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CNAS L3163

CE&UKCA EMC Test Report

Project No. : 2302C097A
Equipment : Handheld Inkjet Printer
Brand Name : **BENTSAI**, 奔彩
Test Model : BT-HH6205 BL
Series Model : BT-HH6205 D(3), BT-HH6205 A(3), BT-HH6205 C(3), BT-HH6205 EL, BT-HH6210 BL, BT-HH6210 EL, BT-HH6210 A(3), BT-HH6210 C(3), BT-HH6210 D(3), BT-HH6205 FL, BT-HH6210 FL, BT-HH6205 GL, BT-HH6210 GL, BT-HH6205 KL, BT-HH6210 KL, BT-HH6205 ZL, BT-HH6210 ZL, BT-HH6205 VL, BT-HH6210 VL, BT-HH6205 PL, BT-HH6210 PL, BT-HH6205 LL, BT-HH6210 LL
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Date of Receipt : May 12, 2023
Date of Test : May 15, 2023 ~ May 26, 2023
Issued Date : Jul. 03, 2023
Report Version : R00
Test Sample : Engineering Sample No.: DG2023051229
Standard(s) : Please refer to Page 2.

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

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Standard(s) : EN 55032:2015+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021
EN 55035:2017+A11:2020

BS EN 55032:2015+A11:2020
BS EN IEC 61000-3-2:2019+A1:2021
BS EN 61000-3-3:2013+A2:2021
BS EN 55035:2017+A11:2020

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any other agency.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-EMC-1-2302C097A	R00	This is a supplementary report to the original test report (BTL-EMC-1-2302C097). Changed the PCB, so all test items used worst case to test and recorded in the test report. In this report only recorded the new test results. The original test results please refer to original report.	Jul. 03, 2023	Valid

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission			
Standard(s)	Test Item		Result
EN 55032:2015+A11:2020 BS EN 55032:2015+A11:2020	Radiated emissions up to 1 GHz		PASS
	Radiated emissions above 1 GHz		PASS
	Radiated emissions from FM receivers		N/A
	Conducted emissions AC mains power port		PASS
	Asymmetric mode conducted emissions	AAN	N/A
		Current Probe	N/A
		CP+CVP	N/A
	Conducted differential voltage emissions		N/A

Standard(s)	Test Item	Result
EN IEC 61000-3-2:2019+A1:2021 BS EN IEC 61000-3-2:2019+A1:2021	Harmonic current	PASS
EN 61000-3-3:2013+A2:2021 BS EN 61000-3-3:2013+A2:2021	Voltage fluctuations (Flicker)	PASS

Immunity			
Standard(s)	Ref Standard(s)	Test Item	Result
EN 55035:2017+A11:2020 BS EN 55035:2017+A11:2020	IEC 61000-4-2:2008	ESD	PASS
	IEC 61000-4-3:2020	RS	PASS
	IEC 61000-4-4:2012	EFT	PASS
	IEC 61000-4-5:2014+AMD1:2017	Surge	PASS
	IEC 61000-4-6:2013	CS	PASS
	IEC 61000-4-8:2009	PFMF	PASS
	IEC 61000-4-11:2020	Dips	PASS

Standard(s)	Section	Test Item	Result
EN 55035:2017+A11:2020 BS EN 55035:2017+A11:2020	4.2.7	BIN-R	N/A
	4.2.7	BIN-I	N/A

NOTE:

(1) "N/A" denotes test is not applicable to this device.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2, The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95%**.

A. Radiated emissions up to 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB08 (10m)	CISPR	30MHz ~ 200MHz	V	4.72
		30MHz ~ 200MHz	H	4.40
		200MHz ~ 1,000MHz	V	4.58
		200MHz ~ 1,000MHz	H	3.70

B. Radiated emissions above 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB08 (3m)	CISPR	1GHz ~ 6GHz	3.94

C. Conducted emissions AC mains power port measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-C01	CISPR	150kHz ~ 30MHz	2.86

D. Harmonic current / Voltage fluctuations (Flicker) measurement:

Test Site	Method	Item	U (%)
DG-C01	EN IEC 61000-3-2	Current	0.593
	EN 61000-3-3	Voltage	0.595

E. Immunity Measurement:

Test Site	Method	Item	U
DG-SR02	IEC 61000-4-2	Rise time tr	6.30%
		Peak current Ip	6.70%
		Current at 30 ns	6.40%
		Current at 60 ns	6.90%
DG-CB05	IEC 61000-4-3 (80MHz~6GHz)	Electromagnetic field immunity test	2.00dB
DG-SR05	IEC 61000-4-4	Peak voltage (VP)	3.8%
		Rise time (tr)	4.4%
		Pulse width(tw)	4.2%
		Pulse Freq.(kHz)	0.7%
		Burst Duration(ms)	1.5%
		Burst Period(ms)	1.4%
DG-SR05	IEC 61000-4-5	Open-Circuit Output Voltage (1.2/50us)	4.0%
		Open circuit front time (1.2/50us)	6.2%
		Open circuit time of half value (1.2/50us)	4.8%
DG-CB06	IEC 61000-4-6 (150kHz-80MHz)	CDN	1.32dB
DG-SR05	IEC 61000-4-8	Magnetic Field Strength	2.38%
DG-SR01	IEC 61000-4-11	DIP Amplitude	3.6%
		DIP Time Event	4.0%

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.


1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Tested By
Radiated emissions up to 1 GHz	30°C	55%	Karpin Zhong
Radiated emissions above 1 GHz	26°C	53%	Karpin Zhong
Conducted emissions AC mains power port	25°C	45%	Jeter Wang
Harmonic current	23°C	64%	Promise Yin
Voltage fluctuations (Flicker)	23°C	64%	Promise Yin

Test Item	Temperature	Humidity	Pressure	Tested By
ESD	25°C	46%	1010hPa	Chien Li
RS	23°C	54%	/	Luther Lai
EFT	24°C	40%	/	Meers Zhang
Surge	24°C	40%	/	Meers Zhang
CS	25°C	49%	/	Luther Lai
PFMF	24°C	40%	/	Meers Zhang
Dips	27°C	59%	/	Luther Lai

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Handheld Inkjet Printer
Brand Name	BENTSAI , 奔彩
Test Model	BT-HH6205 BL
Series Model	BT-HH6205 D(3), BT-HH6205 A(3), BT-HH6205 C(3), BT-HH6205 EL, BT-HH6210 BL, BT-HH6210 EL, BT-HH6210 A(3), BT-HH6210 C(3), BT-HH6210 D(3), BT-HH6205 FL, BT-HH6210 FL, BT-HH6205 GL, BT-HH6210 GL, BT-HH6205 KL, BT-HH6210 KL, BT-HH6205 ZL, BT-HH6210 ZL, BT-HH6205 VL, BT-HH6210 VL, BT-HH6205 PL, BT-HH6210 PL, BT-HH6205 LL, BT-HH6210 LL
Model Difference(s)	The upper cover of product appearance, the front roller seat of the product and model name are different.
Power Source	1# DC voltage supplied from AC adapter. Model: JQS0242A-E090200 2# Supplied from battery.
Power Rating	1# I/P: 100-240V~50/60Hz 0.7A O/P: 9.0V  2.0A 2# DC 3.7V
Connecting I/O Port(s)	1* DC port 1* USB port 1* Optical port
Classification of EUT	Class A
Highest Internal Frequency(Fx)	192MHz

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging

Radiated emissions up to 1 GHz Test	
Final Test Mode	Description
Mode 1	Charging

Radiated emissions Above 1 GHz Test	
Final Test Mode	Description
Mode 1	Charging

Conducted emissions AC mains power port Test	
Final Test Mode	Description
Mode 1	Charging

Harmonic current & Voltage fluctuations (Flicker) Test	
Final Test Mode	Description
Mode 1	Charging

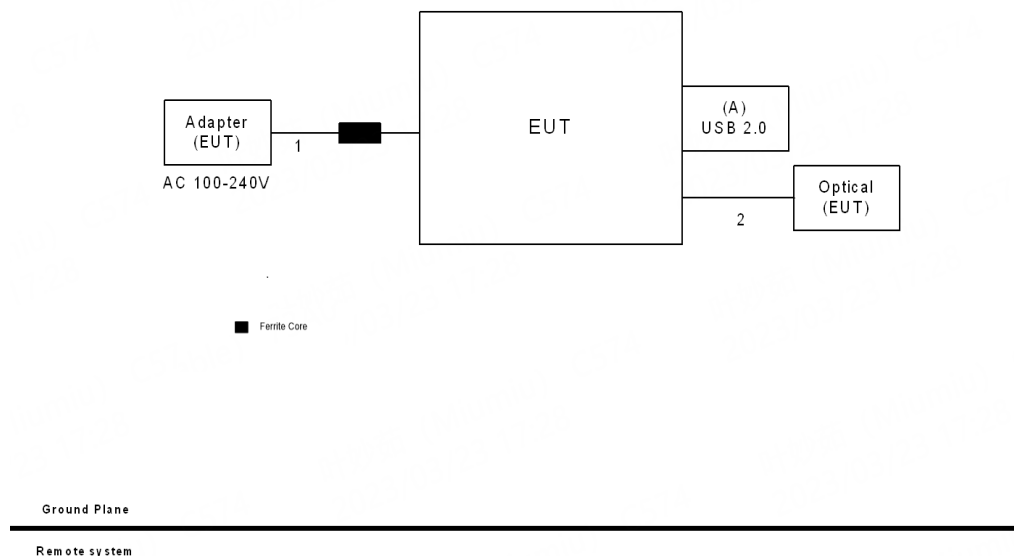
Immunity Test	
Final Test Mode	Description
Mode 1	Charging

2.3 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The standard test signals and output signal as following:

1. EUT connected to Adapter via DC Cable.
2. EUT connected to Optical via Optical Cable.
3. The USB 2.0 is plugged into EUT.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	USB 2.0	WD	WDBAAR3200ABK	WXG1EB0AZC81

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	YES	1m
2	Optical Cable	NO	NO	1m

3. EMC EMISSION TEST

3.1 RADIATED EMISSIONS UP TO 1 GHz

3.1.1 LIMITS

Class A equipment up to 1 GHz

Frequency Range MHz	Measurement			Class A limits dB(μV/m)
	Facility	Distance m	Detector type/ bandwidth	
30 - 230	SAC	10	Quasi peak / 120 kHz	40
230 - 1000				47

Notes:

- (1) The limit for radiated test was performed according to as following: EN 55032
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Receiver	Keysight	N9038A	MY54450004	Jul. 03, 2023
2	MXE EMI Receiver	KEYSIGHT	N9038B	MY62210123	Nov. 28, 2023
3	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980284	Jul. 03, 2023
4	Pre-Amplifier	EMC INSTRUMENT	EMC 9135	980283	Jul. 03, 2023
5	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	947	Nov. 02, 2023
6	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	946	Sep. 30, 2023
7	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
8	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
9	Controller	MF	MF-7802	MF780208159	N/A
10	Attenuator	EMCI	EMCI-N-6-06	AT-N0671	Sep. 30, 2023
11	Attenuator	EMCI	EMCI-N-6-06	AT-N0670	Nov. 02, 2023
12	Cable	RW	LMR400-NMNM-10M	N/A	Dec. 06, 2023
13	Cable	RW	LMR400-NMNM-7M	N/A	Dec. 06, 2023
14	Cable	RW	LMR400-NMNM-3.5M	N/A	Dec. 06, 2023
15	Cable	RW	LMR400-NMNM-8M	N/A	Dec. 06, 2023
16	Cable	RW	LMR400-NMNM-7M	N/A	Dec. 06, 2023
17	Cable	RW	LMR400-NMNM-3.5M	N/A	Dec. 06, 2023

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.

All calibration period of equipment list is one year.

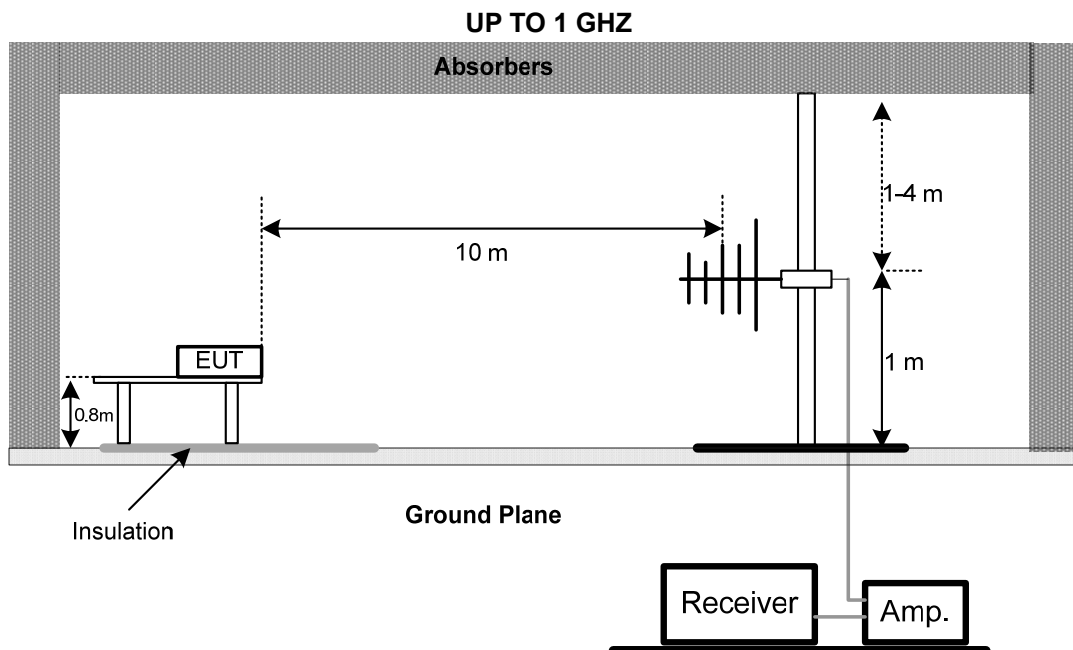
3.1.3 TEST PROCEDURE

- The measuring distance of 10 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- For the actual test configuration, please refer to the related Item - EUT Test Photos.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 MEASUREMENT DISTANCE

