CE EMC Test Report

Report No.	:	BTL-EMC-1-2605T132
Equipment	:	APM-EMA: Multi-Circuit Power Meter (DIN rail) APM-MAA: Current Input Module (Optional)
Model Name	:	APM-EMA, APM-MAA
Brand Name	:	ADTEK
Applicant	:	ADTEK ELECTRONICS CO., LTD.
Address	:	5F., No. 14, Lane 609, Sec. 5, Chongxin Rd., Sanchong Dist., New Taipei City 24159, Taiwan

Standard(s)	:	EN 55032:2015+A1:2020 Class A	BS EN 55032:2015+A1:2020 Class A
		EN IEC 61000-6-4:2019	BS EN IEC 61000-6-4:2019
		EN 55011:2016+A2:2021 Class A Group 1	BS EN 55011:2016+A2:2021 Class A Group 1
		CISPR 11:2015+AMD1:2016 +AMD2:2019 Ed. 6.2 Class A Group 1	
		EN IEC 61000-3-2:2019+A2:2024	BS EN IEC 61000-3-2:2019+ A2:2024
		EN 61000-3-3:2013+A2:2021/AC: 2022-01	BS EN 61000-3-3:2013+A2:2021
		EN IEC 61000-6-2:2019	BS EN IEC 61000-6-2:2019
		EN 55035:2017+A11:2020	BS EN 55035:2017+A11:2020
		EN 61000-4-2:2009	BS EN 61000-4-2:2009
		EN IEC 61000-4-3:2020	BS EN IEC 61000-4-3:2020
		EN 61000-4-4:2012	BS EN 61000-4-4:2012
		EN 61000-4-5:2014+A1:2017	BS EN 61000-4-5:2014+A1:2017
		EN IEC 61000-4-6:2023	BS EN IEC 61000-4-6:2023
		EN 61000-4-8:2010	BS EN 61000-4-8:2010
		EN IEC 61000-4-11:2020+AC:2022-10	BS EN IEC 61000-4-11:2020

Date of Receipt	:	2026/5/26
Date of Test	:	2026/7/7~2026/7/9
Issued Date	:	2026/8/4

The above equipment has been tested and found in compliance with the requirement of the above standards by BTL Inc.

Prepared by : Ray Chen, Engineer

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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 assumes no responsibility for the data provided by the Customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

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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.

REVISION HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-EMC-1-2605T132	R00	Original Report.	2026/8/4	Valid

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1 SUMMARY OF TEST RESULTS

Emission			
Standard	Test Item	Limit	Judgment
EN 55032:2015+A1:2020 BS EN 55032:2015+A1:2020	Radiated emissions up to 1 GHz	Class A	PASS
	Radiated emissions above 1 GHz	------	N/A
	Radiated emissions from FM receivers	------	N/A
	Outdoor units of home satellite receiving systems	------	N/A
	Conducted emissions from the AC mains power ports	Class A	PASS
	Asymmetric mode conducted emissions	------	N/A
	Conducted differential voltage emissions	------	N/A

Emission				
Standard	Test Item	Frequency range	Limit	Judgment
EN 55011:2016+A2:2021 Group 1 BS EN 55011:2016+A2:2021 Group 1 CISPR 11:2015+AMD1:2016 +AMD2:2019 Ed. 6.2 Group 1	Conducted disturbances	9 kHz to 150 kHz	Limits are not specified.	N/A
		150 kHz to 30 MHz (Disturbance voltage at low voltage a.c. mains power ports)	Class A	PASS
		150 kHz to 30 MHz (Conducted disturbances at low voltage d.c. power ports)	------	N/A
	Electromagnetic radiation disturbance	9 kHz to 150 kHz	Limits are not specified.	N/A
		150 kHz to 30 MHz	Limits are not specified.	N/A
		30 MHz to 1 GHz	Class A	PASS
		1 GHz to 18 GHz	Limits are not specified.	N/A
		18 GHz to 400 GHz	Limits are not specified.	N/A

Standard	Test Item	Limit	Judgment
EN IEC 61000-3-2:2019+A2:2024 BS EN IEC 61000-3-2:2019+ A2:2024	Harmonic current emissions	Class A	PASS
EN 61000-3-3:2013+A2:2021/AC: 2022-01 BS EN 61000-3-3:2013+A2:2021	Voltage changes, voltage fluctuations and flicker	$P_{st} \leq 1.0$ $d_c \leq 3.3$ % $P_{lt} \leq 0.65$ $d_{max} \leq 4$ % $T_{max} \leq 500$ ms	PASS

Emission			
Standard	Test Item		Judgment
EN IEC 61000-6-4:2019 BS EN IEC 61000-6-4:2019	Enclosure port	30 MHz to 230 MHz 230 MHz to 1 000 MHz	PASS
		1 GHz to 3 GHz 3 GHz to 6 GHz	N/A
	Low voltage AC mains port	0,15 MHz to 0,5 MHz 0,5 MHz to 30 MHz	PASS
	Wired network port	0,15 MHz to 0,5 MHz 0,5 MHz to 30 MHz	N/A
	DC power port NOTE (2)	0,15 MHz to 0,5 MHz 0,5 MHz to 30 MHz	N/A

