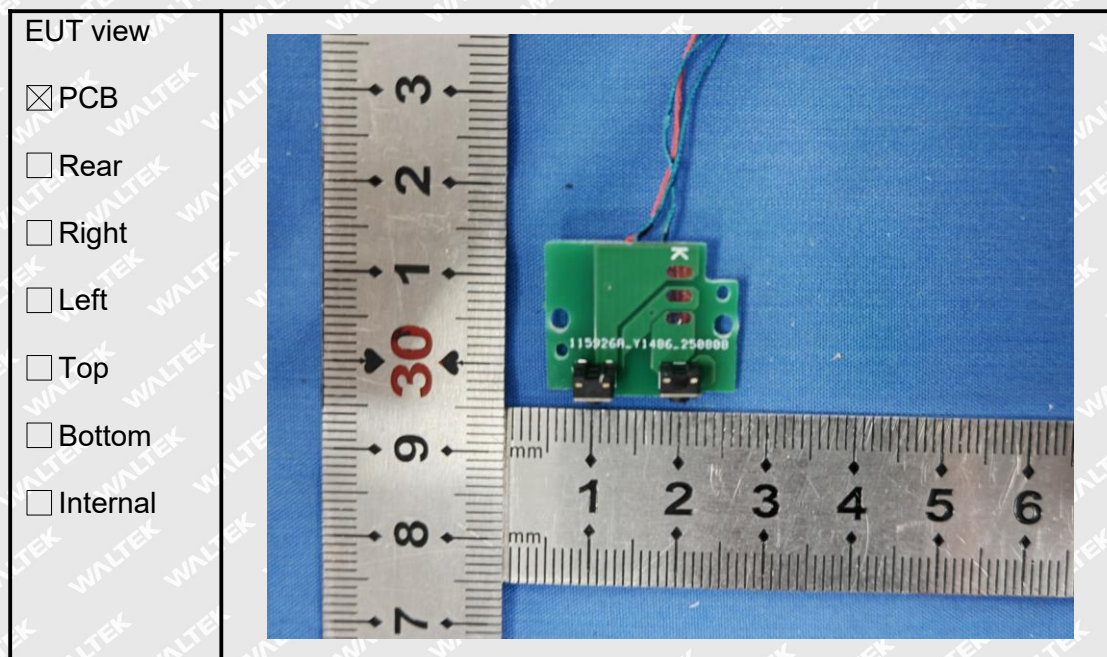


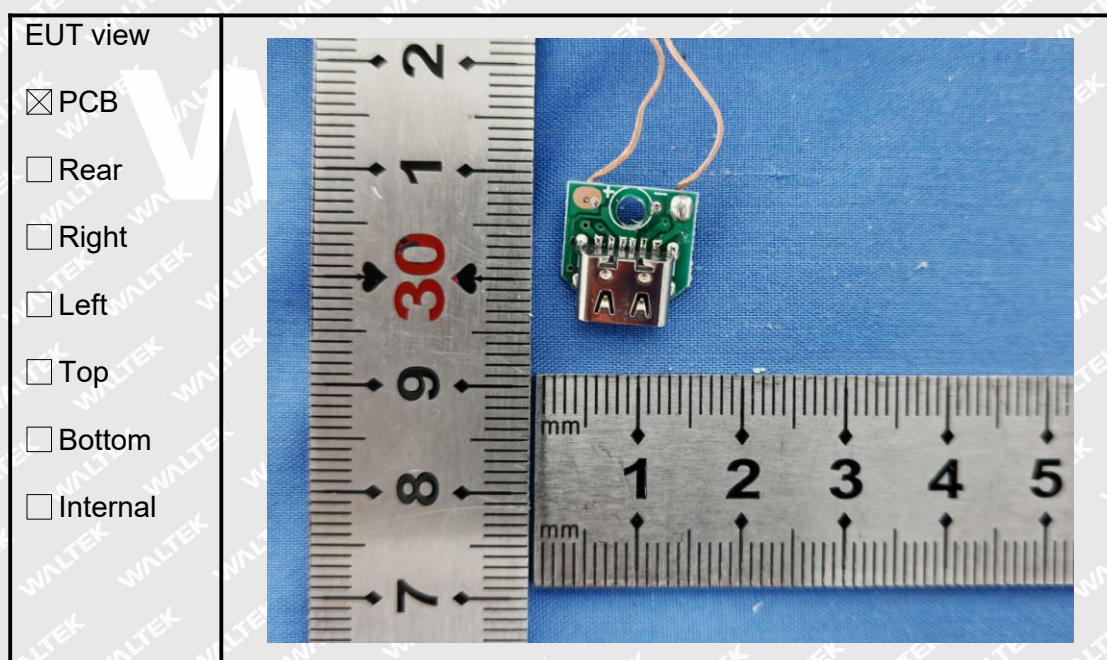