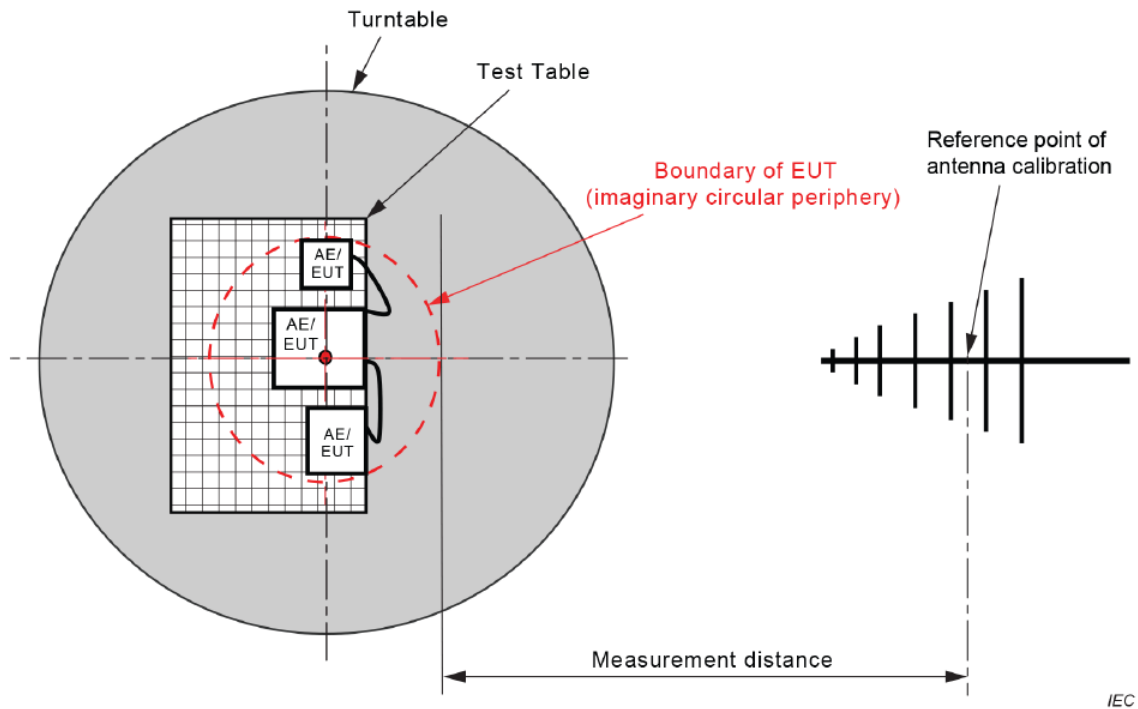


Figure C.1 – Measurement distance

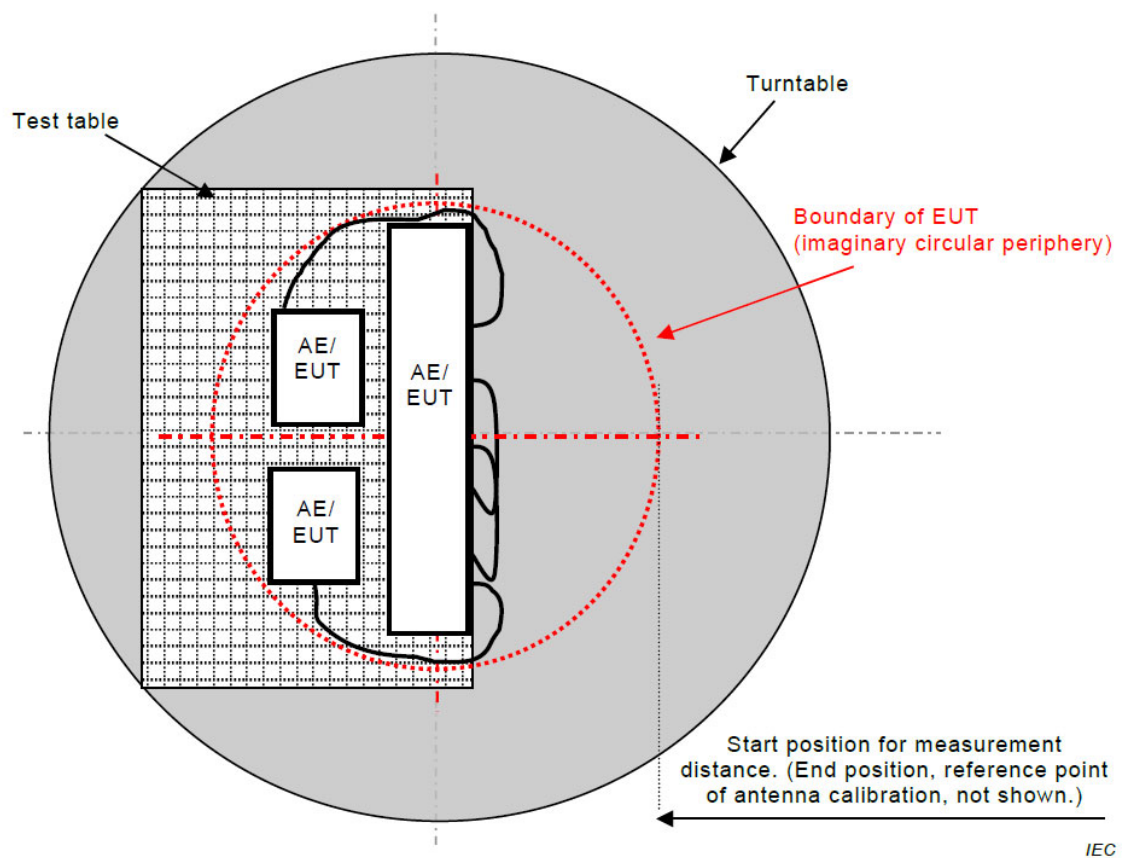
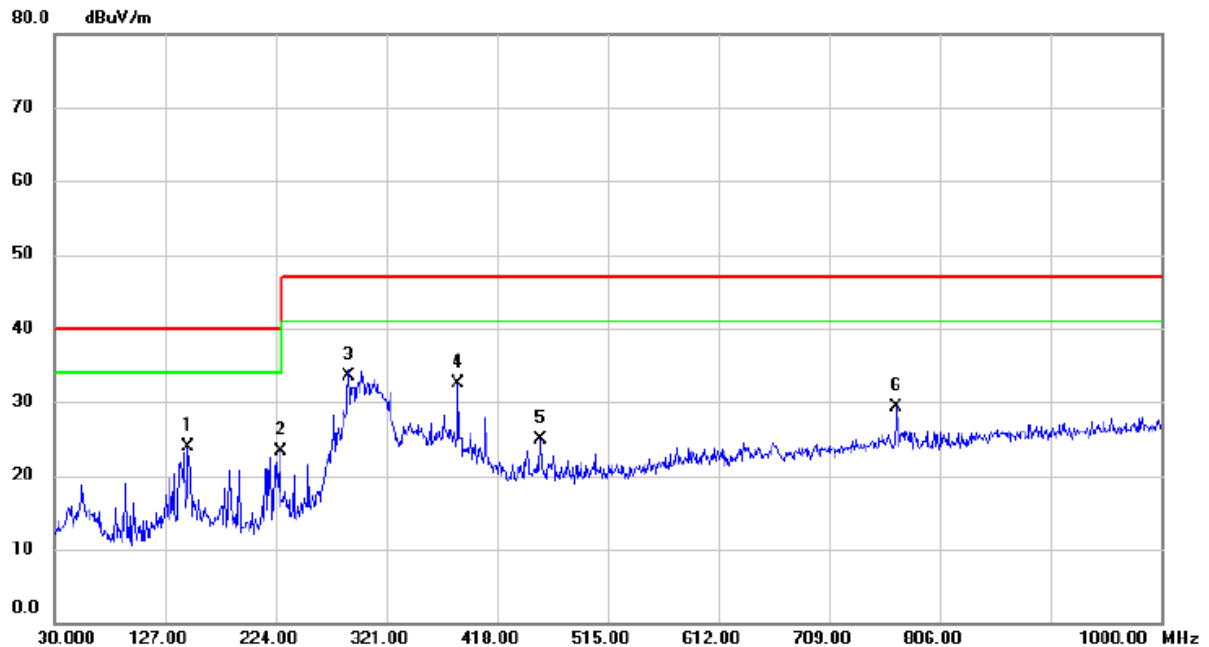


Figure C.2 – Boundary of EUT, Local AE and associated cabling

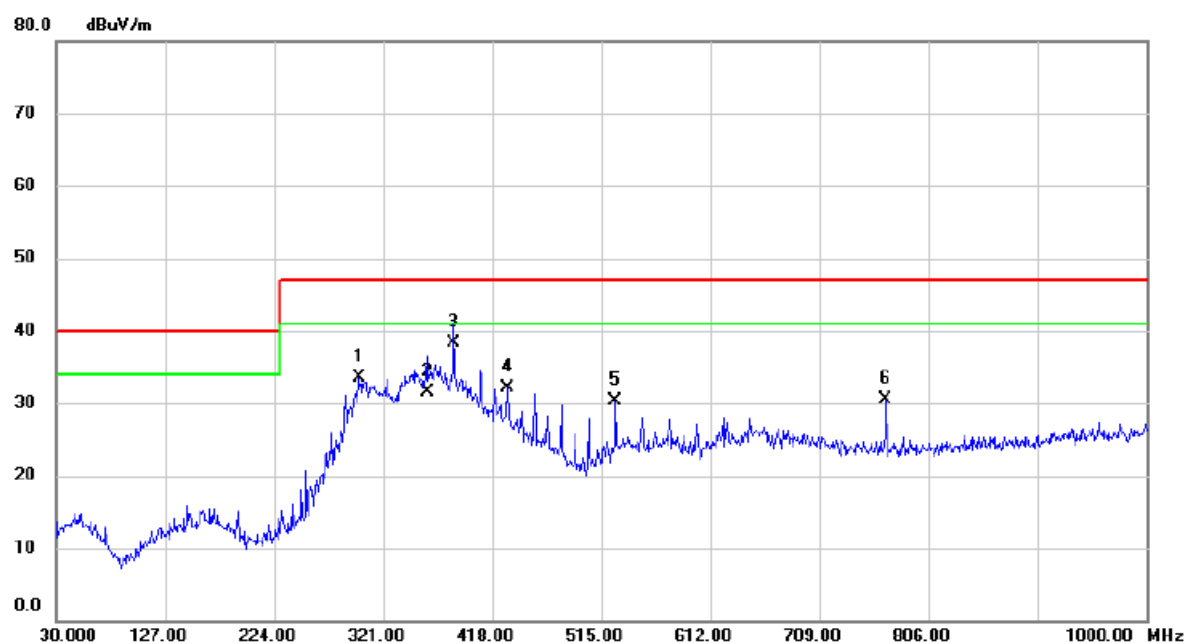
3.1.7 TEST RESULTS

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Mode 1		



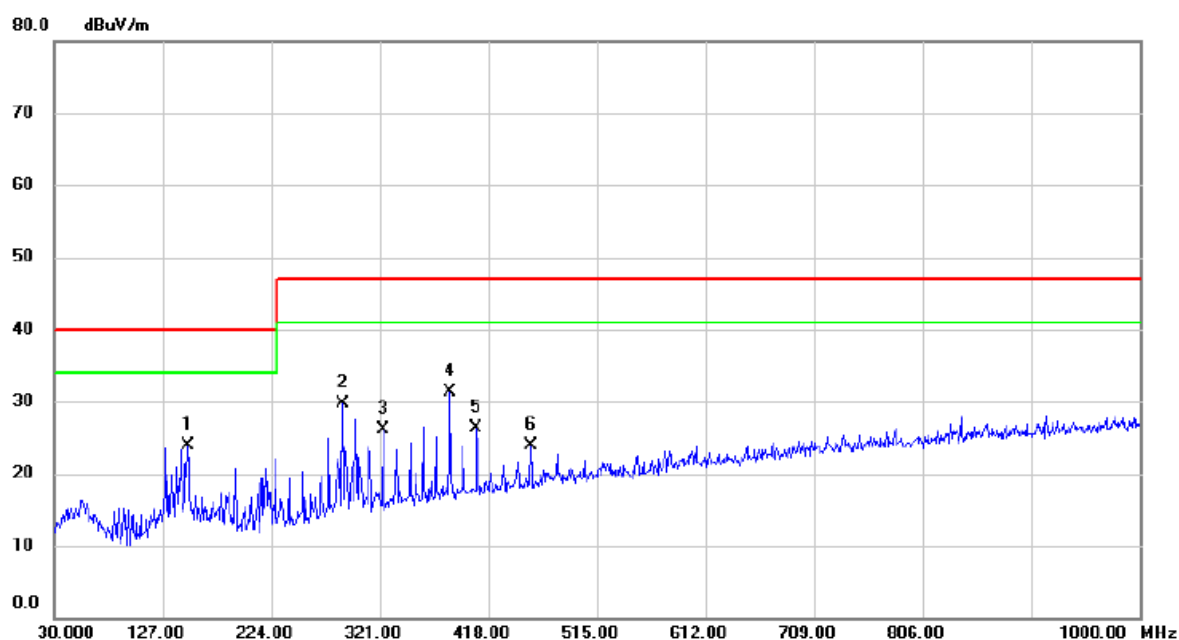
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		147.3700	41.41	-17.43	23.98	40.00	-16.02	QP	
2		227.8800	42.29	-18.97	23.32	40.00	-16.68	QP	
3	*	288.0200	49.61	-16.03	33.58	47.00	-13.42	QP	
4		384.0500	46.04	-13.59	32.45	47.00	-14.55	QP	
5		455.8300	36.89	-11.92	24.97	47.00	-22.03	QP	
6		768.1700	37.06	-7.76	29.30	47.00	-17.70	QP	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Mode 1		



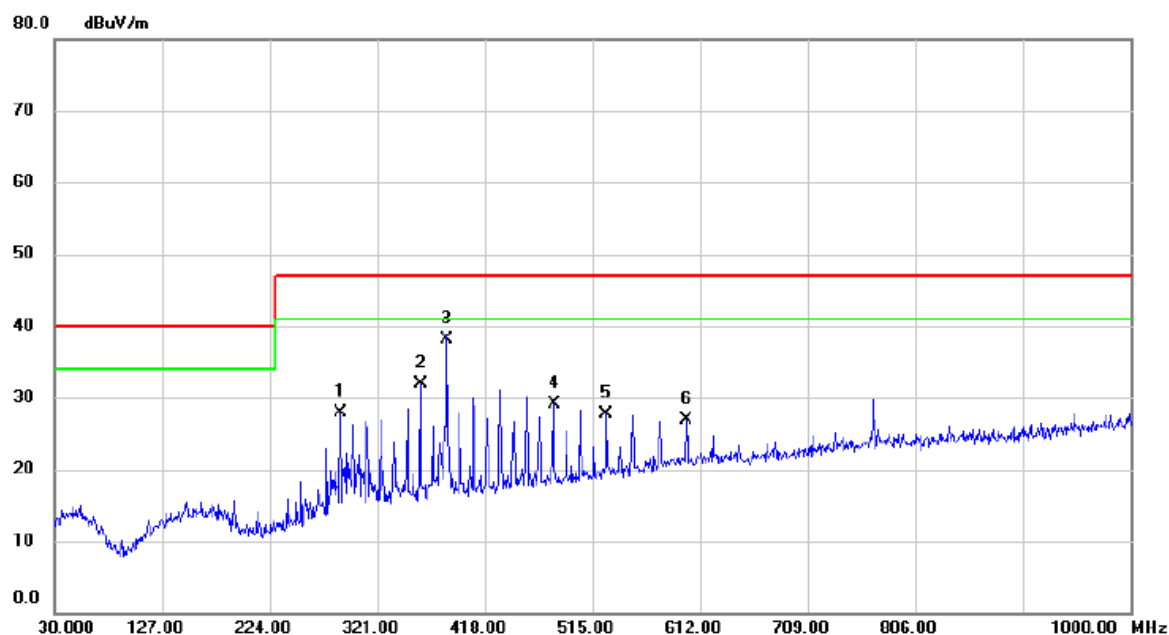
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		299.6600	49.44	-15.94	33.50	47.00	-13.50	QP	
2		359.8000	45.78	-14.24	31.54	47.00	-15.46	QP	
3	*	384.0500	52.06	-13.67	38.39	47.00	-8.61	QP	
4		431.5800	44.57	-12.43	32.14	47.00	-14.86	QP	
5		527.6100	41.08	-10.80	30.28	47.00	-16.72	QP	
6		768.1700	38.20	-7.74	30.46	47.00	-16.54	QP	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		149.3100	41.19	-17.36	23.83	40.00	-16.17	QP	
2		288.0200	45.76	-16.03	29.73	47.00	-17.27	QP	
3		323.9100	41.19	-15.01	26.18	47.00	-20.82	QP	
4	*	384.0500	44.95	-13.59	31.36	47.00	-15.64	QP	
5		407.3300	39.26	-13.04	26.22	47.00	-20.78	QP	
6		455.8300	35.79	-11.92	23.87	47.00	-23.13	QP	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		288.0200	44.26	-16.26	28.00	47.00	-19.00	QP	
2		359.8000	46.12	-14.24	31.88	47.00	-15.12	QP	
3	*	384.0500	51.71	-13.67	38.04	47.00	-8.96	QP	
4		480.0800	40.73	-11.53	29.20	47.00	-17.80	QP	
5		527.6100	38.49	-10.80	27.69	47.00	-19.31	QP	
6		599.3900	36.18	-9.28	26.90	47.00	-20.10	QP	

3.2 RADIATED EMISSIONS ABOVE 1 GHz

3.2.1 LIMITS

Class A equipment above 1 GHz

Frequency Range MHz	Measurement			Class A limits dB(μV/m)
	Facility	Distance m	Detector type/bandwidth	
1000 - 3000	FSOATS	3	Average / 1 MHz	56
3000 - 6000				60
1000 - 3000			Peak / 1 MHz	76
3000 - 6000				80

Notes:

- (1) The limit for radiated test was performed according to as following: EN 55032
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
 Margin Level = Measurement Value - Limit Value

Required highest frequency for radiated measurement

Highest internal frequency (F _x)	Highest measured frequency
F _x ≤ 108 MHz	1 GHz
108 < F _x ≤ 500 MHz	2 GHz
500 < F _x ≤ 1000 MHz	5 GHz
F _x > 1 GHz	5 x F _x up to a maximum of 6 GHz

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Horn Antenna	EMCO	3115 (3m)	9605-4803	Jun. 16, 2023
2	Amplifier	Agilent	8449B	3008A02333	Jan. 08, 2024
3	Cable	Micable	RWLP50-4.0A-S MSM-12M-KJ	20191107 002	Mar. 02, 2024
4	MXE EMI Receiver	KEYSIGHT	N9038B	MY62210123	Nov. 28, 2023
5	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
6	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
7	Controller	MF	MF-7802	MF780208159	N/A

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.

All calibration period of equipment list is one year.

3.2.3 TEST PROCEDURE

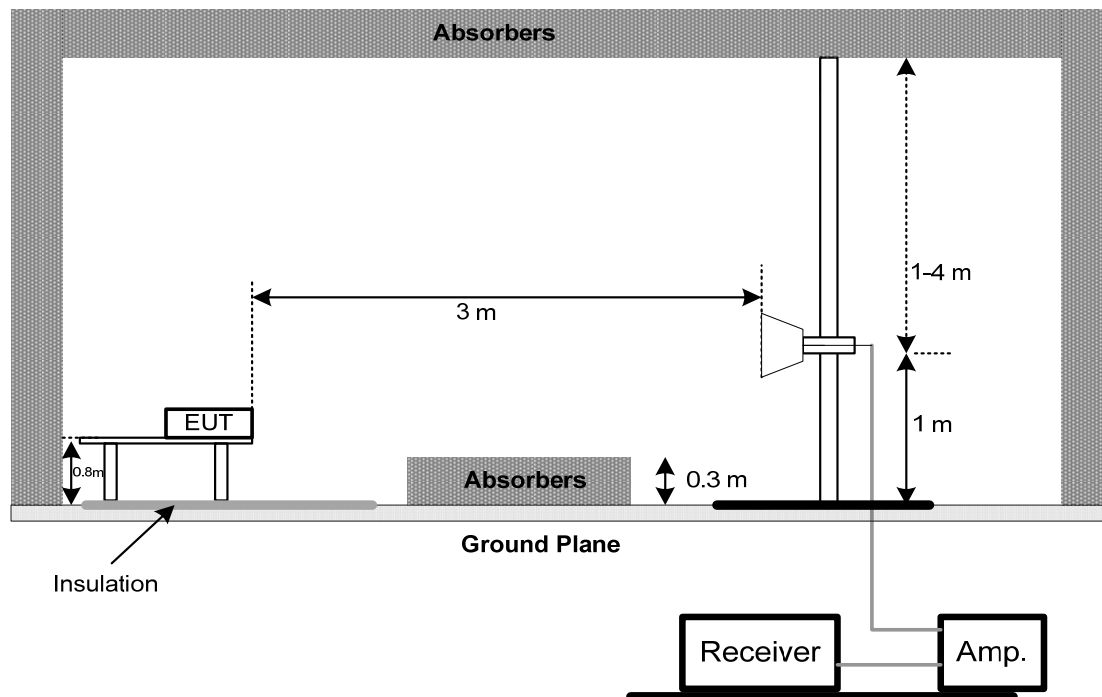
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then AVG detector mode re-measured.
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.
- For the actual test configuration, please refer to the related Item - EUT Test Photos.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP

ABOVE 1 GHZ



3.2.6 MEASUREMENT DISTANCE

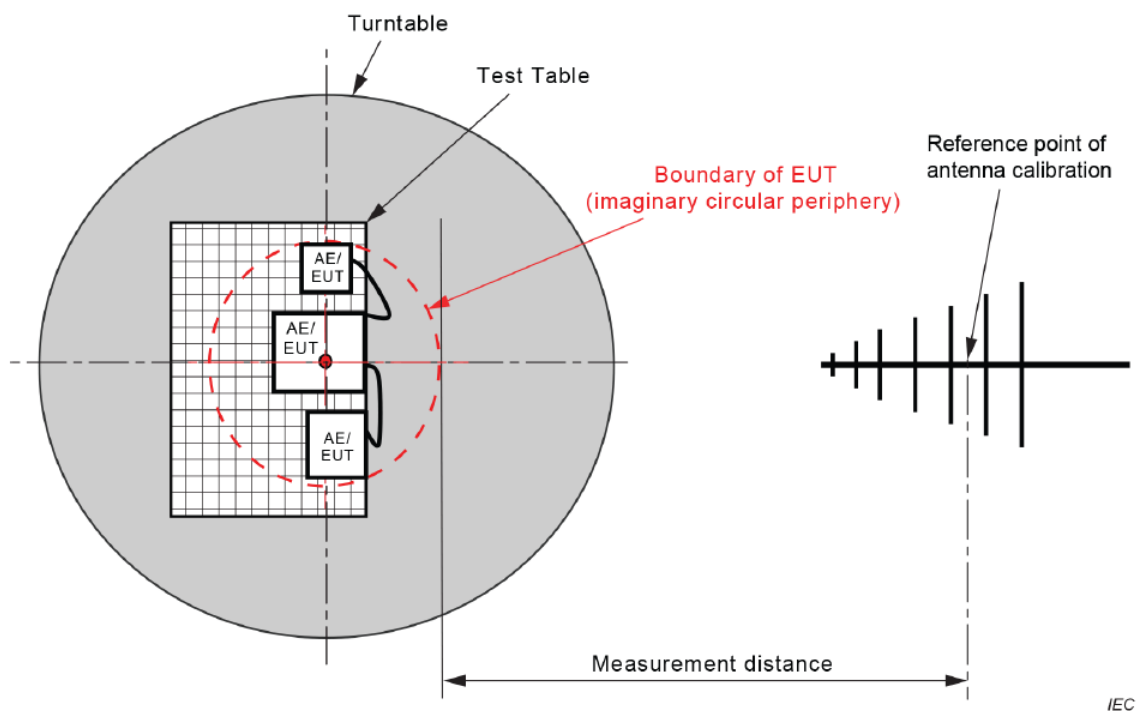


Figure C.1 – Measurement distance

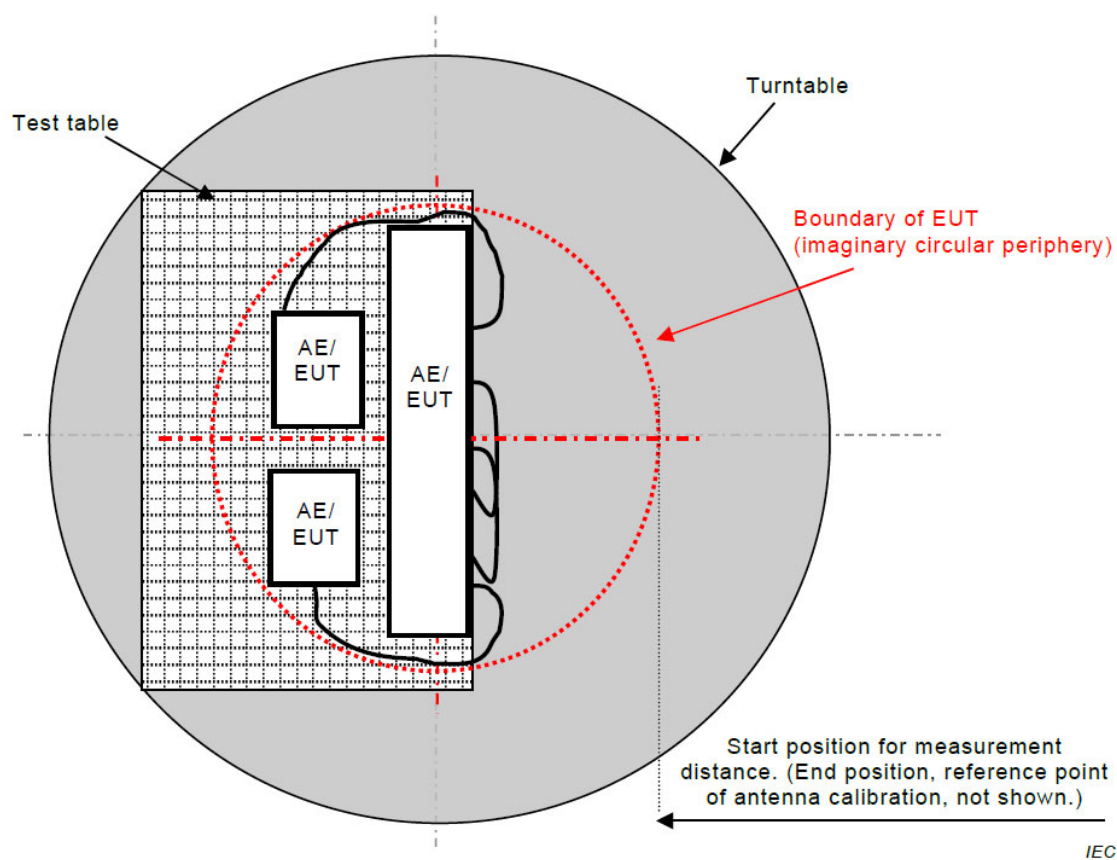
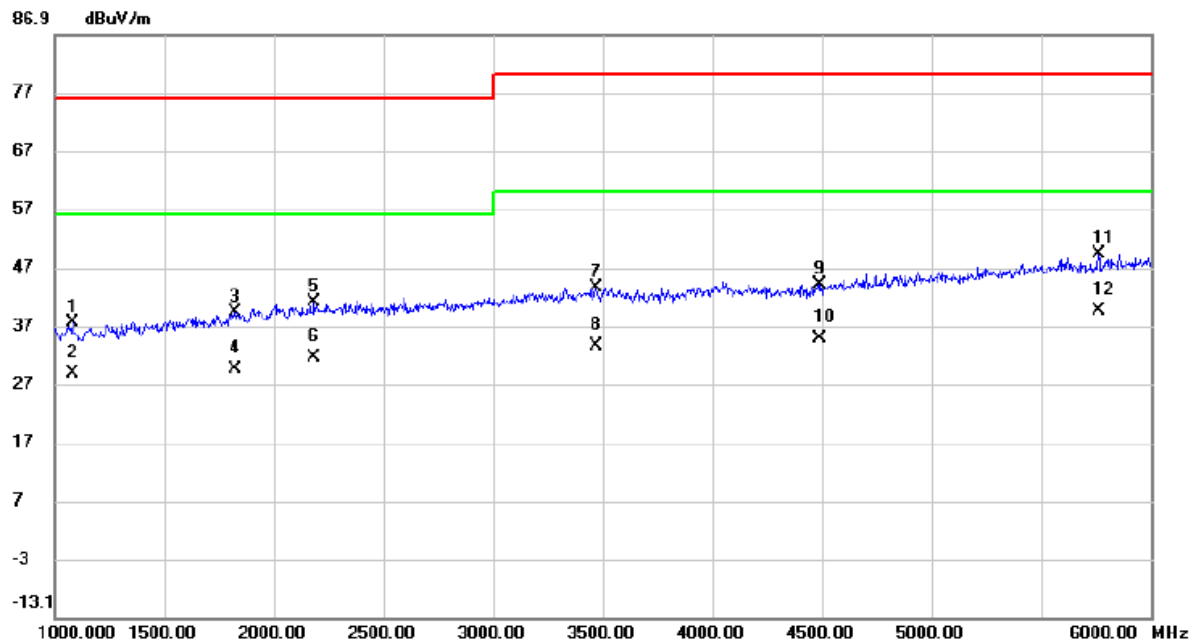


Figure C.2 – Boundary of EUT, Local AE and associated cabling

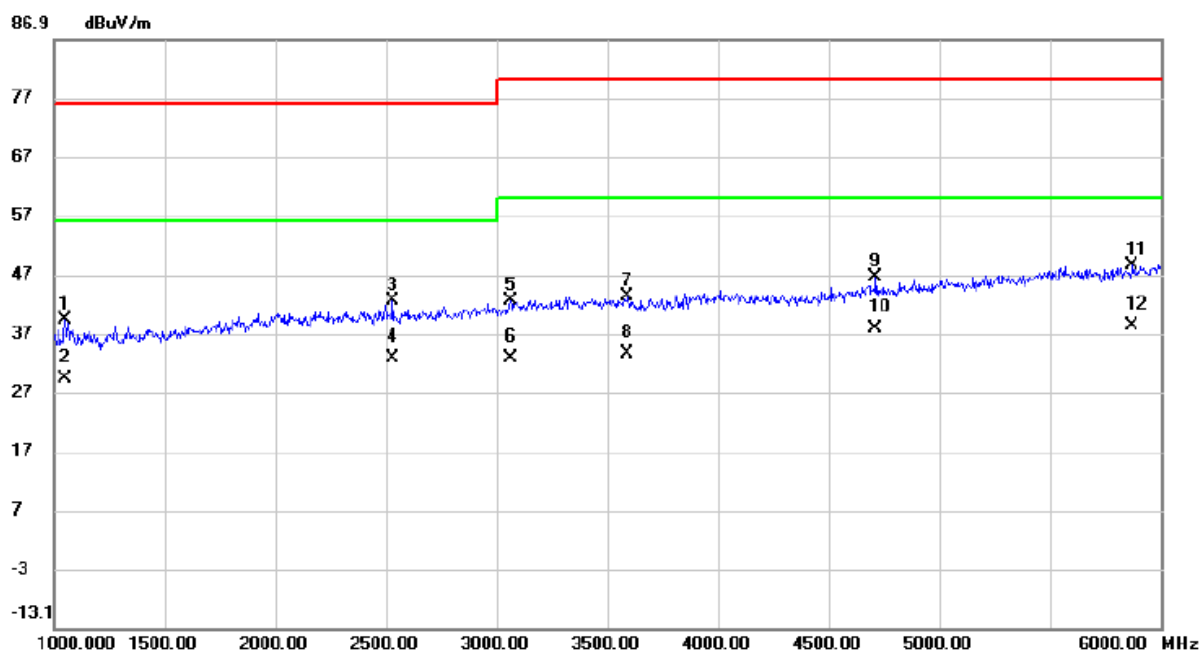
3.2.7 TEST RESULTS

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Mode 1		



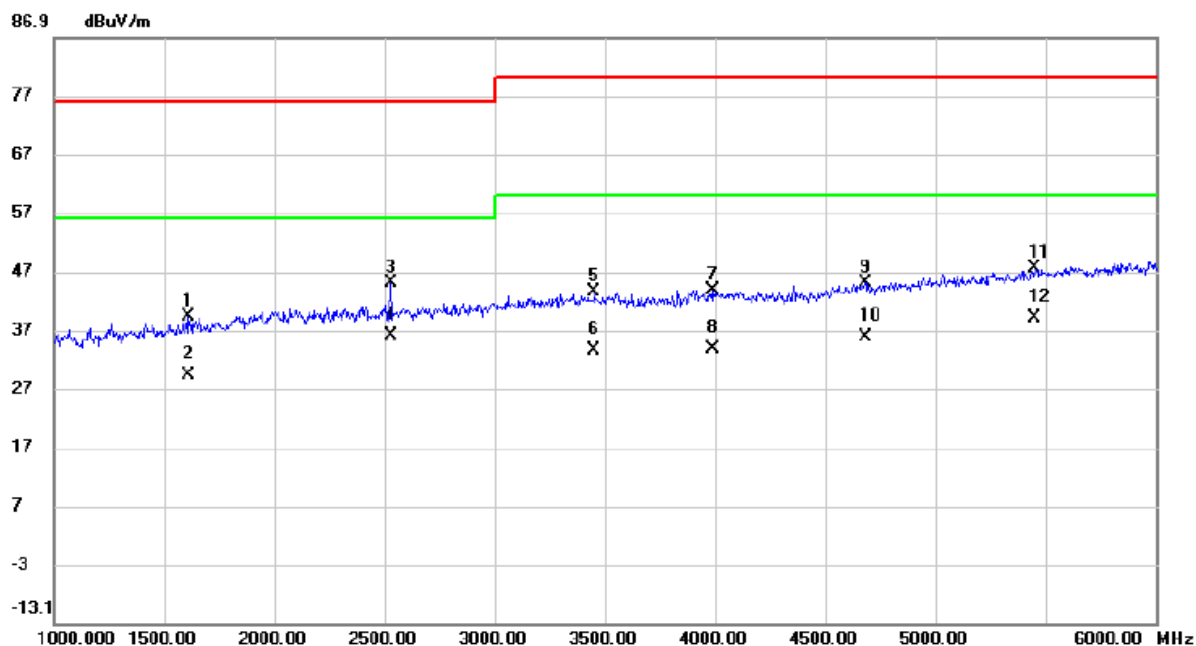
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1080.000	41.59	-4.01	37.58	76.00	-38.42	peak	
2		1080.000	32.67	-4.01	28.66	56.00	-27.34	AVG	
3		1822.500	37.93	1.43	39.36	76.00	-36.64	peak	
4		1822.500	28.15	1.43	29.58	56.00	-26.42	AVG	
5		2185.000	37.80	3.26	41.06	76.00	-34.94	peak	
6		2185.000	28.26	3.26	31.52	56.00	-24.48	AVG	
7		3470.000	35.41	8.20	43.61	80.00	-36.39	peak	
8		3470.000	25.37	8.20	33.57	60.00	-26.43	AVG	
9		4490.000	33.39	10.69	44.08	80.00	-35.92	peak	
10		4490.000	24.08	10.69	34.77	60.00	-25.23	AVG	
11		5760.000	33.45	15.76	49.21	80.00	-30.79	peak	
12	*	5760.000	23.85	15.76	39.61	60.00	-20.39	AVG	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Mode 1		



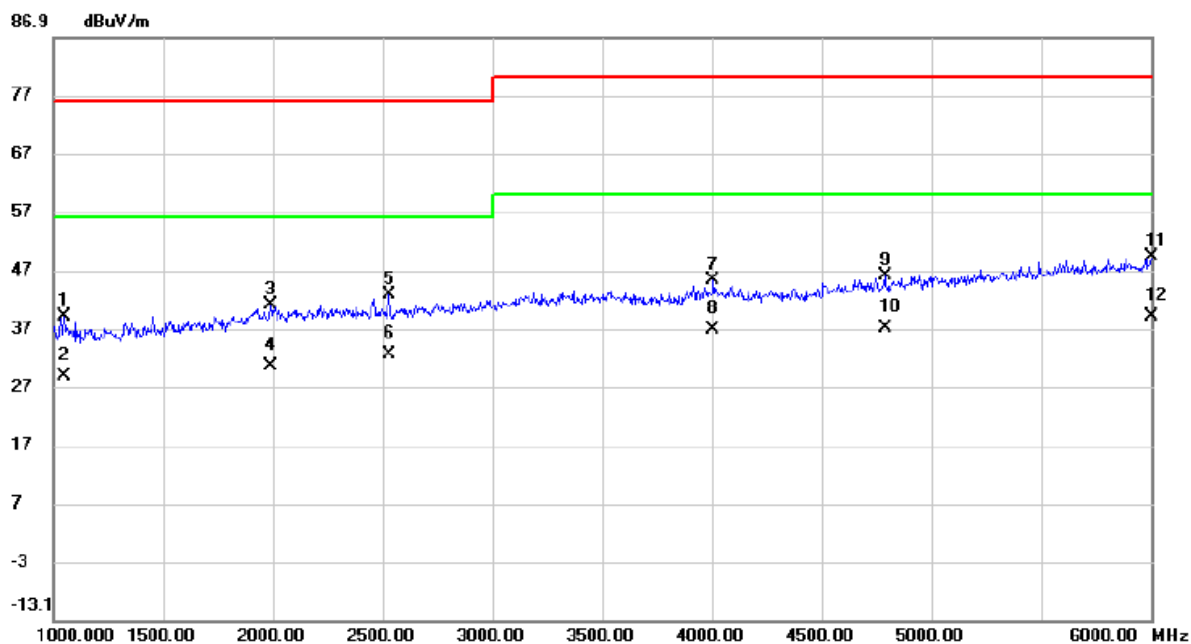
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1050.000	43.60	-4.21	39.39	76.00	-36.61	peak	
2		1050.000	33.44	-4.21	29.23	56.00	-26.77	AVG	
3		2530.000	38.49	4.07	42.56	76.00	-33.44	peak	
4		2530.000	28.64	4.07	32.71	56.00	-23.29	AVG	
5		3060.000	36.33	6.09	42.42	80.00	-37.58	peak	
6		3060.000	26.72	6.09	32.81	60.00	-27.19	AVG	
7		3592.500	34.81	8.54	43.35	80.00	-36.65	peak	
8		3592.500	25.02	8.54	33.56	60.00	-26.44	AVG	
9		4712.500	34.86	11.63	46.49	80.00	-33.51	peak	
10		4712.500	26.26	11.63	37.89	60.00	-22.11	AVG	
11		5870.000	32.29	16.16	48.45	80.00	-31.55	peak	
12	*	5870.000	22.10	16.16	38.26	60.00	-21.74	AVG	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1607.500	39.65	-0.31	39.34	76.00	-36.66	peak	
2		1607.500	29.57	-0.31	29.26	56.00	-26.74	AVG	
3		2530.000	40.97	4.07	45.04	76.00	-30.96	peak	
4	*	2530.000	31.84	4.07	35.91	56.00	-20.09	AVG	
5		3452.500	35.52	8.11	43.63	80.00	-36.37	peak	
6		3452.500	25.46	8.11	33.57	60.00	-26.43	AVG	
7		3990.000	34.40	9.40	43.80	80.00	-36.20	peak	
8		3990.000	24.33	9.40	33.73	60.00	-26.27	AVG	
9		4680.000	33.54	11.49	45.03	80.00	-34.97	peak	
10		4680.000	24.22	11.49	35.71	60.00	-24.29	AVG	
11		5450.000	32.87	14.64	47.51	80.00	-32.49	peak	
12		5450.000	24.30	14.64	38.94	60.00	-21.06	AVG	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1050.000	43.35	-4.21	39.14	76.00	-36.86	peak	
2		1050.000	32.90	-4.21	28.69	56.00	-27.31	AVG	
3		1992.500	38.16	2.77	40.93	76.00	-35.07	peak	
4		1992.500	27.77	2.77	30.54	56.00	-25.46	AVG	
5		2530.000	38.60	4.07	42.67	76.00	-33.33	peak	
6		2530.000	28.52	4.07	32.59	56.00	-23.41	AVG	
7		4005.000	35.83	9.43	45.26	80.00	-34.74	peak	
8		4005.000	27.34	9.43	36.77	60.00	-23.23	AVG	
9		4787.500	34.09	11.96	46.05	80.00	-33.95	peak	
10		4787.500	25.18	11.96	37.14	60.00	-22.86	AVG	
11		6000.000	32.77	16.61	49.38	80.00	-30.62	peak	
12	*	6000.000	22.54	16.61	39.15	60.00	-20.85	AVG	

3.3 CONDUCTED EMISSION MEASUREMENT AT AC MAINS POWER PORTS

3.3.1 LIMITS

Requirements for conducted emissions from AC mains power ports of Class A equipment

Frequency Range MHz	Coupling Device	Detector Type / bandwidth	Class A Limits (dB(μV))
0.15 - 0.5	AMN	Quasi Peak / 9 kHz	79
0.5 - 30			73
0.15 - 0.5	AMN	Average / 9 kHz	66
0.5 - 30			60

NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)

Margin Level = Measurement Value – Limit Value

3.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	100526	Jul. 03, 2023
2	EMI Test Receiver	R&S	ESR3	101862	Jan. 08, 2024
3	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Jan. 08, 2024
4	Cable	N/A	RG400	N/A(12m)	Mar. 02, 2024
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.

All calibration period of equipment list is one year.