Immunity					
Standard	Reference Standard / Clause	Environmental phenomenon	Performance Criterion Limit	Test Level	Judgment
EN 55035:2017 +A11:2020 BS EN 55035:2017 +A11:2020	EN 61000-4-2:2009	Electrostatic discharge	B	Air: Level 3 Contact: Level 2	PASS
	EN IEC 61000-4-3:2020	Continuous RF electromagnetic field disturbances	A	Level 2	PASS
	EN 61000-4-4:2012	Electrical fast transients / burst	B	AC Power Port: Level 2	PASS
	EN 61000-4-5:2014 +A1:2017	Surges	NOTE (3)	AC Power Port: Level 3	PASS
	EN IEC 61000-4-6:2023	Continuous induced RF disturbances	A	AC Power Port: Level 2	PASS
	EN 61000-4-8:2010	Power frequency magnetic field	A	Level 1	PASS
	EN IEC 61000-4-11:2020+AC:2022-10	Voltage dips and Voltage interruptions	NOTE (4)	NOTE (4)	PASS
	4.2.7	Broadband impulse noise disturbances, repetitive	A	------	N/A
	4.2.7	Broadband impulse noise disturbances, isolated	B	------	N/A

Immunity					
Standard	Reference Standard	Environmental phenomenon	Performance Criterion Limit	Test Level	Judgment
EN IEC 61000-6-2:2019 BS EN IEC 61000-6-2:2019	EN 61000-4-2:2009	Electrostatic discharge	B	Air: Level 3 Contact: Level 2	PASS
	EN IEC 61000-4-3:2020	Radio-frequency electromagnetic field. Amplitude modulated	A	80 to 1000 MHz: Level 3 1.4 to 6.0 GHz: Level 2	PASS
	EN 61000-4-4:2012	Fast transients	B	AC Power Port: Level 3	PASS
	EN 61000-4-5:2014 +A1:2017	Surges	B	AC Power Port: Level 3	PASS
	EN IEC 61000-4-6:2023	Radio-frequency common mode	A	AC Power Port: Level 3	PASS
	EN 61000-4-8:2010	Power-frequency magnetic field	A	Level 4	PASS
	EN IEC 61000-4-11:2020+AC:2022-10	Voltage dips and Voltage interruptions	NOTE (5)	NOTE (5)	PASS

Statement of Conformity
The statement of conformity is based on the binary decision rule according to IEC Guide 115 and ILAC G8 "simple acceptance" principle. Without considering measurement uncertainty, its specific risk is less than 50% PFA. (PFA: Probability of False Accept)

NOTE:
(1) ”N/A” denotes test is not applicable in this Test Report.
(2) Information purposes only.
(3) For DC network and AC mains power ports, the performance criterion is Criterion B.
For analogue/digital data ports:
Port type: unshielded symmetrical the performance criterion is Criterion C.
Port type: coaxial or shielded the performance criterion is Criterion B.
(4) For voltage dips residual voltage < 5 % the performance criterion is Criterion B.
For voltage dips residual voltage 70 % the performance criterion is Criterion C.
For voltage interruptions residual voltage < 5 % the performance criterion is Criterion C.
(5) For voltage dips residual 0 % the performance criterion is Criterion B.
For voltage dips residual 40 % the performance criterion is Criterion C.
For voltage dips residual 70 % the performance criterion is Criterion C.
For voltage interruptions residual 0 % the performance criterion is Criterion C.
(6) Both of specific and the latest version of the basic standard are referenced to fulfill the requirements.
(7) The report format version is TP.1.1.1.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

1F,2F, No.91, Ln. 298, Wengong 1st Rd., Guishan Dist., Taoyuan City, Taiwan

☒ C01 ☒ CB02 ☒ CB03
☒ SR02 ☒ SR03 ☒ SR04 ☒ SR05

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± 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 %**. The measurement instrumentation uncertainty is in accordance with CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

A. Radiated emissions up to 1 GHz/Enclosure port (Below 1 GHz) / Electromagnetic radiation disturbance test:

Test Site	Method	Measurement Frequency Range	U (dB)	U_{cispr} (dB)
CB03	CISPR	30 MHz ~ 1000 MHz	5.8	6.3

B. Conducted emissions from the AC mains power ports / Low voltage AC mains port / DC power port test / Conducted disturbances test:

Test Site	Method	Measurement Frequency Range	U (dB)	U_{cispr} (dB)
C01	CISPR	9 kHz ~ 150 kHz	3.5	3.8
		150 kHz ~ 30 MHz	3.0	3.4

C. Harmonic current emissions and Voltage changes, voltage fluctuations and flicker test:

Test Site	Method	U (%)
SR02	EN IEC 61000-3-2	1.6
	EN 61000-3-3	8.1

D. Immunity tests:

Test Site	Method	Test Item	U
SR05 (E-1528)	IEC/EN 61000-4-2 ESD	Peak current Ip1	≦ 3.0 %
		Peak current Ip2	≦ 3.2 %
		Rise time tr	≦ 13.1 %
		Current at 30 ns	≦ 3.3 %
		Current at 60 ns	≦ 3.3 %
CB02	IEC/EN 61000-4-3 RS	Level setting process	3.8 dB
		Test process	4.3 dB
SR03	IEC/EN 61000-4-4 EFT	Voltage peak value (VP)	3.5 %
		Voltage rise time (tr)	7.9 %
		Voltage pulse width (tw)	1.9 %
SR03	IEC/EN 61000-4-5 SURGE	Voltage peak value (VP)	4.1 %
		Voltage front time (Tf)	9.1 %
		Voltage duration (td)	2.7 %
SR04	IEC/EN 61000-4-6 CS	Level setting process	1.6 dB
		CDN test process	0.6 dB
		EM clamp level setting process	3.0 dB
SR02	IEC/EN 61000-4-8 PFMF	PFMF mG Calibration	10.3 %
SR02	IEC/EN 61000-4-11 DIPS	DIP Calibration	4.5 %