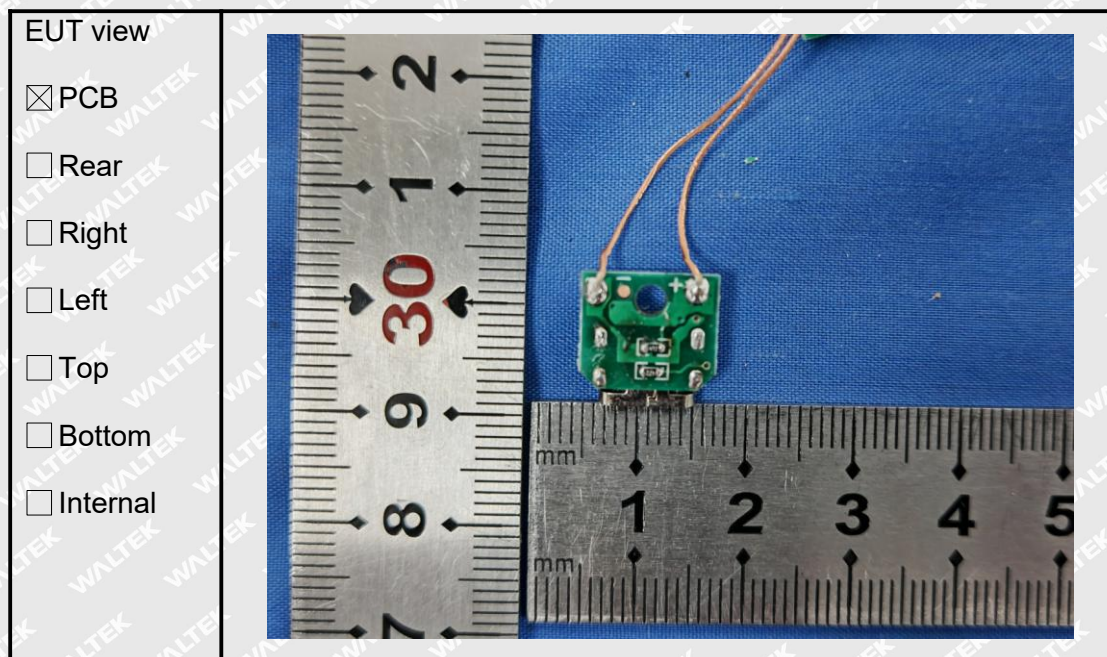
EUT view