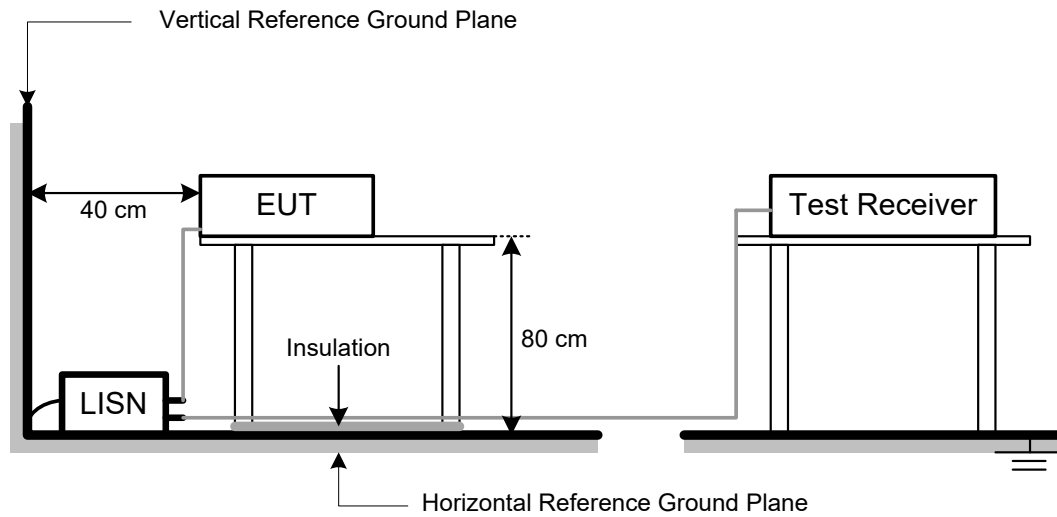
3.3.3 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.4 DEVIATION FROM TEST STANDARD

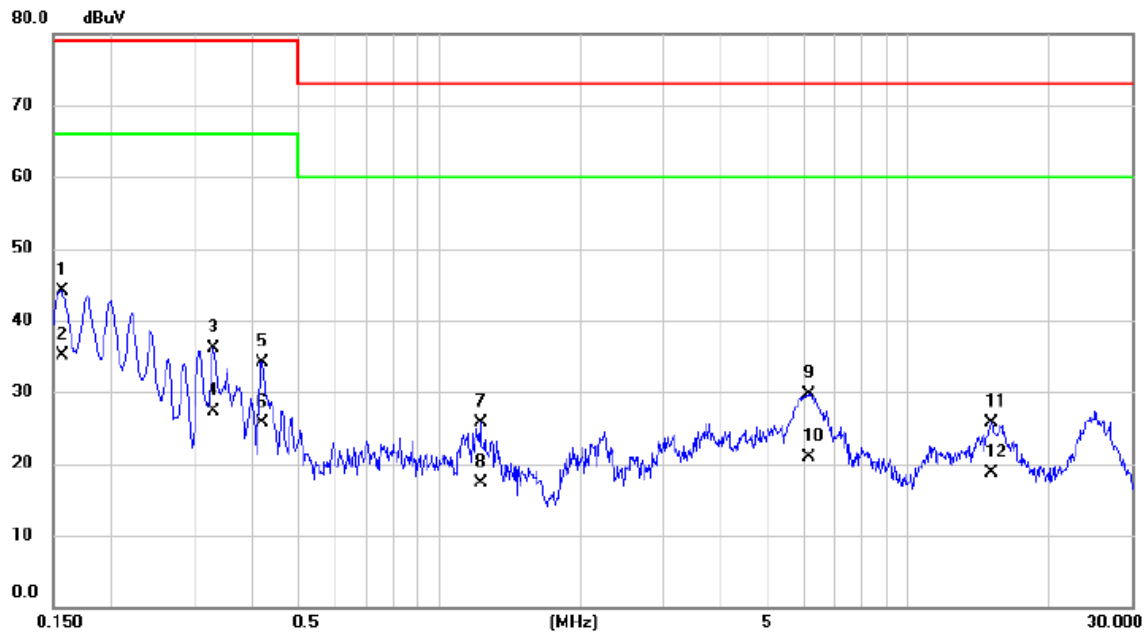
No deviation

3.3.5 TEST SETUP



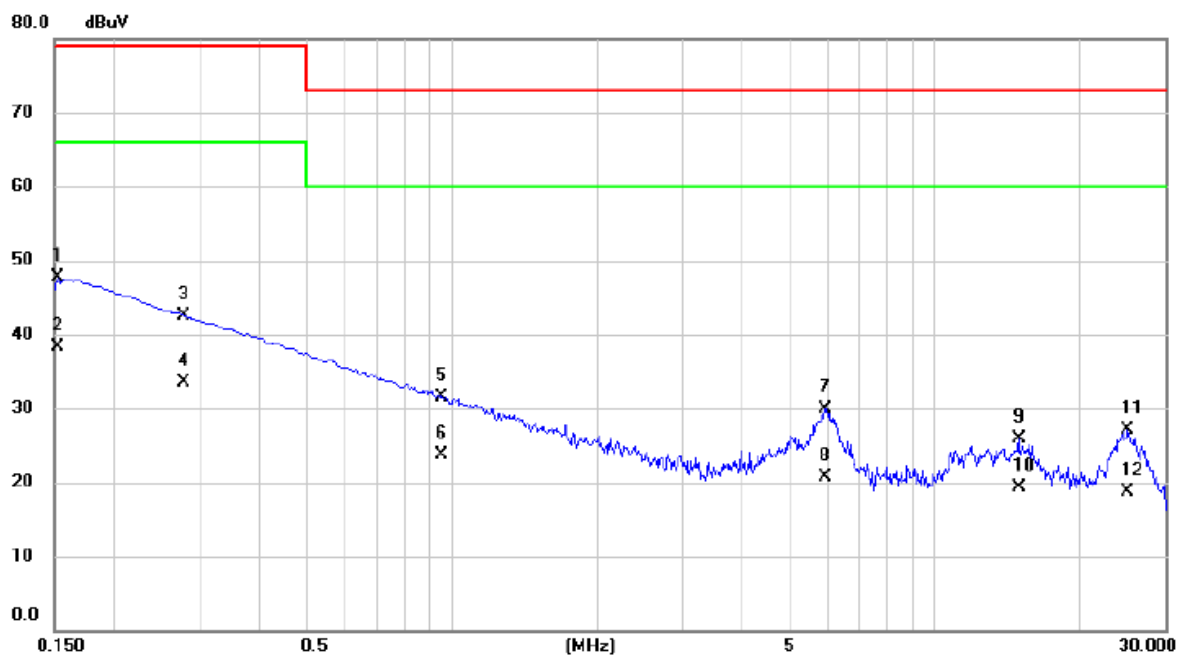
3.3.6 TEST RESULTS

Test Voltage	AC 230V/50Hz	Phase	Line
Test Mode	Mode 1		



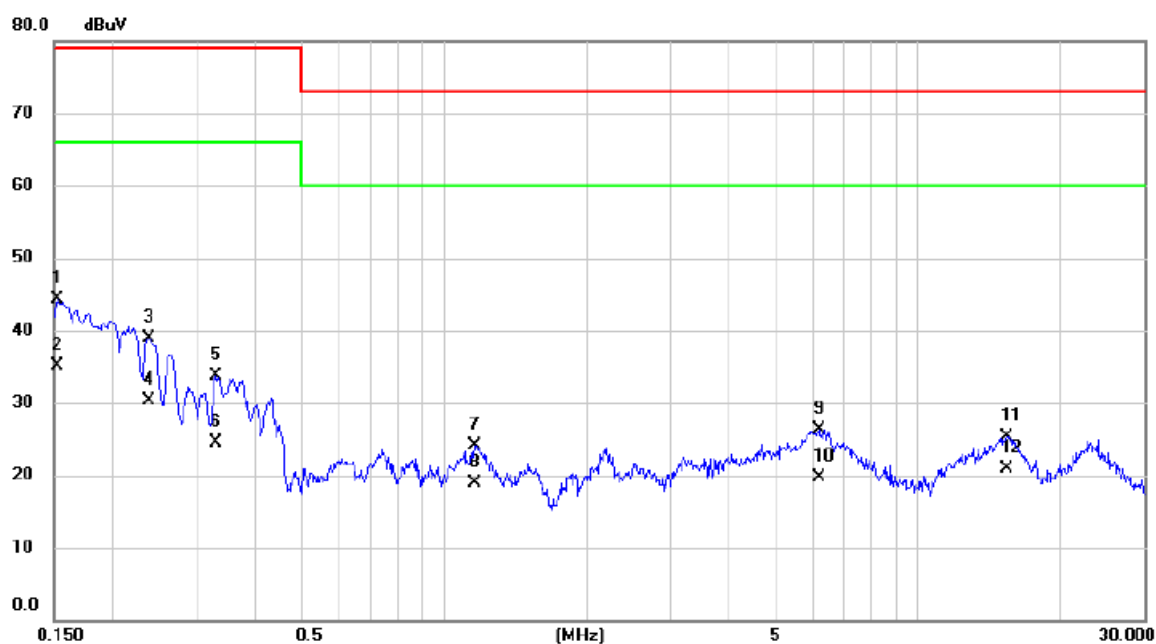
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1568	34.15	9.97	44.12	79.00	-34.88	QP	
2	*	0.1568	25.20	9.97	35.17	66.00	-30.83	AVG	
3		0.3300	26.04	10.00	36.04	79.00	-42.96	QP	
4		0.3300	17.30	10.00	27.30	66.00	-38.70	AVG	
5		0.4200	24.15	10.01	34.16	79.00	-44.84	QP	
6		0.4200	15.60	10.01	25.61	66.00	-40.39	AVG	
7		1.2255	15.53	10.08	25.61	73.00	-47.39	QP	
8		1.2255	7.20	10.08	17.28	60.00	-42.72	AVG	
9		6.1530	19.40	10.38	29.78	73.00	-43.22	QP	
10		6.1530	10.52	10.38	20.90	60.00	-39.10	AVG	
11		15.0248	14.98	10.70	25.68	73.00	-47.32	QP	
12		15.0248	8.10	10.70	18.80	60.00	-41.20	AVG	

Test Voltage	AC 230V/50Hz	Phase	Neutral
Test Mode	Mode 1		



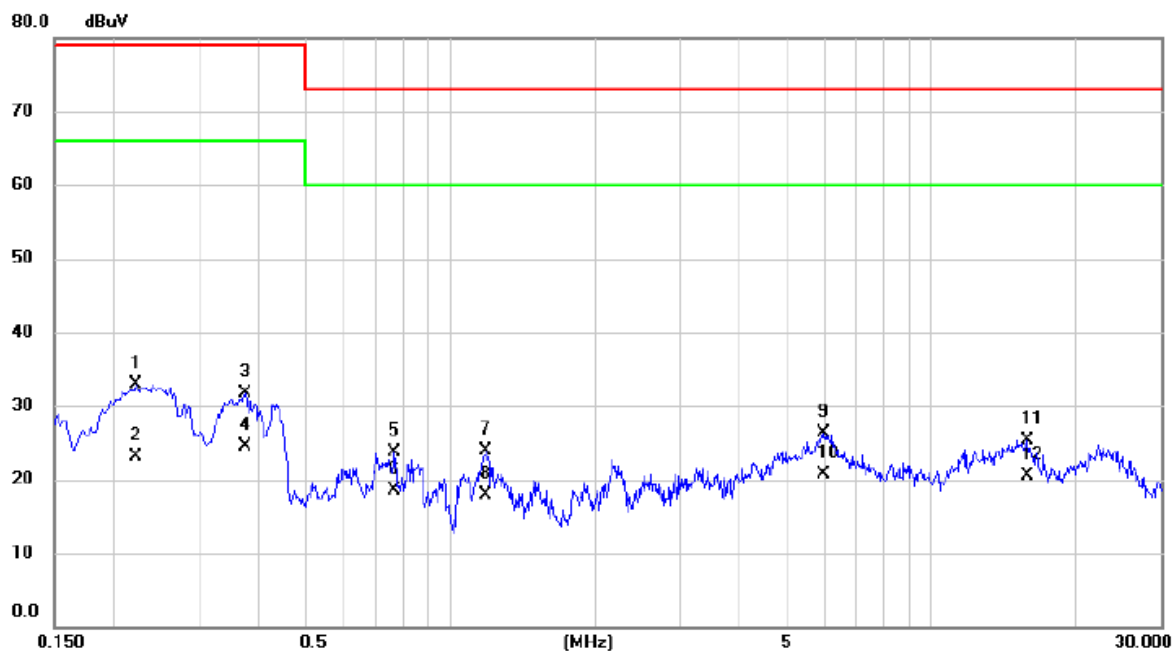
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	37.66	9.96	47.62	79.00	-31.38	QP	
2	*	0.1522	28.30	9.96	38.26	66.00	-27.74	AVG	
3		0.2782	32.56	9.99	42.55	79.00	-36.45	QP	
4		0.2782	23.50	9.99	33.49	66.00	-32.51	AVG	
5		0.9532	21.53	10.05	31.58	73.00	-41.42	QP	
6		0.9532	13.60	10.05	23.65	60.00	-36.35	AVG	
7		5.9415	19.43	10.43	29.86	73.00	-43.14	QP	
8		5.9415	10.20	10.43	20.63	60.00	-39.37	AVG	
9		14.9663	14.91	11.02	25.93	73.00	-47.07	QP	
10		14.9663	8.20	11.02	19.22	60.00	-40.78	AVG	
11		25.0800	15.60	11.48	27.08	73.00	-45.92	QP	
12		25.0800	7.30	11.48	18.78	60.00	-41.22	AVG	

Test Voltage	AC 110V/60Hz	Phase	Line
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	34.28	9.97	44.25	79.00	-34.75	QP	
2	*	0.1522	25.10	9.97	35.07	66.00	-30.93	AVG	
3		0.2378	28.96	9.99	38.95	79.00	-40.05	QP	
4		0.2378	20.30	9.99	30.29	66.00	-35.71	AVG	
5		0.3300	23.67	10.00	33.67	79.00	-45.33	QP	
6		0.3300	14.50	10.00	24.50	66.00	-41.50	AVG	
7		1.1580	14.09	10.07	24.16	73.00	-48.84	QP	
8		1.1580	8.80	10.07	18.87	60.00	-41.13	AVG	
9		6.1710	15.86	10.38	26.24	73.00	-46.76	QP	
10		6.1710	9.40	10.38	19.78	60.00	-40.22	AVG	
11		15.3555	14.62	10.71	25.33	73.00	-47.67	QP	
12		15.3555	10.20	10.71	20.91	60.00	-39.09	AVG	

Test Voltage	AC 110V/60Hz	Phase	Neutral
Test Mode	Mode 1		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2220	22.95	9.97	32.92	79.00	-46.08	QP	
2		0.2220	13.20	9.97	23.17	66.00	-42.83	AVG	
3		0.3750	21.80	10.00	31.80	79.00	-47.20	QP	
4		0.3750	14.50	10.00	24.50	66.00	-41.50	AVG	
5		0.7642	13.60	10.03	23.63	73.00	-49.37	QP	
6		0.7642	8.40	10.03	18.43	60.00	-41.57	AVG	
7		1.1850	13.91	10.06	23.97	73.00	-49.03	QP	
8		1.1850	7.90	10.06	17.96	60.00	-42.04	AVG	
9		5.9527	15.94	10.43	26.37	73.00	-46.63	QP	
10	*	5.9527	10.20	10.43	20.63	60.00	-39.37	AVG	
11		15.7830	14.19	11.09	25.28	73.00	-47.72	QP	
12		15.7830	9.40	11.09	20.49	60.00	-39.51	AVG	

3.4 HARMONIC CURRENT EMISSIONS TEST

3.4.1 LIMITS

The power consumption is less than 75W, there is no limit applied.

3.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonics and Flicker Analyzer	California Instruments	PACS-1	72344	Jul. 03, 2023
2	3KVA AC Power source	California Instruments	3001ix	56309	Jul. 03, 2023
3	Measurement Software	California	CTS4.0 Version 4.29	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

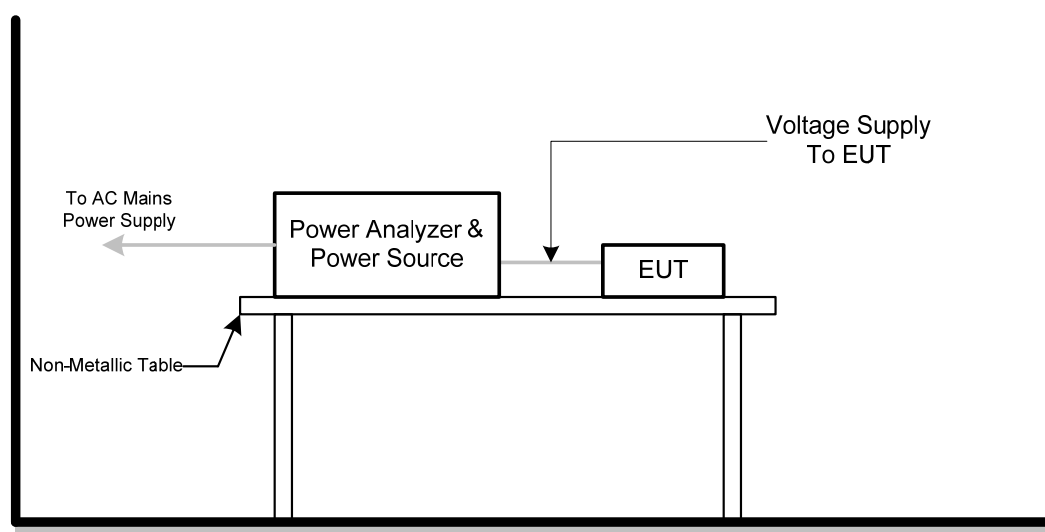
3.4.3 TEST PROCEDURE

- 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.
- The classification of EUT is according to of EN IEC 61000-3-2. The EUT is classified as Class A.
- 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.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation

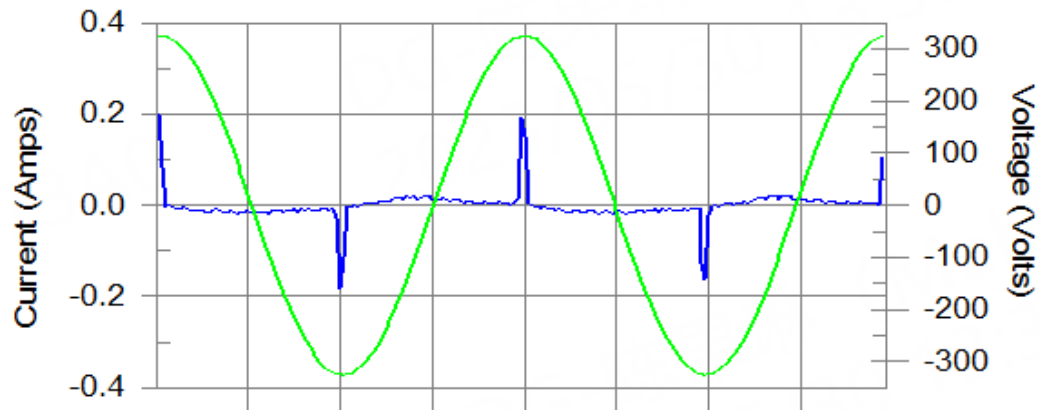
3.4.5 TEST SETUP



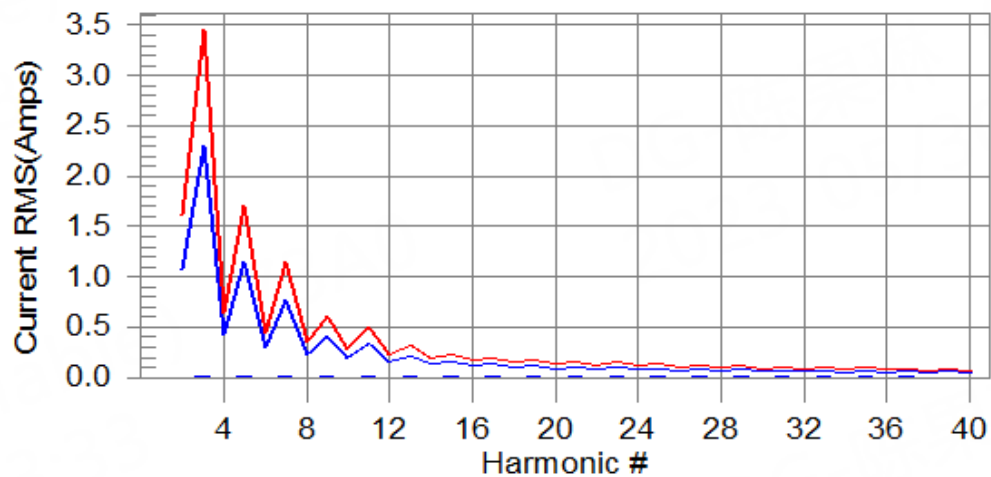
3.4.6 TEST RESULTS

Harmonics – Class-A	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonics H25-4.4% of 150% limit, H25-6.5% of 100% limit