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	Environment Condition	Tested by
Conducted emissions from the AC mains power ports	27°C, 40%	Rui Huang
Radiated emissions up to 1 GHz	23°C, 61%	Rui Huang
Harmonic current emissions	23°C, 43%	Rui Huang
Voltage changes, voltage fluctuations and flicker	23°C, 43%	Rui Huang
Electrostatic discharge	26°C, 58%, 1004hPa	Ray Chen
Continuous RF electromagnetic field disturbances	23°C, 48%	Rui Huang
Electrical fast transients / burst	26°C, 46%	Ray Chen
Surges	26°C, 46%	Ray Chen
Continuous induced RF disturbances	23°C, 54%	Ray Chen
Power frequency magnetic field	24°C, 40%	Rui Huang
Voltage dips and Voltage interruptions	27°C, 43%	Ray Chen

2 GENERAL INFORMATION

2.1 EUT INFORMATION

Equipment	APM-EMA: Multi-Circuit Power Meter (DIN rail) APM-MAA: Current Input Module (Optional)
Model Name	APM-EMA, APM-MAA
Brand Name	ADTEK
Model Difference	APM-EMA LED Board IPV Main Board (600Vac 3P Voltage Input & RS485) MCU: STM32H562VGT6 IPV Power Board (DC 12~48V (±10%)) IPA LED Board IPA Main Board (333m Vac (from CT) Input*6 (RJ11)) MCU: STM32H562VGT6 IPA Power Board (DC 12~48V (±10%)) APM-MAA IPA LED Board IPA Main Board (333m Vac (from CT) Input*6 (RJ11)) MCU: STM32H562VGT6 IPA Power Board (DC 12~48V (±10%))
Power Source	AC Mains
Power Rating	DC 12~48V (±10%); (APM-EMA<2.5W, APM-MAA<1.5W) INPUT:600Vac,1P/3P(Prog)*1ch,333mVac,45~65Hz*3Φ-6ch
Adapter Rating	MEAN WELL / MDR-20-24 INPUT: 100-240VAC 0.55A 50/60Hz OUTPUT: 24VDC 1.0A
Products Covered	N/A
Test Model	APM-EMA, APM-MAA
Sample Status	Engineering Sample
Highest Internal Frequency	84 MHz
EUT Modification(s)	N/A

NOTE:
(1) The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.2 TEST MODES

The test system was pre-tested considering all possible combinations of EUT operation modes according to test plan.

Pretest Mode	Description
Mode 1	Normal Operation (APM-EMA)
Mode 2	Normal Operation (APM-MAA)

The following modes were found to be the worst cases and selected for the final test.

Radiated emissions up to 1 GHz / Enclosure port (Below 1 GHz) / Electromagnetic radiation disturbance test	
Final Test Mode	Description
Mode 1	Normal Operation (APM-EMA)

Conducted emissions from the AC mains power ports / Low voltage AC mains port / DC power port test / Conducted disturbances test	
Final Test Mode	Description
Mode 1	Normal Operation (APM-EMA)

Final Test Mode	Harmonic current emissions & Voltage changes, voltage fluctuations and flicker test
	Description
Mode 1	Normal Operation (APM-EMA)

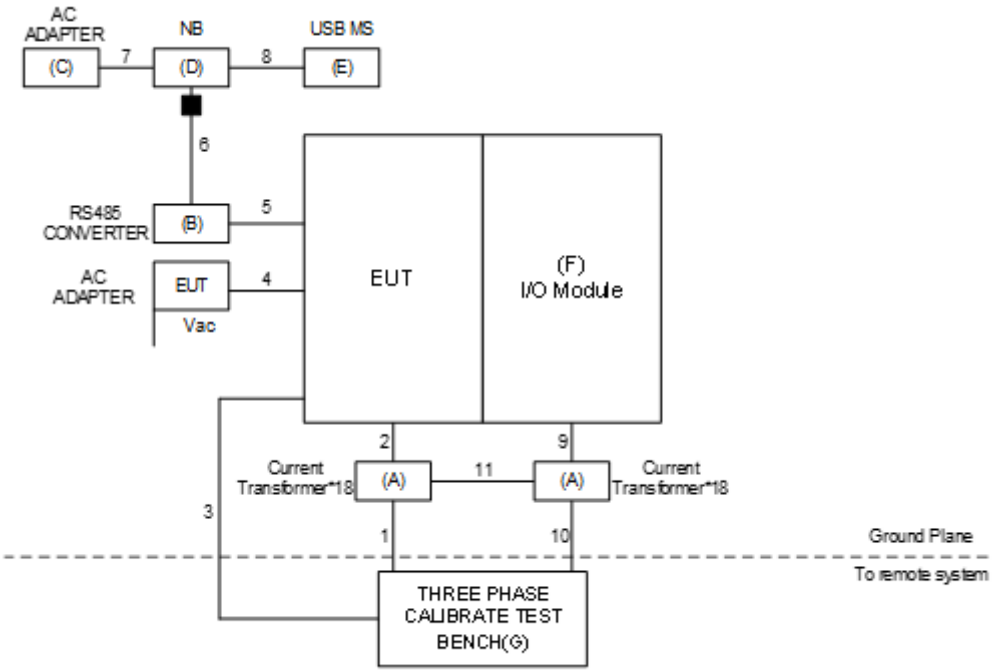
Immunity tests	
Final Test Mode	Description
Mode 1	Normal Operation (APM-EMA)