- ☒ Port
- ☐ Rear
- ☐ Right
- ☐ Left
- ☐ Top
- ☐ Bottom
- ☐ Internal





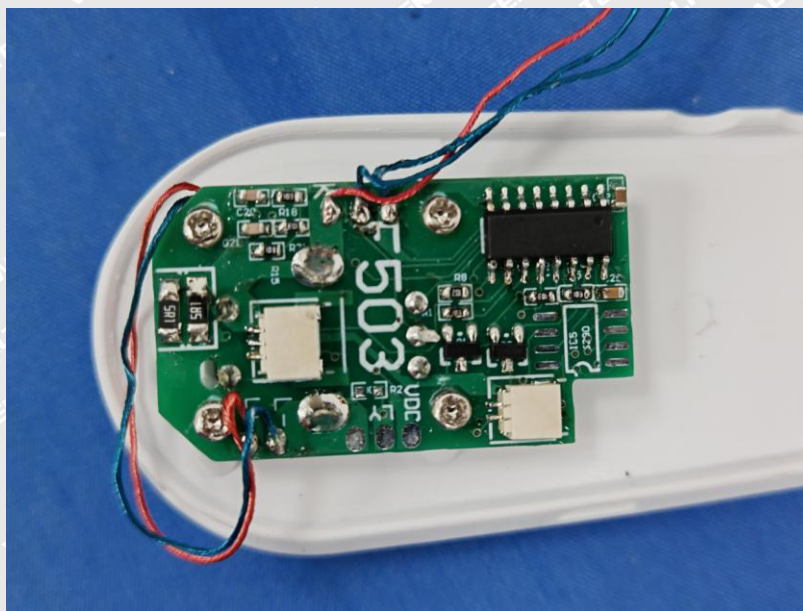






EUT view

- ☒ PCB
- ☐ Rear
- ☐ Right
- ☐ Left
- ☐ Top
- ☐ Bottom
- ☐ Internal



EUT view

- ☒ Battery
- ☐ Rear
- ☐ Right
- ☐ Left
- ☐ Top
- ☐ Bottom
- ☐ Internal



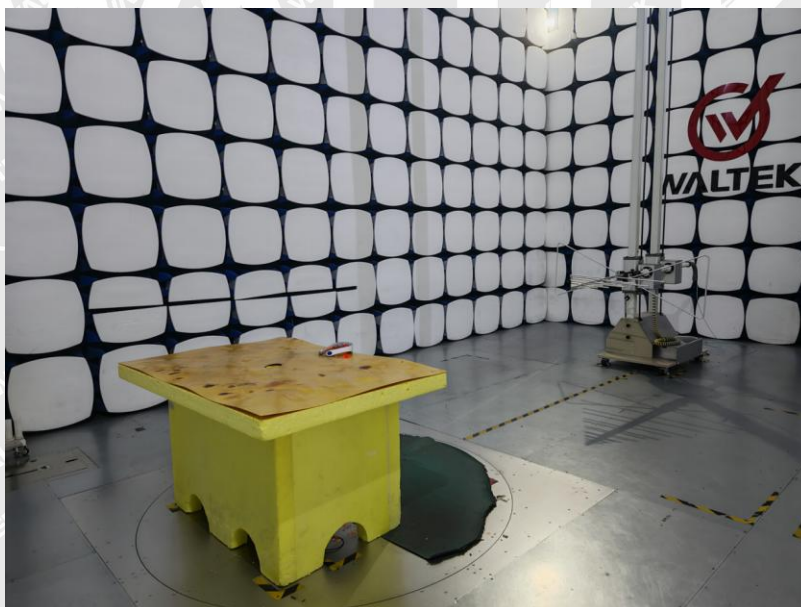


APPENDIX B - TEST SETUP PHOTOGRAPHS

Conducted Disturbance at The Mains Terminals



Radiated Disturbance of Below 1G





Electrostatic Discharge Immunity Test



Radiated Susceptibility Test



**(Statement):**

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- 2.The Applicant name and Address, the sample(s) and sample information was/were provided. by the applicant who should be responsible for the authenticity which HCT hasn't verified;
- 3.The result(s) shown in this report refer(s) only to the sample(s) tested;
- 4.The result(s) in no CMA logo report shall only be used for client's scientific research, teaching, internal quality control, product research and development, etc. and just for internal reference, does not prove to society..
- 5.The “*” in CNAS logo report means that the test item(s) was (were) currently not applying for CNAS accreditation.
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- 7.For any claim of the report, just refer to the testing unit in 15 days, in case it is not in the above limited time, the claim shall be dismissed.
- 8.Calibration:
All instruments used in the tests given in this test report are calibrated and traceable to national or international standards.
Further information about traceability will be given on request.

***** END OF REPORT *****

WALTEK