Current Test Result Summary (Run time)	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Highest parameter values during test:

V RMS (Volts):	229.94	Frequency(Hz):	50.00
I Peak (Amps):	0.214	I RMS (Amps):	0.034
I Fund (Amps):	0.015	Crest Factor:	6.474
Power (Watts):	2.3	Power Factor:	0.307

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.002	1.620	N/A	Pass
3	0.009	2.300	0.4	0.011	3.450	0.3	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.009	1.140	0.8	0.010	1.710	0.6	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.009	0.770	1.2	0.009	1.155	0.8	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.009	0.400	2.2	0.009	0.600	1.5	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.009	0.330	2.6	0.009	0.495	1.7	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.008	0.210	3.9	0.008	0.315	2.7	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.008	0.150	5.3	0.008	0.225	3.6	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.008	0.132	5.7	0.008	0.198	3.8	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.007	0.118	6.0	0.007	0.178	4.1	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.007	0.107	6.3	0.007	0.161	4.2	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.006	0.098	6.5	0.006	0.147	4.3	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.006	0.090	6.5	0.006	0.135	4.4	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.005	0.083	6.5	0.005	0.125	4.4	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.005	0.078	N/A	0.005	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.004	0.073	N/A	0.005	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.004	0.068	N/A	0.004	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.004	0.064	N/A	0.004	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.003	0.061	N/A	0.003	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.003	0.058	N/A	0.003	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Voltage Source Verification Data (Run time)	
Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Highest parameter values during test:

Voltage (Vrms):	229.94	Frequency(Hz):	50.00
I _{Peak} (Amps):	0.214	I _{RMS} (Amps):	0.034
I _{Fund} (Amps):	0.015	Crest Factor:	6.474
Power (Watts):	2.3	Power Factor:	0.307

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.120	0.460	26.04	OK
3	0.521	2.069	25.17	OK
4	0.061	0.460	13.26	OK
5	0.067	0.919	7.31	OK
6	0.035	0.460	7.69	OK
7	0.039	0.690	5.59	OK
8	0.022	0.460	4.76	OK
9	0.036	0.460	7.93	OK
10	0.020	0.460	4.43	OK
11	0.018	0.230	7.91	OK
12	0.017	0.230	7.23	OK
13	0.021	0.230	9.04	OK
14	0.016	0.230	7.08	OK
15	0.013	0.230	5.79	OK
16	0.016	0.230	7.01	OK
17	0.009	0.230	4.10	OK
18	0.014	0.230	6.00	OK
19	0.013	0.230	5.44	OK
20	0.017	0.230	7.51	OK
21	0.012	0.230	5.22	OK
22	0.013	0.230	5.64	OK
23	0.012	0.230	5.04	OK
24	0.004	0.230	1.86	OK
25	0.011	0.230	4.69	OK
26	0.009	0.230	3.71	OK
27	0.011	0.230	4.71	OK
28	0.007	0.230	3.15	OK
29	0.005	0.230	2.29	OK
30	0.006	0.230	2.62	OK
31	0.009	0.230	3.71	OK
32	0.005	0.230	2.36	OK
33	0.008	0.230	3.62	OK
34	0.003	0.230	1.36	OK
35	0.009	0.230	3.75	OK
36	0.004	0.230	1.61	OK
37	0.004	0.230	1.79	OK
38	0.003	0.230	1.43	OK
39	0.007	0.230	3.03	OK
40	0.007	0.230	2.95	OK

3.5 VOLTAGE FLUCTUATIONS (FLICKER) TEST

3.5.1 LIMITS

Tests	Limits	Descriptions
	EN 61000-3-3	
Pst	≤ 1.0 , Tp= 10 min.	Short Term Flicker Indicator
Plt	≤ 0.65 , Tp=2 hr.	Long Term Flicker Indicator
dc	$\leq 3.3\%$	Relative Steady-State V-Chang
dmax	$\leq 4\%$	Maximum Relative V-change
d (t)	≤ 500 ms	Relative V-change characteristic

3.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonics and Flicker Analyzer	California Instruments	PACS-1	72344	Jul. 03, 2023
2	3KVA AC Power source	California Instruments	3001ix	56309	Jul. 03, 2023
3	Measurement Software	California	CTS4.0 Version 4.29	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

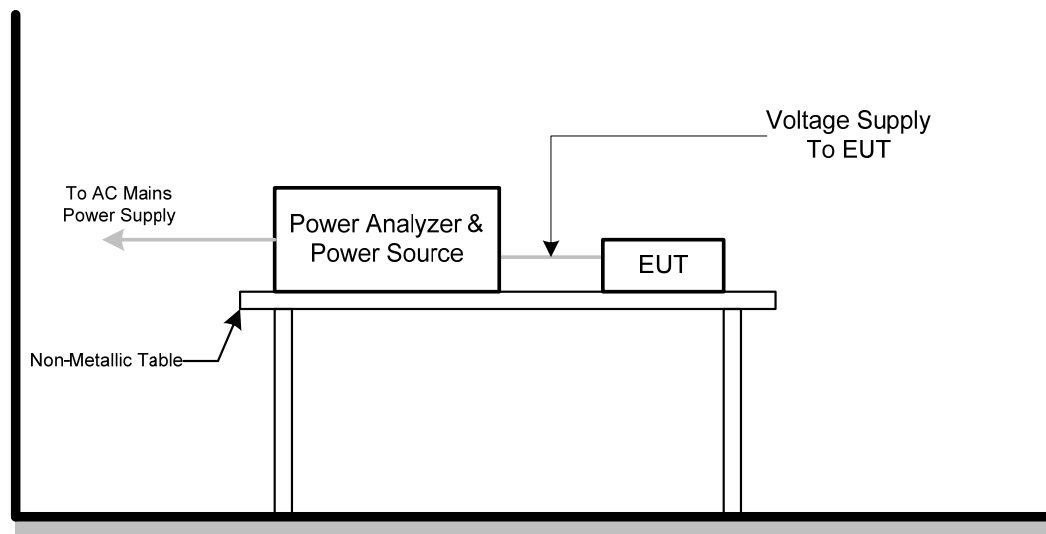
3.5.3 TEST PROCEDURE

- Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in EN 61000-3-3 depend on which standard adopted for compliance measurement.
- All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.5.4 DEVIATION FROM TEST STANDARD

No deviation

3.5.5 TEST SETUP

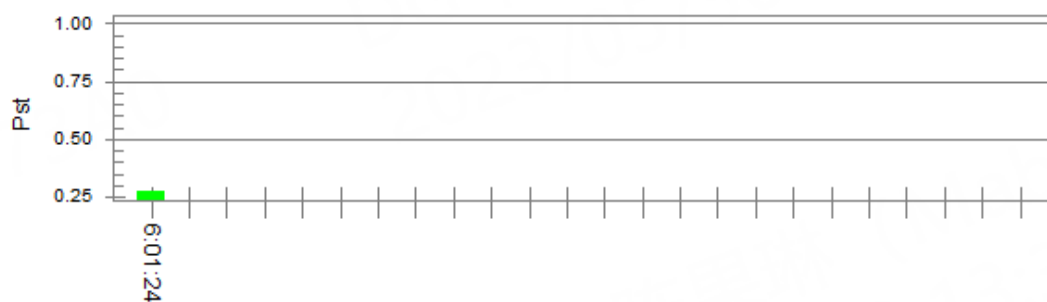


3.5.6 TEST RESULTS

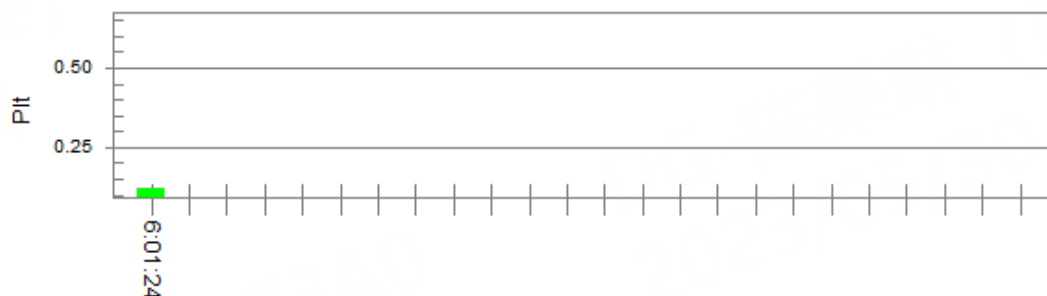
Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.91

Highest dt (%):

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.273

Highest Plt (2 hr. period): 0.119

Test limit (%):

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass

Test limit: 0.650 Pass

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

Tests Standard No.	Test Specification Level / Test Mode	Test Ports	Criteria
Electrostatic discharge IEC 61000-4-2 (ESD)	±8kV air discharge ±4kV contact discharge (Direct Mode)	Enclosure	B
	±4kV HCP discharge ±4kV VCP discharge (Indirect Mode)	Enclosure	B
Continuous RF electromagnetic field disturbances,swept test IEC 61000-4-3 (RS)	80 MHz to 1000 MHz 3V/m(unmodulated, r.m.s), 1 kHz, 80%, AM modulated	Enclosure	A
Continuous RF electromagnetic field disturbances,spot test IEC 61000-4-3 (RS)	1800 MHz, 2600MHz, 3500 MHz, 5000MHz(±1 %) 3V/m(unmodulated, r.m.s), 1 kHz, 80%, AM modulated	Enclosure	A
Electrical fast transient/burst immunity IEC 61000-4-4 (EFT)	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency (100kHz Repetition Frequency for xDSL port)	Analogue/digital data ports (NOTE 2)	B
	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	DC network power ports (NOTE 2)	B
	±1 kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	AC mains power ports	B

Surge immunity IEC 61000-4-5 (Surge)	Port Type: unshielded symmetrical		
	Apply: lines to ground		
	Primary protection is Intended ±1 kV and ±4 kV 10/700(5/320)Tr/Th μs	Analogue/digital data ports (NOTE 1) & (NOTE 2)	C
	Primary protection is not Intended ±1 kV 10/700(5/320) Tr/Th μs		C
	Port type: coaxial or shielded		
	Apply: shield to ground		
±0.5 kV 1.2/50(8/20) Tr/Th μs	Analogue/digital data ports (NOTE 1) & (NOTE 2)	B	
	line to reference ground for each individual line: ±0.5 kV(peak) 1.2/50(8/20) Tr/Th μs	DC network power ports (NOTE 2)	B
	±1 kV(peak) 1.2/50(8/20) Tr/Th μs (line to line) ±2 kV(peak) 1.2/50(8/20) Tr/Th μs (line to earth or ground)	AC mains power ports	B
Continuous induced RF disturbances IEC 61000-4-6 (CS)	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	Analogue/digital data ports (NOTE 2)	A
	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	DC network power ports (NOTE 2)	A
	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	AC mains power ports	A

Power frequency magnetic field immunity IEC 61000-4-8 (PFMF)	50 Hz or 60Hz, 1A/m(r.m.s)	Enclosure	A
Voltage dips, short interruptions and voltage variations immunity IEC 61000-4-11 (Dips)	Voltage dips: Residual voltage < 5% 0.5 cycle Residual voltage < 70% 25 cycle(50Hz), 30 cycle (60Hz) Voltage interruptions: Residual voltage < 5% 250 cycle (50Hz), 300 cycle (60Hz)	AC Power Ports	B C C
Broadband impulse noise disturbances, repetitive (BIN-R)	0.15MHz to 0.5 MHz 107dBuV 0.5 MHz to 10 MHz 107dBuV to 36dBuV 10 MHz to 30 MHz 36dBuV to 30 dBuV	Analogue/digital data ports (Applicable only to CPE xDSL ports)	A
	0.70 ms 8.3 ms(for 60Hz) 10 ms(for 50Hz)	Analogue/digital data ports (Apply period based on the AC mains frequency)	A
Broadband impulse noise disturbances, isolated (BIN-I)	0.15MHz to 30 MHz 110dBuV	Analogue/digital data ports (Applicable only to CPE xDSL ports)	B
	0.24 ms 10 ms 300 ms	Analogue/digital data ports (Apply all burst durations)	B

Note.

- 1) Applicable only to ports which, according to the manufacturer's specification, may connect directly to outdoor cables.
- 2) Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m.

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 55035** standards, the general performance criteria as following:

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Criterion B	During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 ANNEX B (NORMATIVE) - PRINT FUNCTION

4.3.1 PERFORMANCE CRITERIA

Performance criterion A:

Apply criterion A as defined in GENERAL PERFORMANCE CRITERIA . Additionally, the following shall not occur as a consequence of the application of the disturbance:

- change of operating state;
- unintended pausing of the print operation;
- a change of print quality or legibility, as appropriate to the test pattern;
- change of character font;
- unintended line feed;
- unintended page feed;
- paper feed failure.

Performance criterion B:

Apply criterion B as defined in GENERAL PERFORMANCE CRITERIA with the following specifics and additional limitations.

Paper feed failures are allowed only if, after removal of the jammed sheets, the job is automatically recovered and there is no loss of printed information.

Any low-quality print output caused by the application of the disturbance shall not continue beyond the sheet of media being printed, or beyond the typical length of a finished page or sheet printed from continuous roll media.

False indicators are permitted during the test provided that a normal operator response to that false indicator is simple (such as pressing a button). False indicators are not acceptable if they would cause the user to discard printing supplies such as ink, toner or paper, when those supplies are actually not empty or faulty. Any false indicator shall either clear automatically or after the operator's response.

After the disturbance, the print function may print the remainder of the print job at a quality level within the manufacturer's specifications. Alternately, the print function may halt processing of a print job as a result of the disturbance, but only if the operator is capable of reprinting the job (for example, a fax printing job where the image to be printed still resides in local memory). Automatically restarting the print job from the beginning is also acceptable. In any scenario, the pairing of front and back images during double-sided printing shall be correct.

Performance criterion C:

Apply criterion C as defined in GENERAL PERFORMANCE CRITERIA.

4.4 ANNEX D (NORMATIVE) - DISPLAY AND DISPLAY OUTPUT FUNCTION

4.4.1 PERFORMANCE CRITERIA

Performance criterion A

for continuous radiated and conducted disturbances tests:

Apply criterion A as defined in GENERAL PERFORMANCE CRITERIA. Additionally, an increase in any degradation greater than just perceptible by observation of the image shall not occur as a consequence of the application of the test. Examples of such degradations are:

- superimposed patterning;
- positional disturbances due to synchronisation errors;
- geometric distortion;
- change of contrast or brightness;
- picture artefacts;
- freezing or disturbance of motion;
- image loss;
- video data or decoding errors.

Performance criterion A

for the power frequency magnetic field tests:

Alternative 1: A continuous magnetic field of 1 A/m:

The jitter (in mm) shall not exceed the value
$$\frac{(\text{character height in mm} + 0,3) \times 2,5}{33,3}$$

Performance criterion B:

Apply criterion B as defined in GENERAL PERFORMANCE CRITERIA.

Performance criterion C:

Apply criterion C as defined in GENERAL PERFORMANCE CRITERIA.

4.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.5.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Required Performance	B
Discharge Voltage	Air Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ Contact Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$
Polarity	Positive & Negative
Number of Discharge	20 times at each test point
Discharge Mode	Single Discharge
Discharge Period	1 second

4.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Generator	TESEQ AG	NSG 437	450	Nov. 14, 2023

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

4.5.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. 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.

NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger.

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.