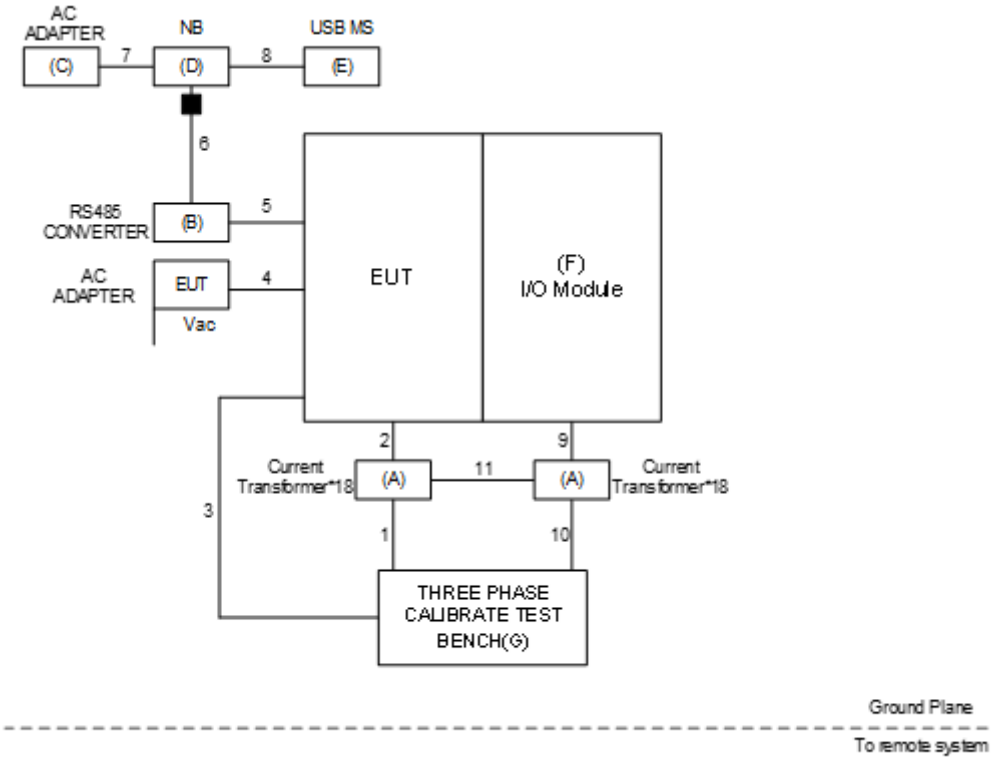
2.3 EUT OPERATING CONDITION

The EUT exercise program (APM-SW-V15_20260304) used during radiated and/or conducted emissions measurement was designed to exercise the various system components in a manner similar to a typical use.

2.4 TESTED CONFIGURATION DIAGRAM

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.5.





2.5 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
A	Current Transformer	ADTEK	US-CTQ-10-005	1250922957B3	Supplied by test requester
B	RS485 CONVERTER	ADTEK	PL-STU-11	N/A	Supplied by test requester
C	AC ADAPTER	LENOVO	ADLX65YLC3D	N/A	Furnished by test lab.
D	Notebook PC	Lenovo	21C2SA2100	PW06AD9E	Furnished by test lab.
E	USB Mouse	DELL	MS116p	N/A	Furnished by test lab.
F	I/O Module	ADTEK	APM-MAA	N/A	Supplied by test requester
G	THREE PHASE CALIBRATE TEST BENCH	KAIPU	KP-P3001-C	N/A	Supplied by test requester

Item	Cable Type	Shielded	Ferrite Core	Length	Remarks
1	POWER CABLE*3	NO	NO	3m	Furnished by test lab.
2	RJ12 CABLE*6	YES	NO	2m	Supplied by test requester
3	POWER CABLE*4	NO	NO	3m	Furnished by test lab.
4	POWER CABLE	NO	NO	1.2m	Furnished by test lab.
5	POWER CABLE	NO	NO	1m	Supplied by test requester
6	USB CABLE	YES	YES	1.8m	Supplied by test requester
7	TYPE C CABLE	YES	NO	1.2m	Furnished by test lab.
8	USB CABLE	YES	NO	1.7m	Furnished by test lab.
9	RJ12 CABLE*6	YES	NO	2m	Supplied by test requester
10	POWER CABLE*3	NO	NO	3m	Furnished by test lab.
11	POWER CABLE*3	NO	NO	1.6m	Furnished by test lab.

3 EMC EMISSION TEST - EN 55032

3.1 RADIATED EMISSIONS UP TO 1 GHZ TEST

3.1.1 LIMITS

Class A			
Frequency (MHz)	Distance (m)	Detector type / bandwidth	Limits (dBµV/m)
30 - 230	10	Quasi Peak / 120 kHz	40
230 - 1000			47
30 - 230	3		50
230 - 1000			57
Class B			
Frequency (MHz)	Distance (m)	Detector type / bandwidth	Limits (dBµV/m)
30 - 230	10	Quasi Peak / 120 kHz	30
230 - 1000			37
30 - 230	3		40
230 - 1000			47

FM Receiver				
Frequency (MHz)	Distance (m)	Detector type / bandwidth	Class B Limits (dBµV/m)	
			Fundamental	Harmonics
30 - 230	10	Quasi Peak / 120 kHz	50	42
230 - 300				42
300 - 1000				46
30 - 230	3		60	52
230 - 300				52
300 - 1000				56
These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator signals at all other frequencies shall be compliant with the limits given in Table A.4 of EN 55032.				