NOTE 2 The points to which the discharges should be applied may be selected by means of an exploration carried out at a repetition rate of 20 discharges per second, or more.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

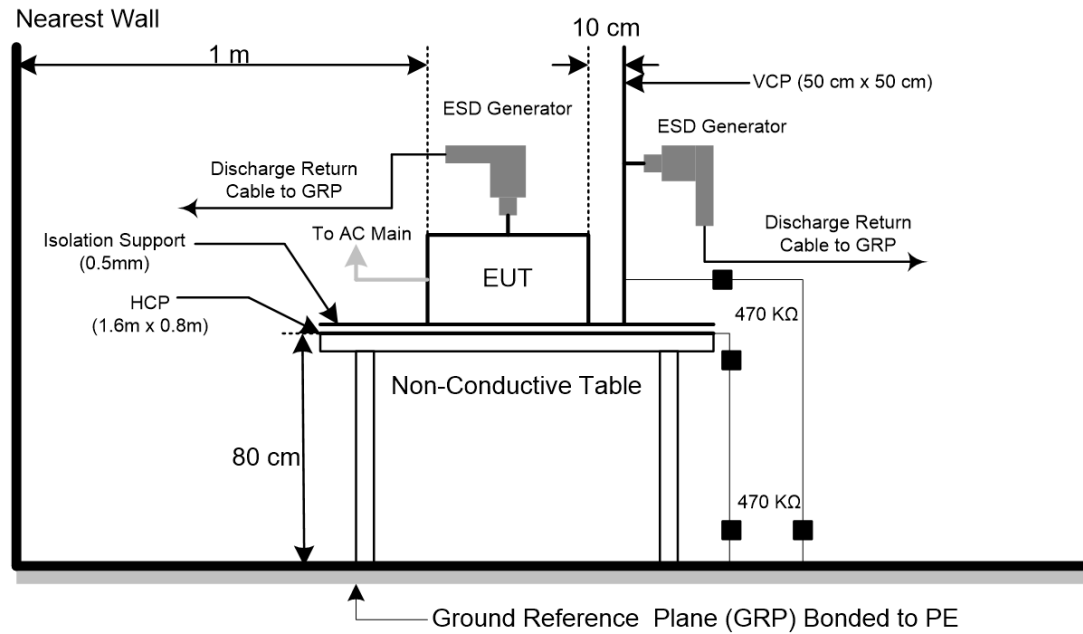
- b. For TABLE-TOP equipment:

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in IEC 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

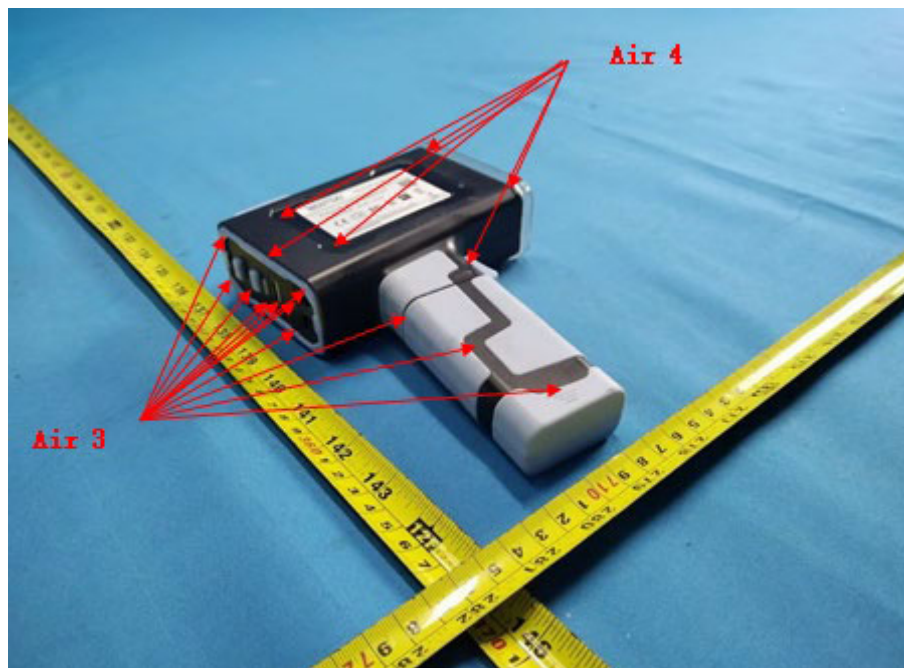
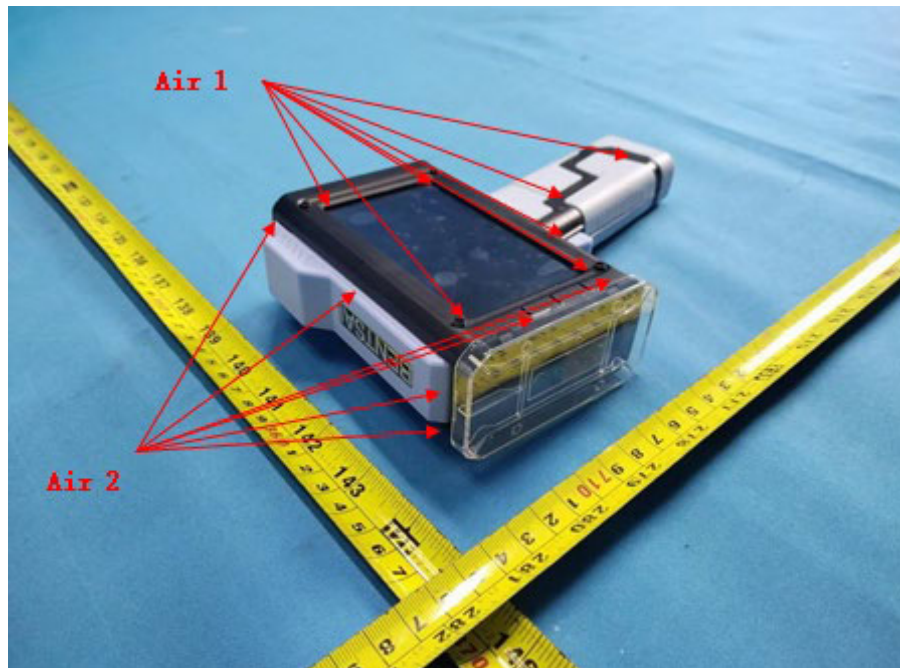
Mode	Air Discharge								Contact Discharge					
	2kV		4kV		8kV		- kV		4kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	B	B	B	B	-	-	-	-	-	-	-	-
2	A	A	B	B	B	B	-	-	-	-	-	-	-	-
3	A	A	B	B	B	B	-	-	-	-	-	-	-	-
4	A	A	B	B	B	B	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-
6	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B								B					
Result	B								N/A					

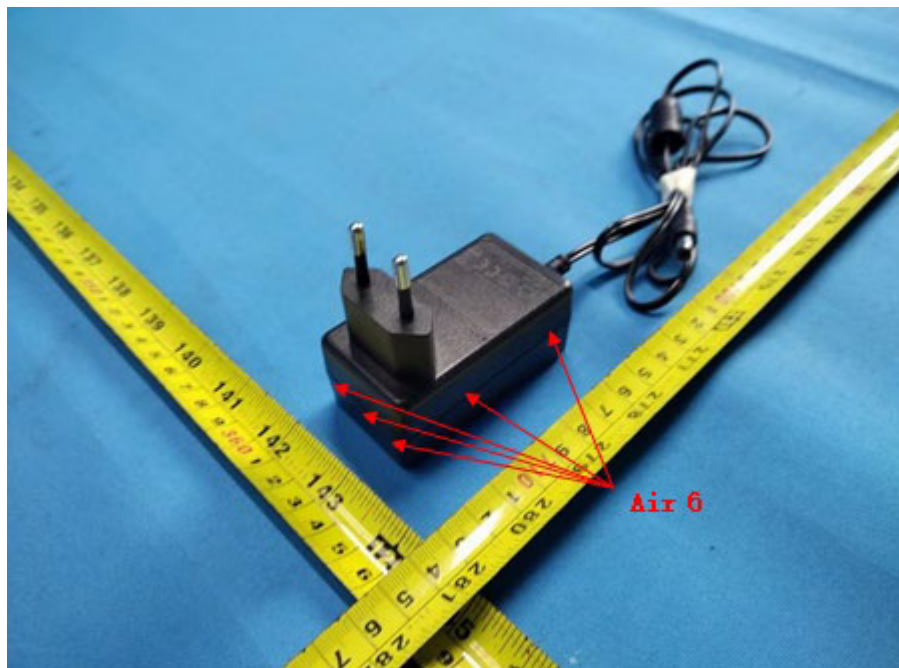
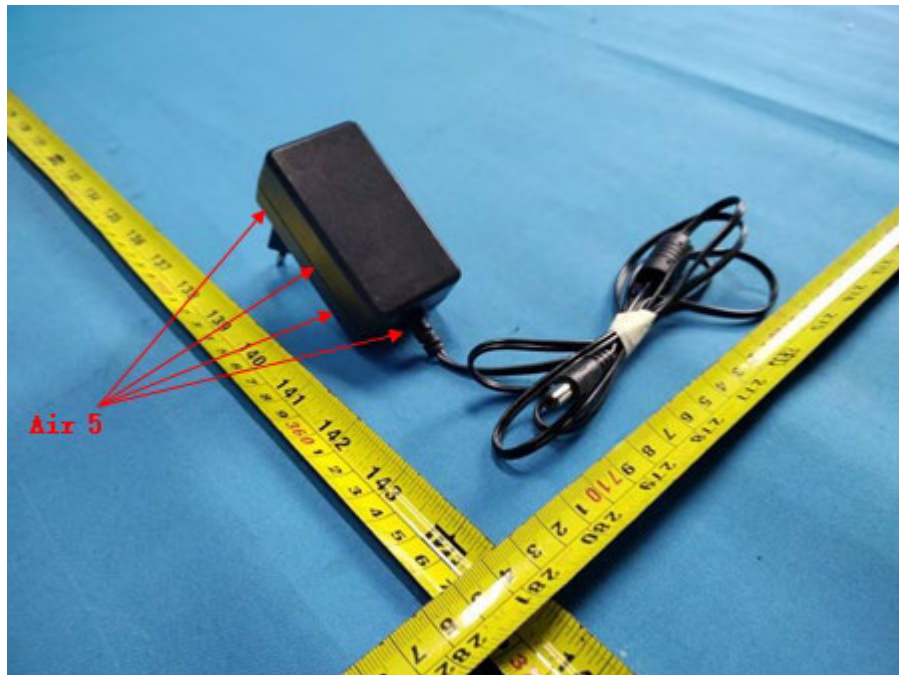
Mode	HCP Contact Discharge						VCP Contact Discharge					
	2kV		4kV		- kV		2kV		4 kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N
Left side	A	A	A	A	-	-	A	A	A	A	-	-
Right side	A	A	A	A	-	-	A	A	A	A	-	-
Front side	A	A	A	A	-	-	A	A	A	A	-	-
Rear side	A	A	A	A	-	-	A	A	A	A	-	-
Criteria	B						B					
Result	A						A					

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED





4.6 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

4.6.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-3
Required Performance	A
Frequency Range	80 MHz - 1000 MHz, 1800 MHz, 2600 MHz, 3500 MHz, 5000MHz ($\pm 1\%$)
Field Strength	3 V/m(unmodulated, r.m.s)
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.55 m
Dwell Time	3 seconds

4.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3142B	26419	Dec. 06, 2023
2	Amplifier	AR	50S1G4A	326720	Jan. 08, 2024
3	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Jul. 03, 2023
4	Power amplifier	MILMEGA	AS1860-50	1064834	Jan. 08, 2024
5	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9149	9149-277	Apr. 18, 2023
6	Power amplifier	MILMEGA	80RF1000-250	1064833	Jan. 08, 2024
7	Measurement Software	Farad	(EZ-RS)V2.0.1.3	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

4.6.3 TEST PROCEDURE

The EUT and support equipment are in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

For TABLE-TOP equipment:

The EUT installed in a representative system as described in IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

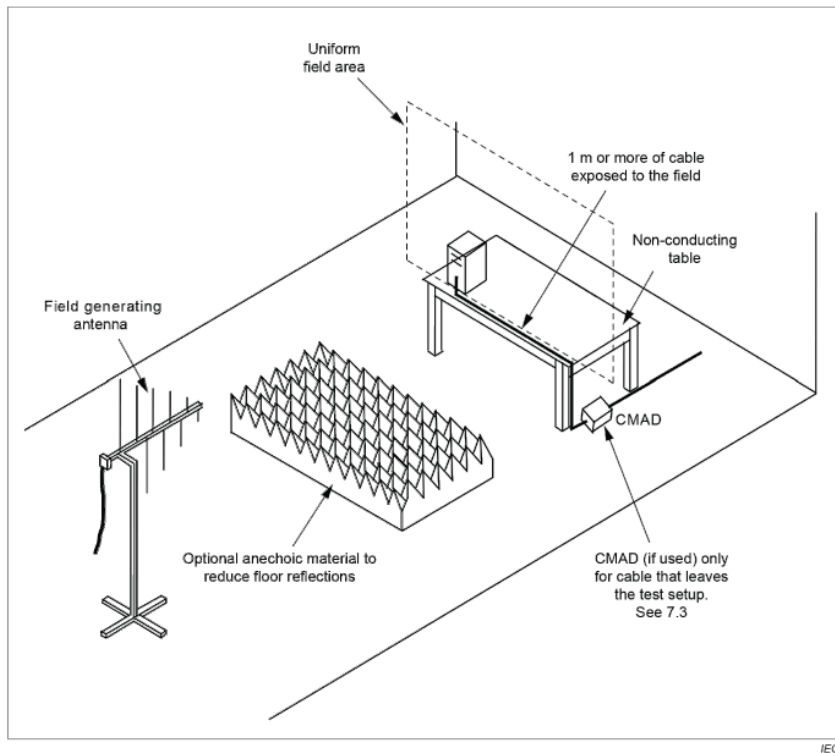
- The field strength level was 3 V/m(unmodulated, r.m.s).
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP

a) For Continuous induced RF disturbances



4.6.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Modulation	Azimuth	Criterion	Result
80 - 1000	H / V	3V/m	AM Modulated 1000Hz, 80%	0	A	A
				90		
				180		
				270		
1800, 2600, 3500, 5000 (±1%)	H / V	3V/m	AM Modulated 1000Hz, 80%	0	A	A
				90		
				180		
				270		

4.7 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

4.7.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-4
Required Performance	B
Test Voltage	AC mains power ports: ± 1 kV
Polarity	Positive & Negative
Impulse Frequency	5 kHz
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	1 min.

4.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Fast Transient Burst Simulator	Prima	EFT61004TA	PR190741004	Jul. 03, 2023
2	Measurement Software	Prima	EFT_Series V1.0.0.0.201 80710	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

4.7.3 TEST PROCEDURE

For TABLE-TOP equipment:

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m \pm 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

The diagram illustrates the test setup for the immunity test of a power supply unit (PSU) according to EN 61000-4-6:2007. It shows two configurations: (A) and (B).

Configuration (A): The PSU (EUT) is placed on an insulating support. A coupling/decoupling network (A) is connected to the AC mains supply. The EUT is connected to the AC mains supply via a coupling/decoupling network (A). The EUT is connected to the AC mains supply via a coupling/decoupling network (A). The EUT is connected to the AC mains supply via a coupling/decoupling network (A).

Configuration (B): The PSU (EUT) is placed on an insulating support. A capacitive coupling clamp is connected to the AC mains supply. The EUT is connected to the AC mains supply via a capacitive coupling clamp. The EUT is connected to the AC mains supply via a capacitive coupling clamp. The EUT is connected to the AC mains supply via a capacitive coupling clamp.

Common Components: The test setup includes an AC mains supply, an EFT/B generator (A), an EFT/B generator (B), a capacitive coupling clamp, a contact to the ground reference plane, an insulating support, a grounding cable, and a grounding connection according to the manufacturer's specification. The length of the grounding cable to be specified in the test plan.

Dimensions: The diagram specifies several dimensions: $>0,5\text{ m}$ for the distance between the AC mains supply and the EUT, $\geq 0,5\text{ m}$ for the distance between the EFT/B generator (A) and the EUT, $0,5\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (A), $1,0\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (B), $>0,5\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (B), $>0,5\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (B), $0,1\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (B), and $0,1\text{ m}$ for the distance between the AC mains supply and the EFT/B generator (B).

4.7.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

EUT Ports Tested		Polarity	Repetition Frequency	Test Level 1kV	Criterion	Result
AC Power Port	Line (L)	+	5 kHz	A	B	A
		-	5 kHz	A		
	Neutral (N)	+	5 kHz	A	B	A
		-	5 kHz	A		
	L+N	+	5 kHz	A	B	A
		-	5 kHz	A		

4.8 SURGE IMMUNITY TEST (SURGE)

4.8.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-5
Required Performance	B(AC mains power ports)
Wave-Shape	1.2/50(8/20) Tr/Th μ s combination wave
Test Voltage	AC mains power ports: ± 0.5 kV, ± 1 kV
Generator Source Impedance	2 Ω of the low-voltage power supply network.
Phase Angle, Polarity and Number of Tests	Five positive pulses line-to-neutral at 90° phase Five negative pulses line-to-neutral at 270° phase
Pulse Repetition Rate	1 time / min

4.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Lightning Surge Generator	Prima	SUG61005T B	PR190854067	Jul. 03, 2023
2	Measurement Software	Prima	SUG_Series V1.0.0.7.201 90827	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

4.8.3 TEST PROCEDURE

a. For EUT power supply:

The surge is to be 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 shall be 2 meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT :

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

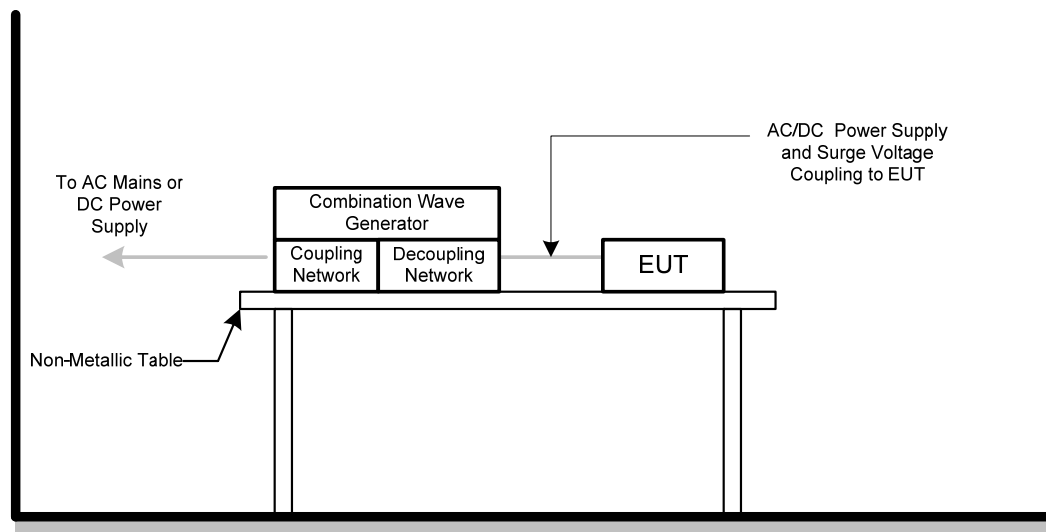
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT :

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



4.8.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Thµs						Criterion	Result
		Polarity	Phase	Voltage					
				0.5kV	1kV	-- kV	-- kV		
AC	L – N	+	90°	A	B	-	-	B	B
		-	270°	A	B	-	-		

4.9 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)

4.9.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-6
Required Performance	A
Frequency Range&Field Strength	0.15 MHz - 10 MHz: 3V (unmodulated, r.m.s.) 10 MHz - 30 MHz: 3V to 1V (unmodulated, r.m.s.) 30 MHz - 80 MHz: 1V (unmodulated, r.m.s.)
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Dwell Time	3 seconds

4.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1*	Attenuator	Teseq	100-SA-FFN-06	163357	Jan. 22, 2025
2	Power CDN	FCC	FCC-801-M2/M3-16A	100270	Jan. 08, 2024
3	TEST SYSTEM FOR CONDUCTED AND RADIATED IMMUNITY	TESEQ	NSG 4070B	37513	Jul. 03, 2023
4	Measurement Software	Farad	EZ-CS (V2.0.1.4)	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

"*" calibration period of equipment list is three year.

Except * item, all calibration period of equipment list is one year.