NOTE:
(1) The tighter limit applies at the band edges.
(2) Emission level (dBuV/m) = 20log Emission level (uV/m).
(3) 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
Calculation example:

Reading Level (dBµV)		Correct Factor (dB/m)		Measurement Value (dBµV/m)		Limit Value (dBµV/m)		Margin Level (dB)
19.11	+	2.11	=	21.22	-	40	=	-18.78

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9168	01578	2025/7/31	2026/7/30
2	Attenuator	INMET	EMCI-N-6-05	AT-N0576	2025/7/31	2026/7/30
3	Pre-Amplifier	EMCI	EMC001330	980908	2025/7/22	2026/7/21
4	Test Cable	EMCI	EMC104-SM-SM-6000	230539	2025/7/22	2026/7/21
5	Test Cable	EMCI	EMC104-SM-SM-2500	230542	2025/7/22	2026/7/21
6	Test Cable	EMCI	EMC104-SM-SN-1000	230543	2025/7/22	2026/7/21
7	EXA Signal Analyzer	Keysight	N9010A	MY52220990	2025/10/1	2026/9/30
8	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

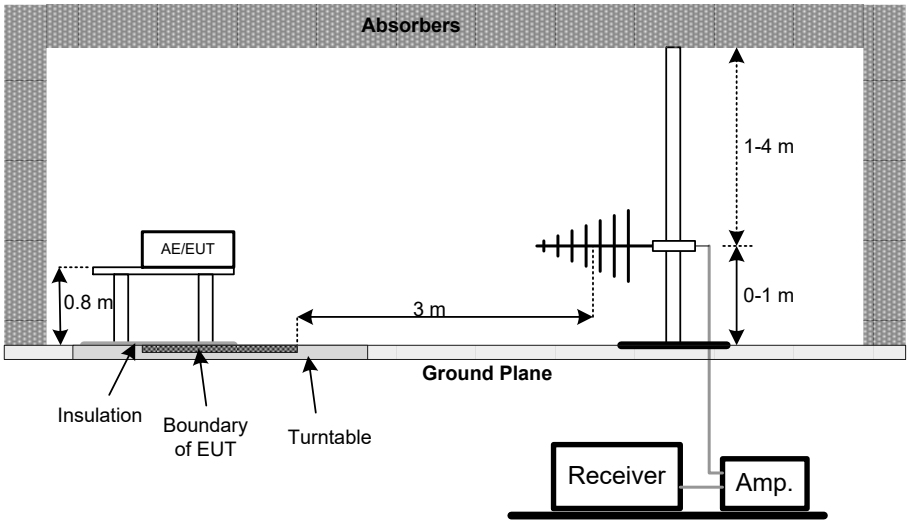
3.1.3 TEST PROCEDURE

a. The separation distance of 3 m was used for measurements below 1 GHz.
The EUT was placed on the top of a table 0.8 m above the rotating ground in a 3 m semi-anechoic chamber.
b. Cables connecting to AE located outside the measurement area drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer’s recommendation.
c. The rotating ground was rotated 360 degrees to determine the position of the highest radiation.
d. The height of the receive antenna was varied between 1 m and 4 m. Both horizontal and vertical polarizations of the antenna were checked.
e. For each suspected emission, the EUT was arranged at its worst case and then the antenna was scanned in height to find the maximum.
f. The receiver was set to quasi-peak detect function and specified bandwidth with maximum hold mode.
g. For the actual test configuration, please refer to the related Item -TEST PHOTOS.

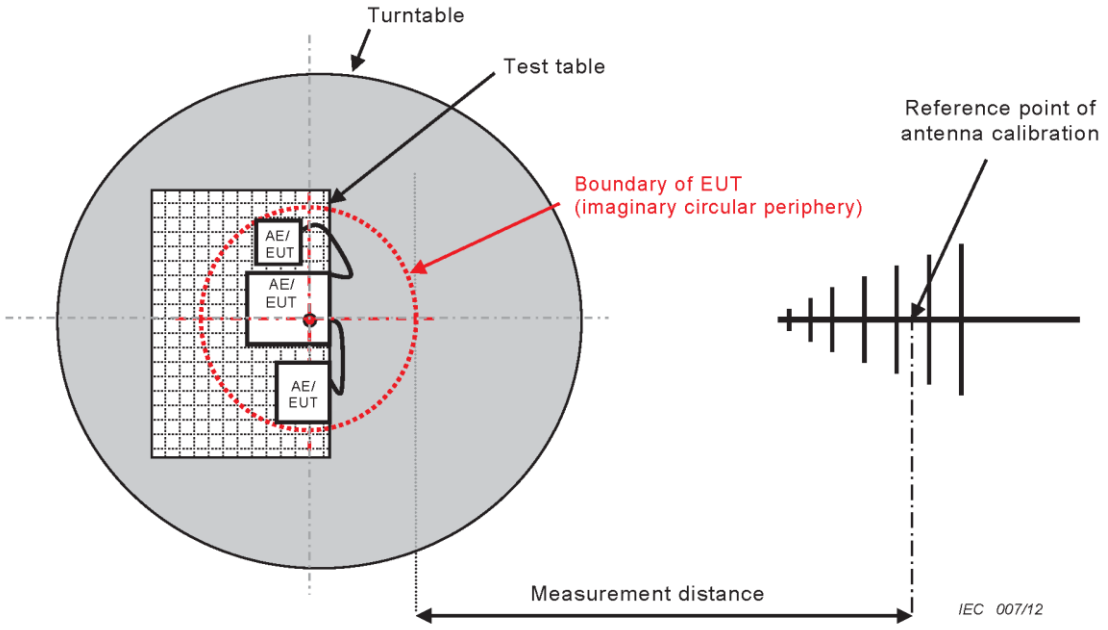
3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