4.9.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

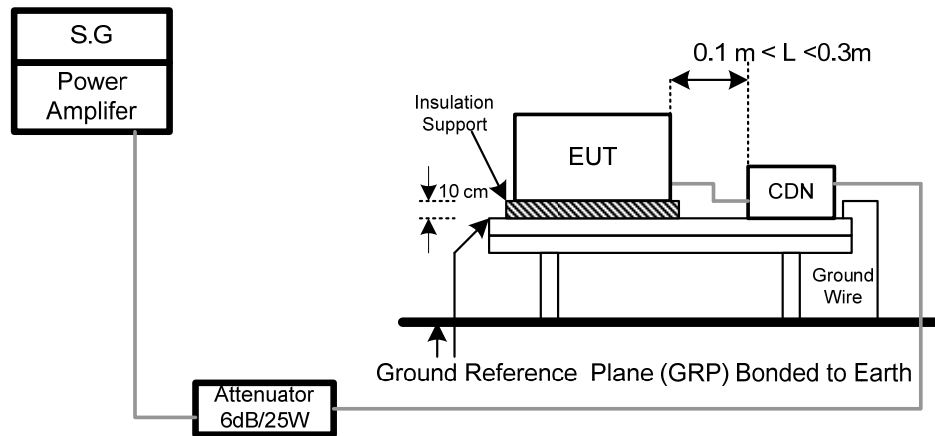
The other condition as following manner:

- The field strength level was 3 V (unmodulated, r.m.s.)
- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80%amplitude modulated with a 1 kHz sinewave. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.9.4 DEVIATION FROM TEST STANDARD

No deviation

4.9.5 TEST SETUP



4.9.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1

Test Ports (Mode)	Freq.Range (MHz)	Field Strength	Modulation	Criteria	Results
AC mains power ports	0.15 - 10	3V	AM Modulated 1000Hz, 80%	A	A
	10 - 30	3V to 1V			
	30 - 80	1V			

4.10 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

4.10.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-8
Required Performance	A
Frequency Range	50/60Hz
Field Strength	1 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1mx1m

4.10.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field test Generator	FCC	F-1000-4-8-G-125A	4032	Jan. 08, 2024
2	Magnetic Field immunity loop	Thermo KeyTek	F-1000-4-8/9/10-L-1M	4024	Jan. 08, 2024

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

4.10.3 TEST PROCEDURE

For TABLE-TOP equipment:

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

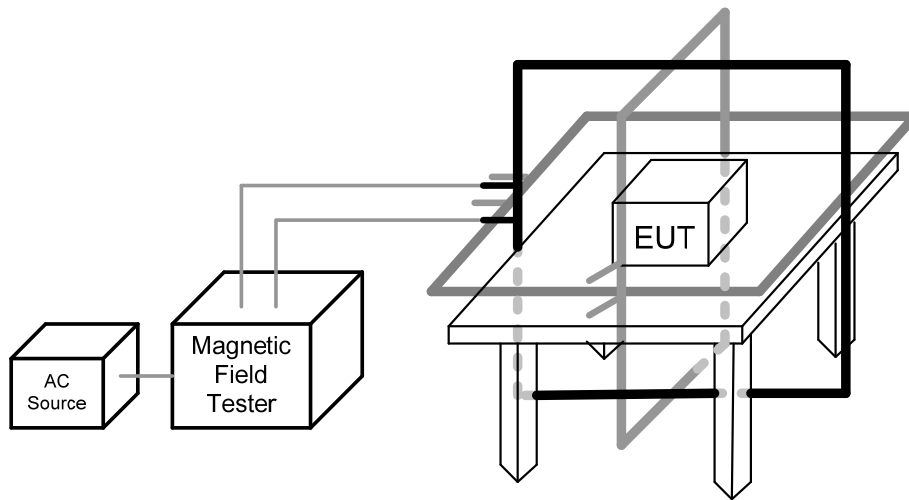
The other condition as following manner:

- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

4.10.4 DEVIATION FROM TEST STANDARD

No deviation

4.10.5 TEST SETUP



4.10.6 TEST RESULTS

Test Voltage	AC 230V/50
Test Mode	Mode 1

50Hz

Test Mode	Test Level	Antenna aspect	Duration	Criteria	Results
Enclosure	1 A/m	X	60s	A	A
Enclosure	1 A/m	Y	60s	A	A
Enclosure	1 A/m	Z	60s	A	A

60Hz

Test Mode	Test Level	Antenna aspect	Duration	Criteria	Results
Enclosure	1 A/m	X	60s	A	A
Enclosure	1 A/m	Y	60s	A	A
Enclosure	1 A/m	Z	60s	A	A

4.11 VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST (DIPS)

4.11.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-11
Required Performance	Voltage dips: B (For <5% residual voltage, dips) C (For 70% residual voltage, dips) C (For <5% residual voltage, Interruptions)
Interval between Event	Ten seconds
Phase Angle	0°/180°
Test Cycle	3 times

4.11.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cycle Sag Simulator	Prima	DRP61011T A	PR19076452	Nov. 14, 2023
2	Measurement Software	Prima	DRP_Series V1.0.0.3.201 90123	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

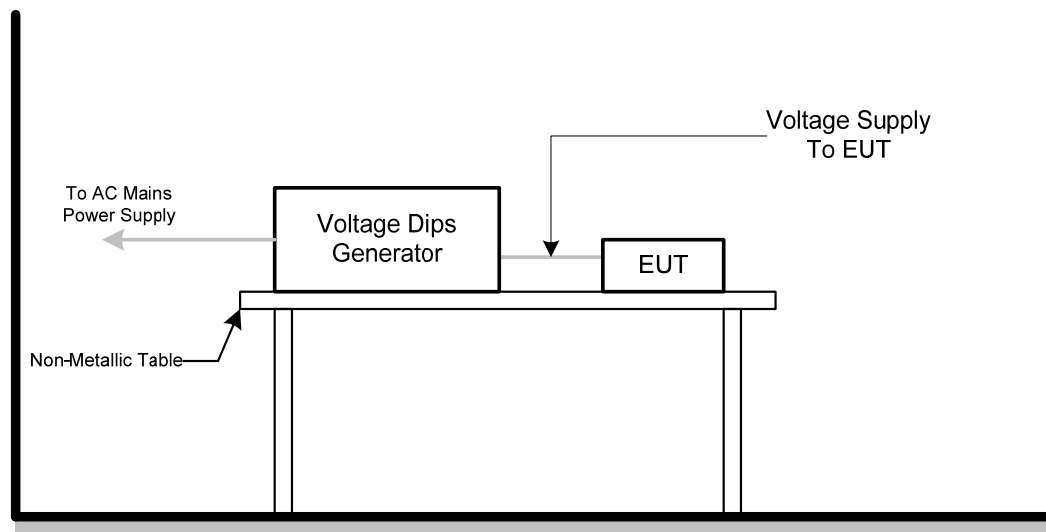
4.11.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (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.

4.11.4 DEVIATION FROM TEST STANDARD

No deviation

4.11.5 TEST SETUP



4.11.6 TEST RESULTS

Test Voltage	AC 100V/50Hz, AC 230V/50Hz, AC 240V/50Hz
Test Mode	Mode 1

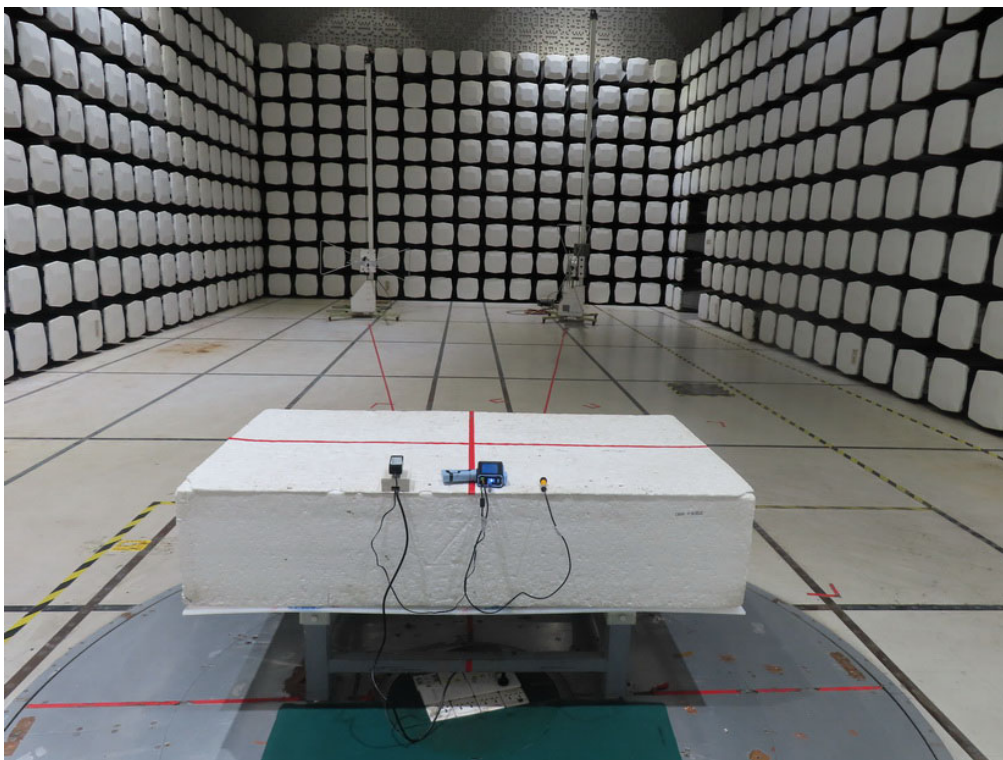
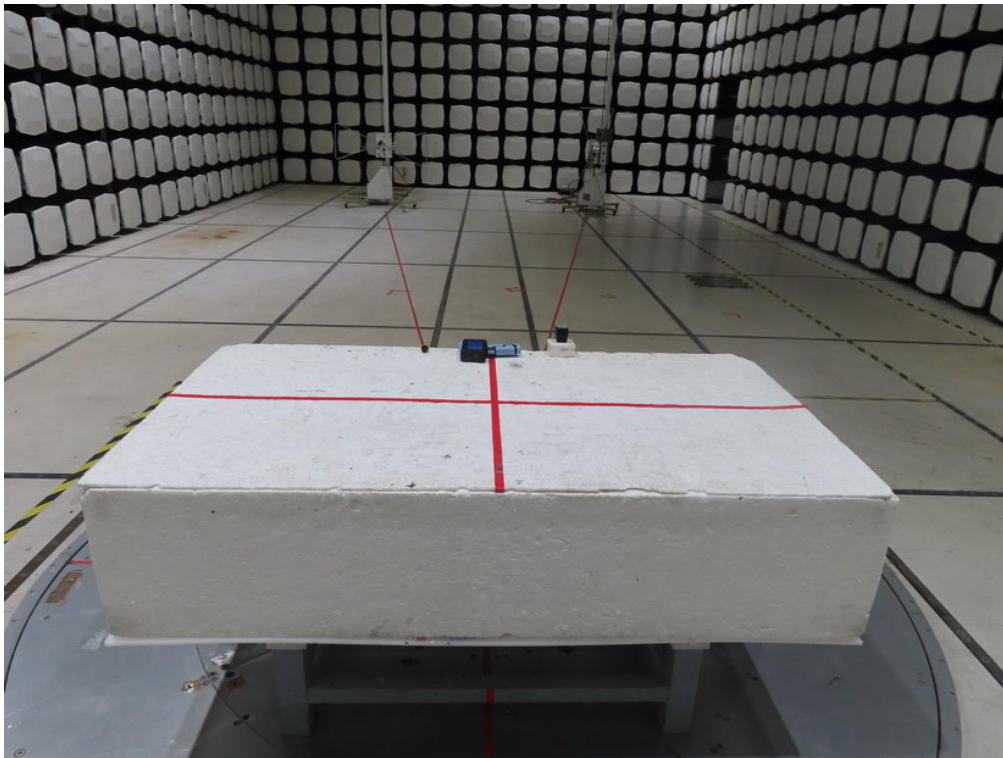
AC 100V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	B

AC 230V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	B

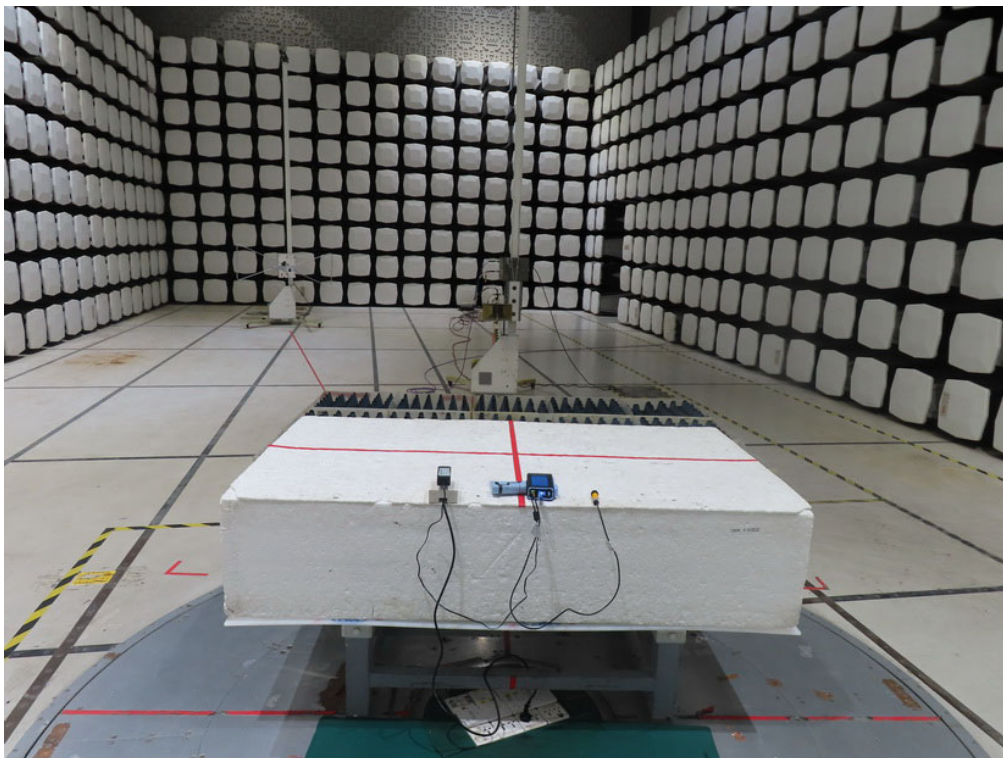
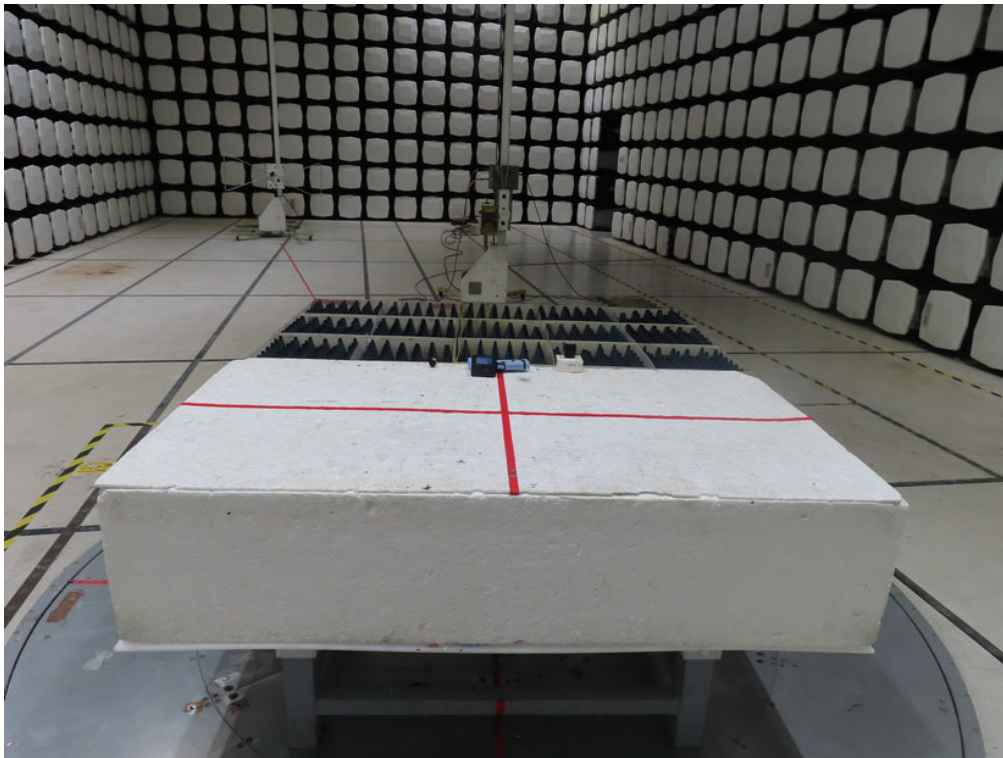
AC 240V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	B

5. EUT TEST PHOTO

Radiated emissions up to 1 GHz



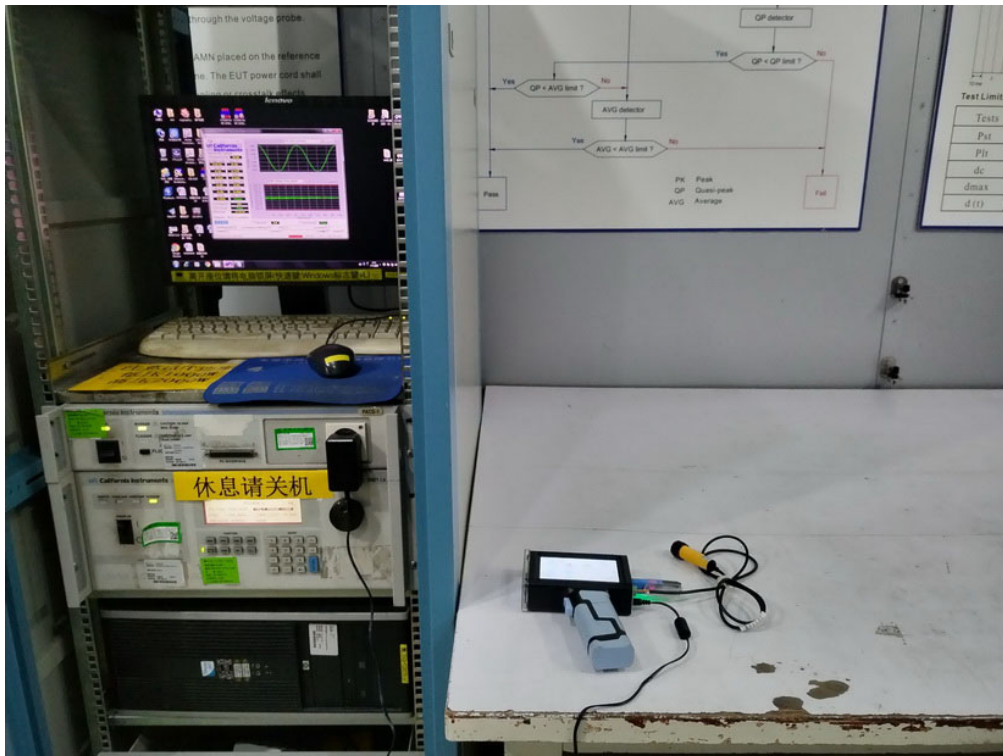
Radiated emissions above 1 GHz



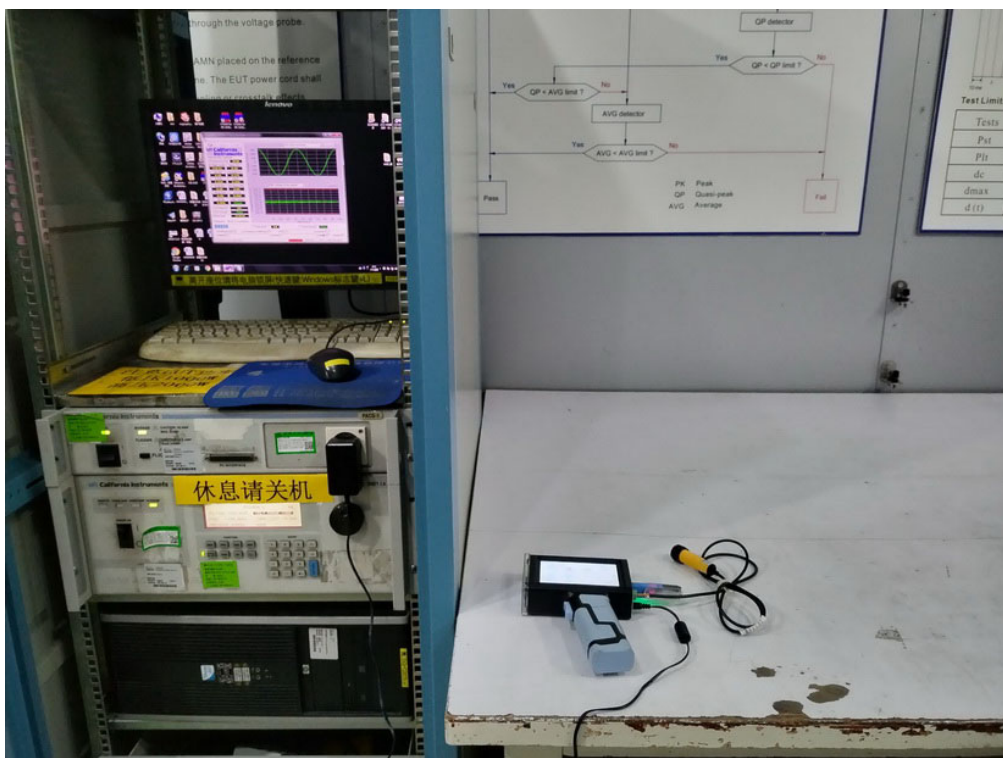
Conducted emissions AC mains power port



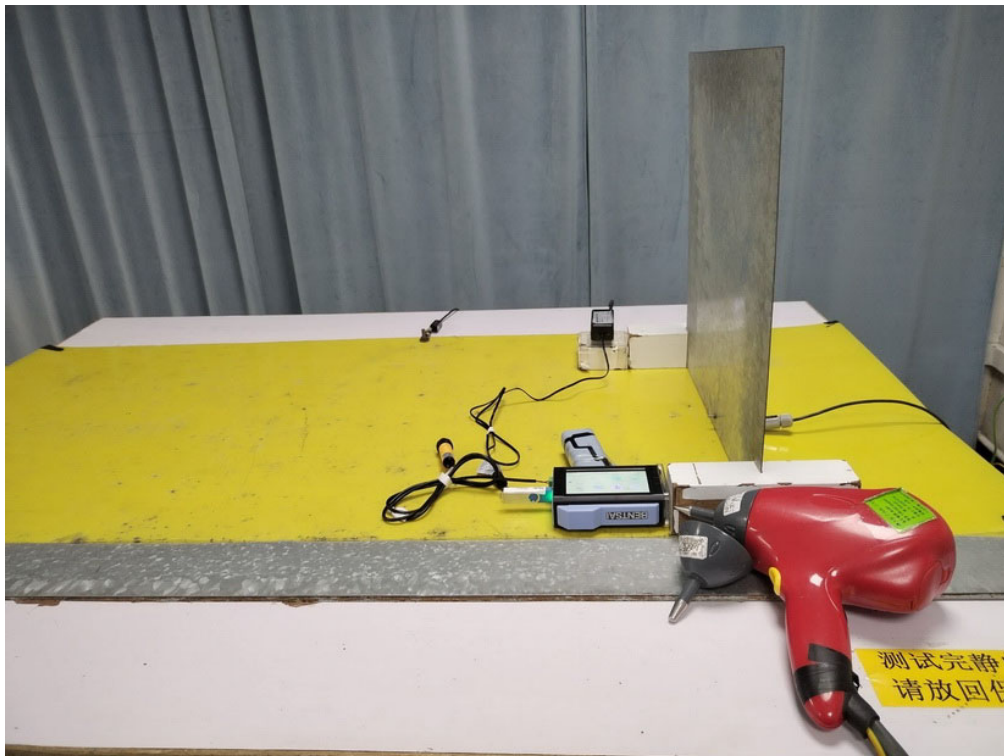
Harmonic current



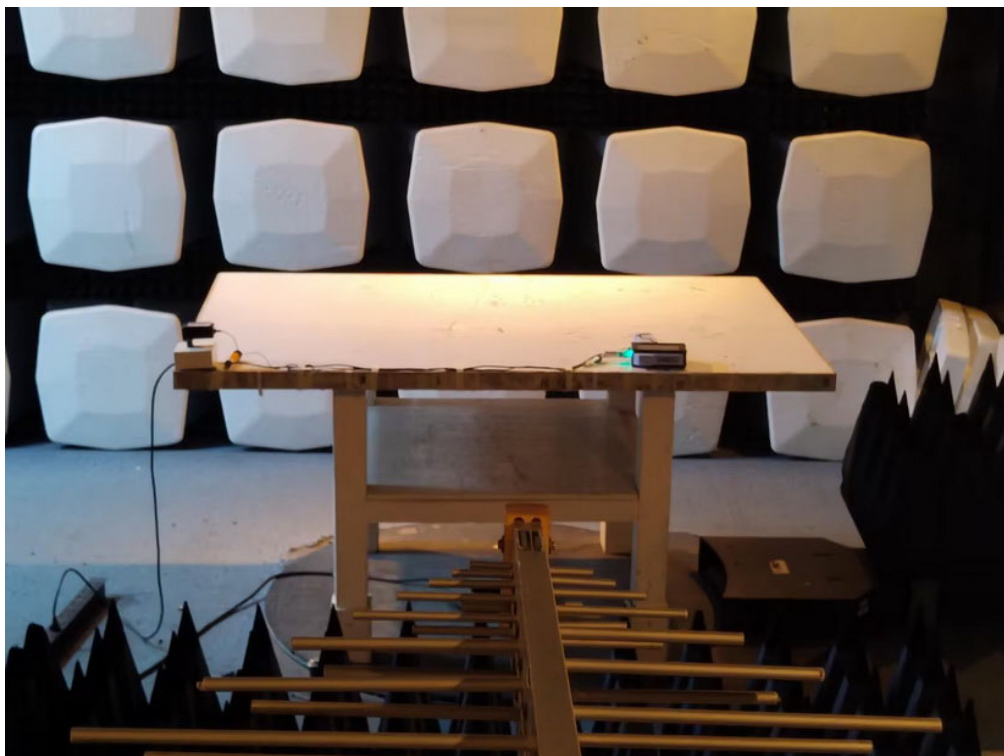
Voltage fluctuations (Flicker)



Electrostatic discharge immunity



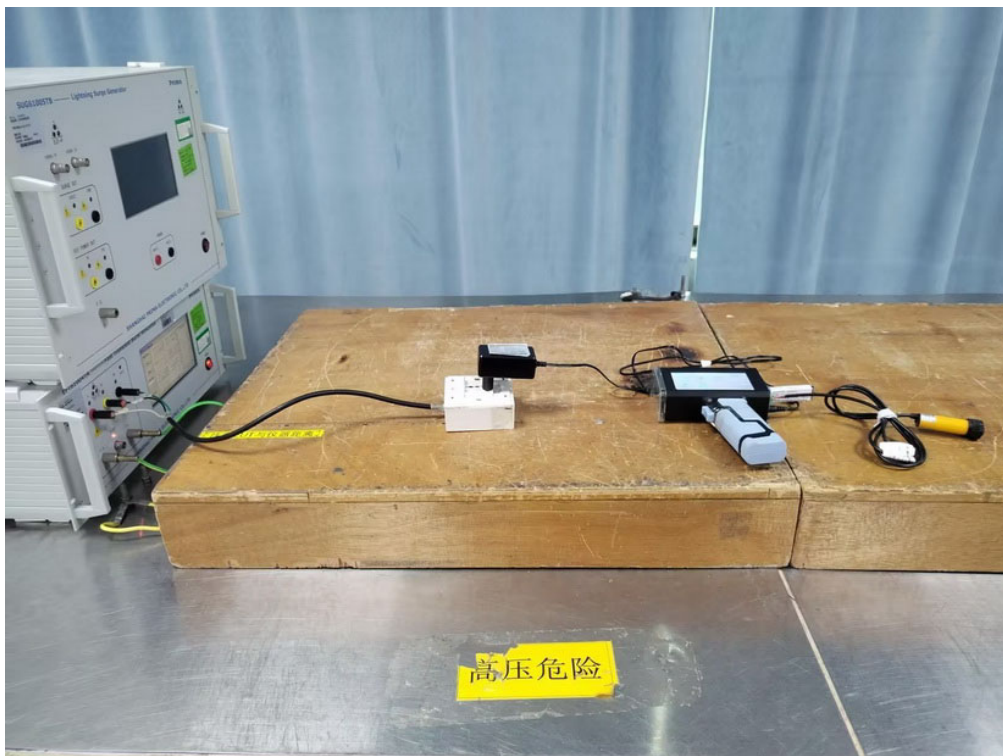
Radiated, radio-frequency, electromagnetic field immunity – Up to 1GHz



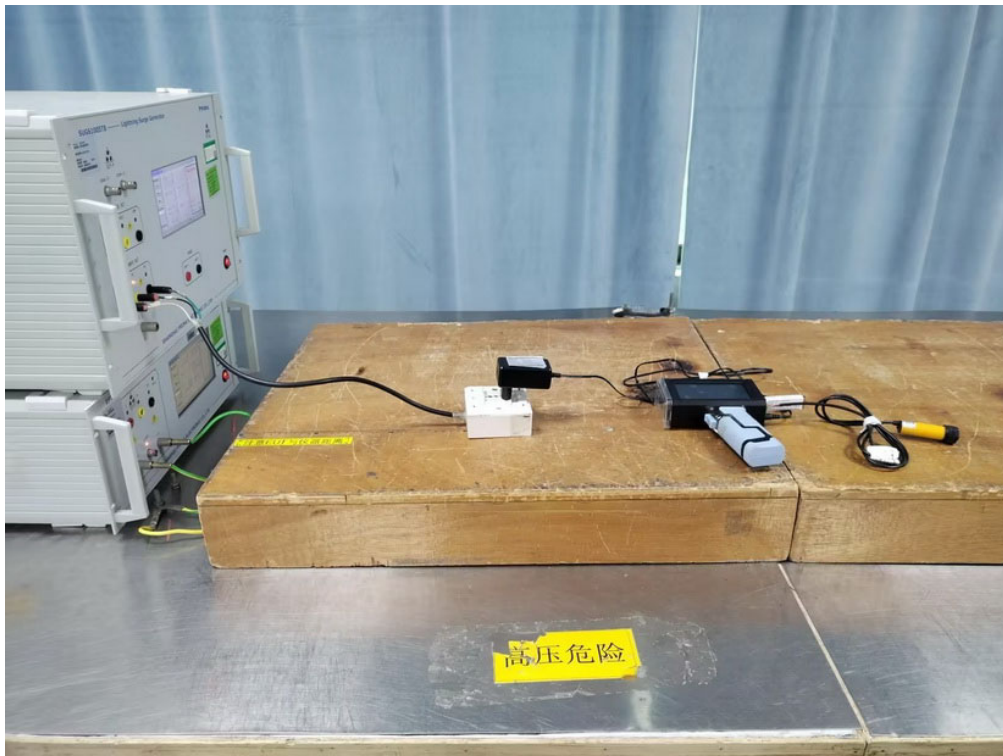
Radiated, radio-frequency, electromagnetic field immunity – Above 1GHz



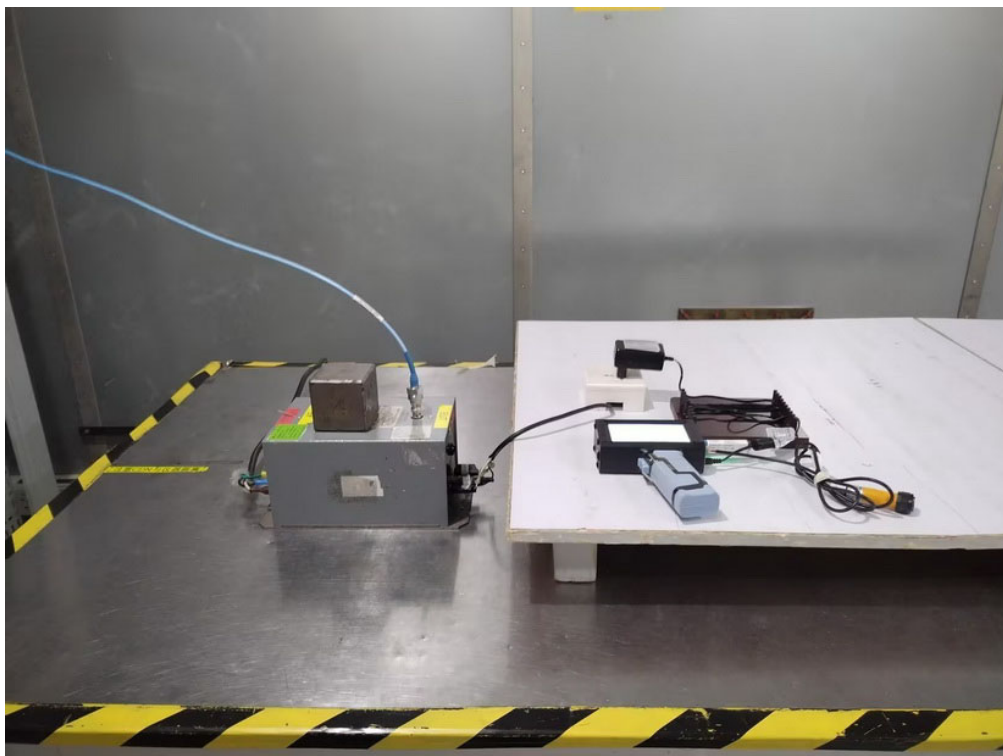
Electrical fast transient/burst immunity - AC



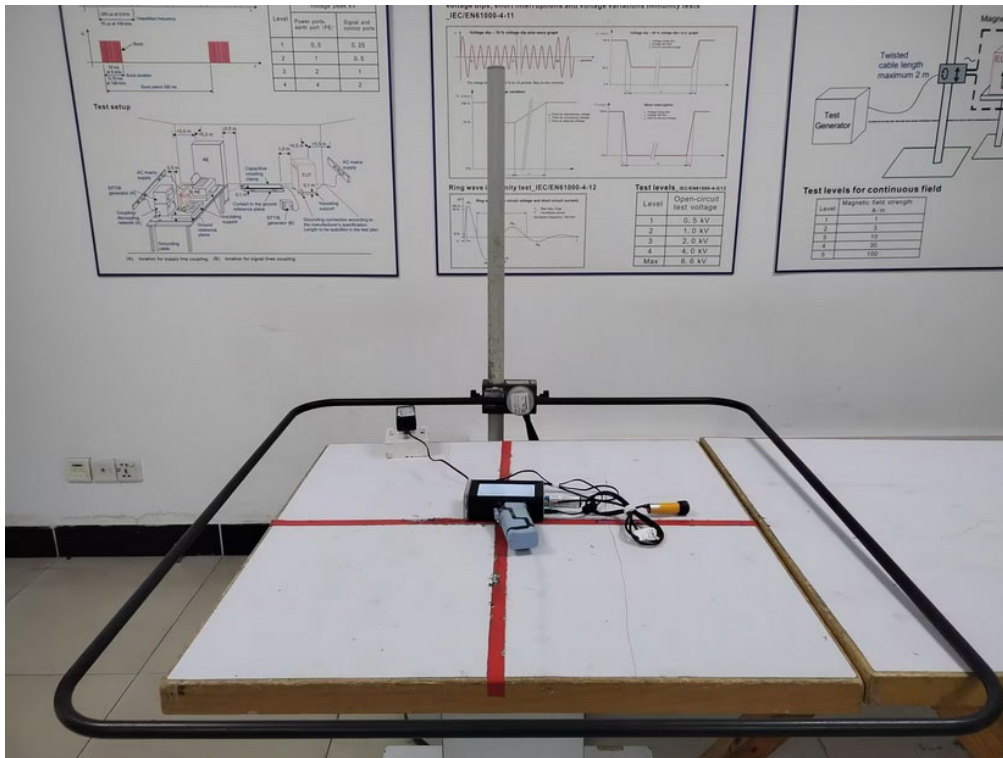
Surge immunity - AC



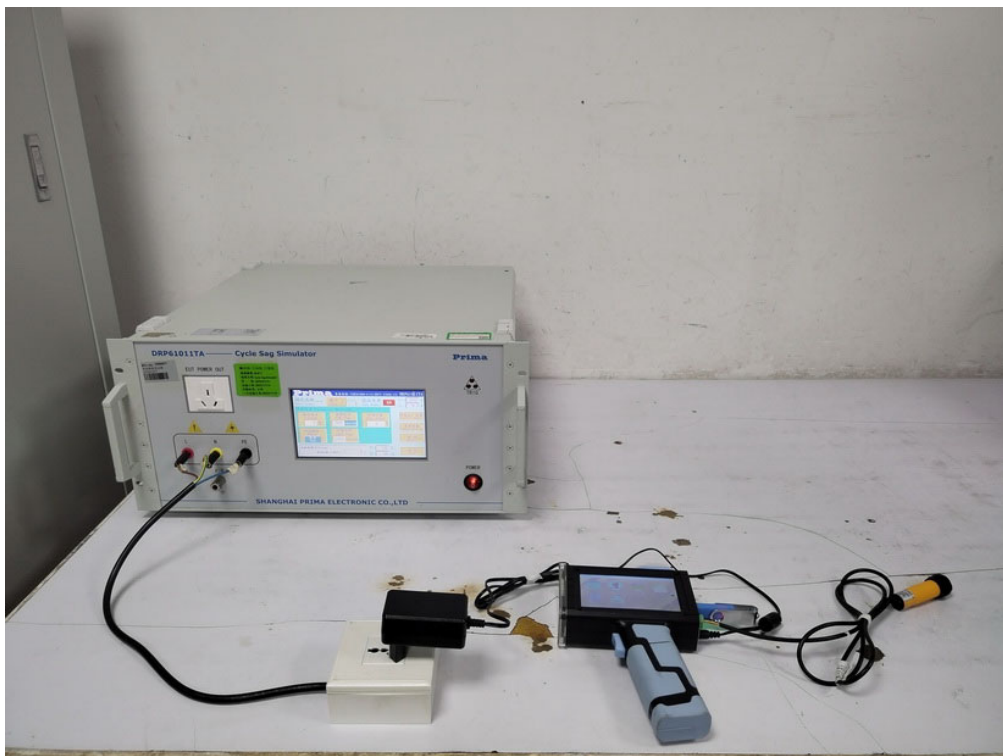
Immunity to conducted disturbances, induced by radio-frequency fields - AC



Power frequency magnetic field immunity



Voltage dips, short interruptions and voltage variations immunity



End of Test Report