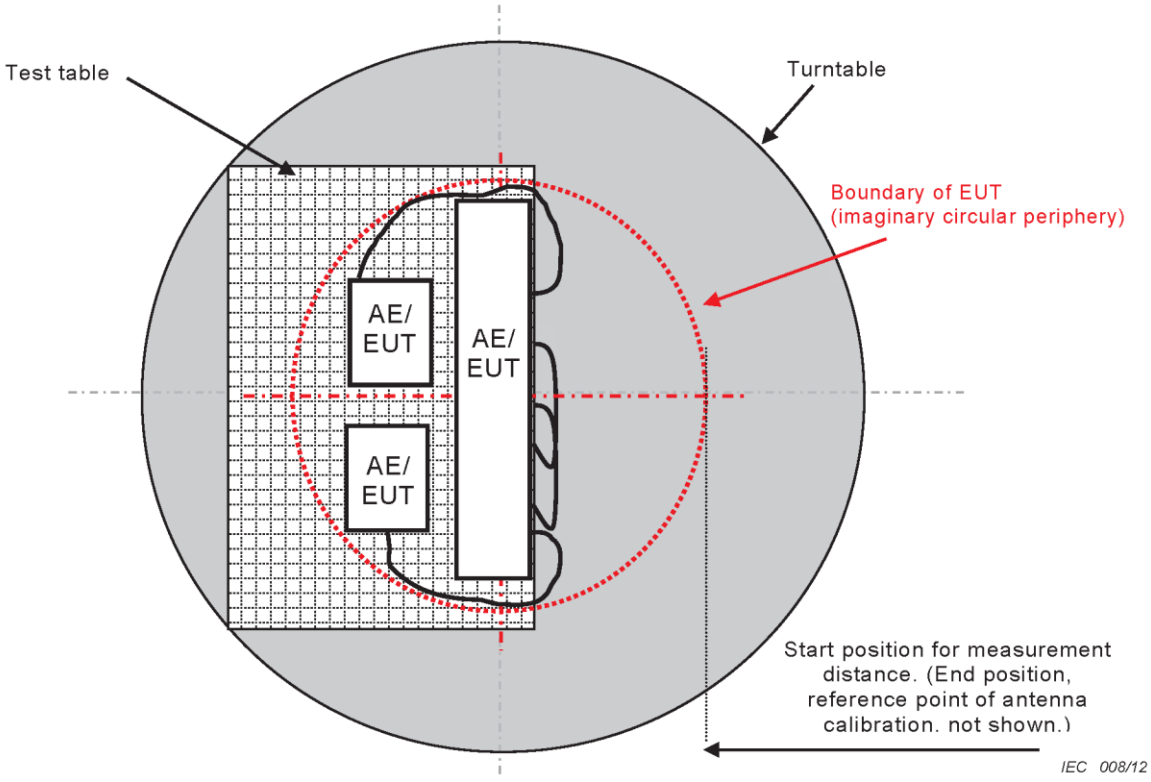
3.1.5 TEST SETUP



3.1.6 MEASUREMENT DISTANCE



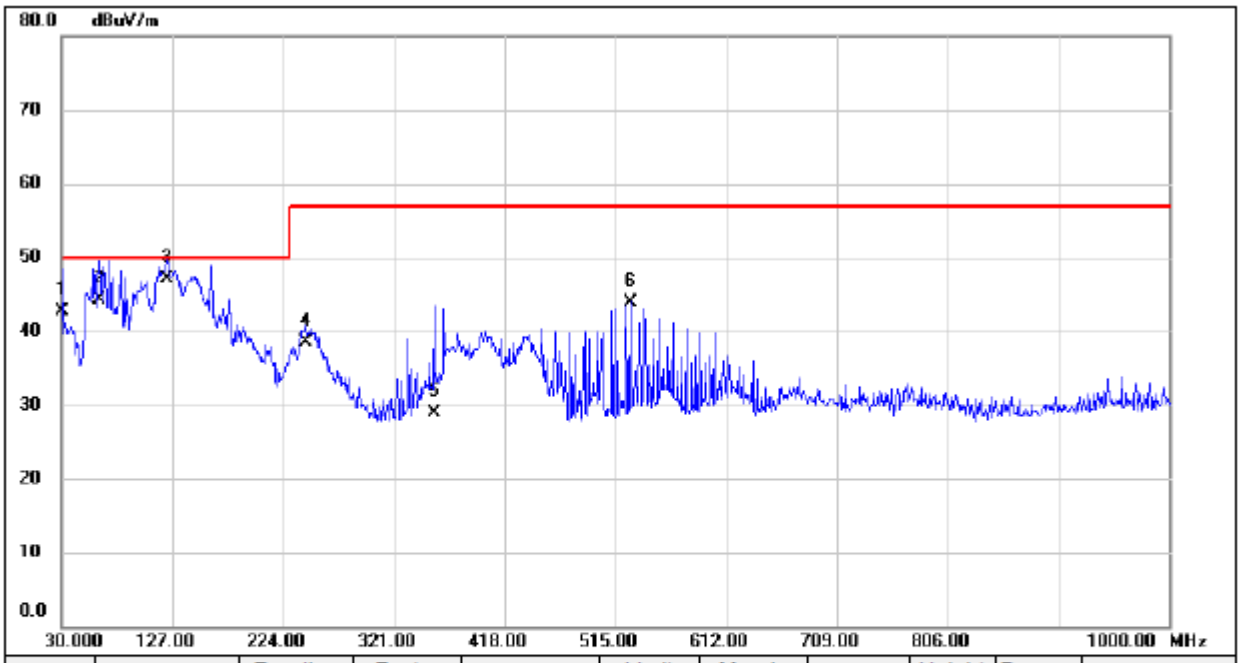
Measurement distance



Boundary of EUT, Local AE and associated cabling

3.1.7 TEST RESULT

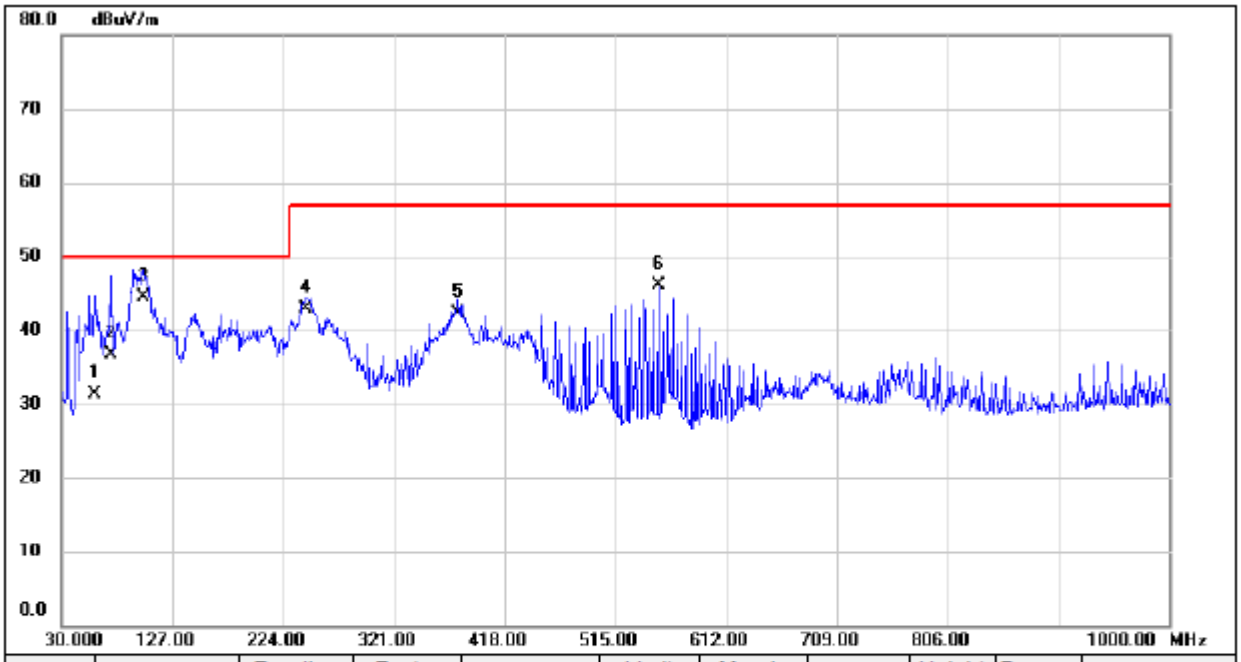
Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Vertical



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		30.9700	56.17	-13.52	42.65	50.00	-7.35	QP	100	165	
2		62.9800	57.53	-13.23	44.30	50.00	-5.70	QP	100	181	
3	*	122.1500	61.50	-14.49	47.01	50.00	-2.99	QP	100	205	
4		243.4000	51.98	-13.52	38.46	57.00	-18.54	QP	100	86	
5		355.9200	38.78	-9.84	28.94	57.00	-28.06	QP	100	205	
6		528.5800	49.96	-6.07	43.89	57.00	-13.11	QP	100	161	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Horizontal



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		59.1000	43.77	-12.56	31.21	50.00	-18.79	QP	100	273	
2		72.6800	51.84	-15.22	36.62	50.00	-13.38	QP	100	233	
3	*	101.7800	61.15	-16.67	44.48	50.00	-5.52	QP	200	317	
4		243.4000	56.46	-13.52	42.94	57.00	-14.06	QP	100	301	
5		377.2600	51.59	-9.22	42.37	57.00	-14.63	QP	100	233	
6		552.8300	51.65	-5.61	46.04	57.00	-10.96	QP	100	65	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

3.2 CONDUCTED EMISSIONS MEASUREMENT AT AC MAINS POWER PORTS TEST

3.2.1 LIMITS

Class A			
Frequency (MHz)	Coupling device	Detector type / bandwidth	Limits (dBµV)
0.15 – 0.5	AMN	Quasi Peak / 9 kHz	79
0.5 - 30			73
0.15 – 0.5		Average / 9 kHz	66
0.5 - 30			60
Class B			
Frequency (MHz)	Coupling device	Detector type / bandwidth	Limits (dBµV)
0.15 – 0.5	AMN	Quasi Peak / 9 kHz	66 - 56
0.5 – 5			56
5 – 30			60
0.15 – 0.5		Average / 9 kHz	56 - 46
0.5 – 5			46
5 – 30			50

NOTE:
(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
(3) 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
Calculation example:

Reading Level (dBµV)		Correct Factor (dB)		Measurement Value (dBµV/m)		Limit Value (dBµV/m)		Margin Level (dB)
38.22	+	3.45	=	41.67	-	60	=	-18.33

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Test Cable	EMCI	EMCRG142S-SM-SM-5000	230609	2025/8/8	2026/8/7
2	EMI Test Receiver	R&S	ESR3	103133	2025/9/3	2026/9/2
3	LISN	Schwarzbeck	NNLK 8129	00664	2026/3/18	2027/3/17
4	Pulse Limiter	Schwarzbeck	VTSD 9561-F	01165	2025/9/24	2026/9/23
5	Measurement Software	Farad	EZ_EMC (Ver.E-LAB-5A2.2 2021)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

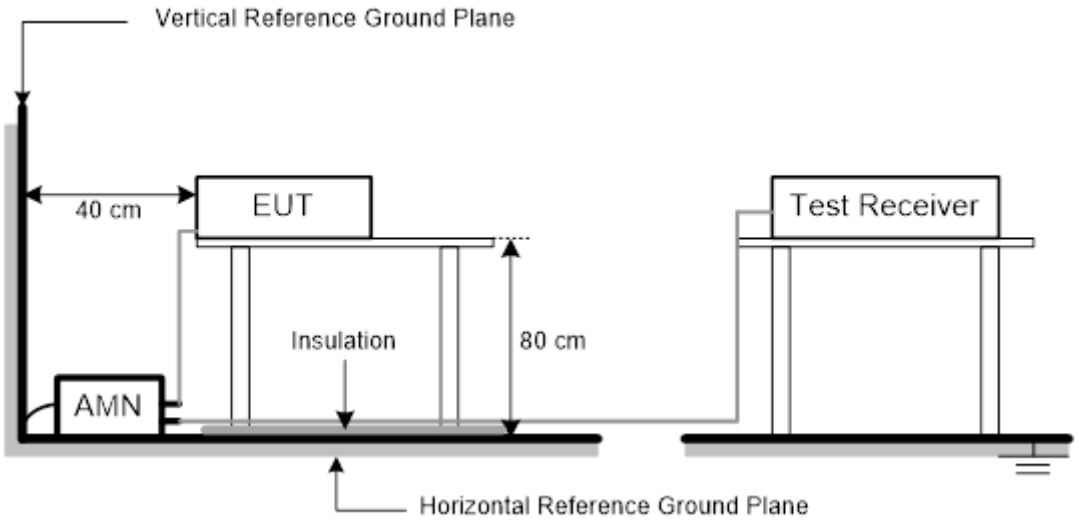
3.2.3 TEST PROCEDURE

a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through an AMN.
   All other support equipment were powered from an additional AMN.
   The AMN provides 50 Ohm/50uH of impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
c. Excess I/O cables that are not connected to a peripheral shall be bundled in the center.
   The end of the cable will be terminated, using the correct terminating impedance.
   The overall length shall not exceed 1 m.
d. Cables connecting to AE located outside the measurement area drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer’s recommendation.
e. The AMN is spaced at least 80 cm from the nearest part of the EUT chassis.
f. The receiver was set to quasi-peak and average detect function and specified bandwidth with maximum hold mode.
g. For the actual test configuration, please refer to the related Item -TEST PHOTOS.

3.2.4 DEVIATION FROM TEST STANDARD

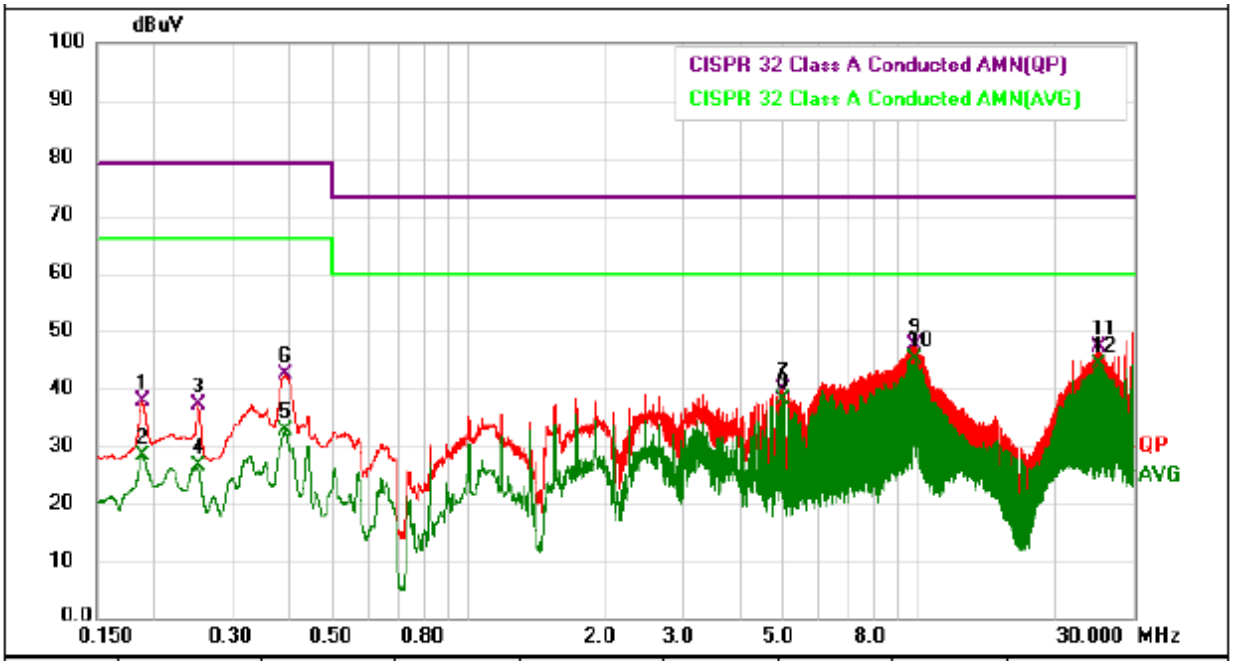
No deviation.

3.2.5 TEST SETUP



3.2.6 TEST RESULT

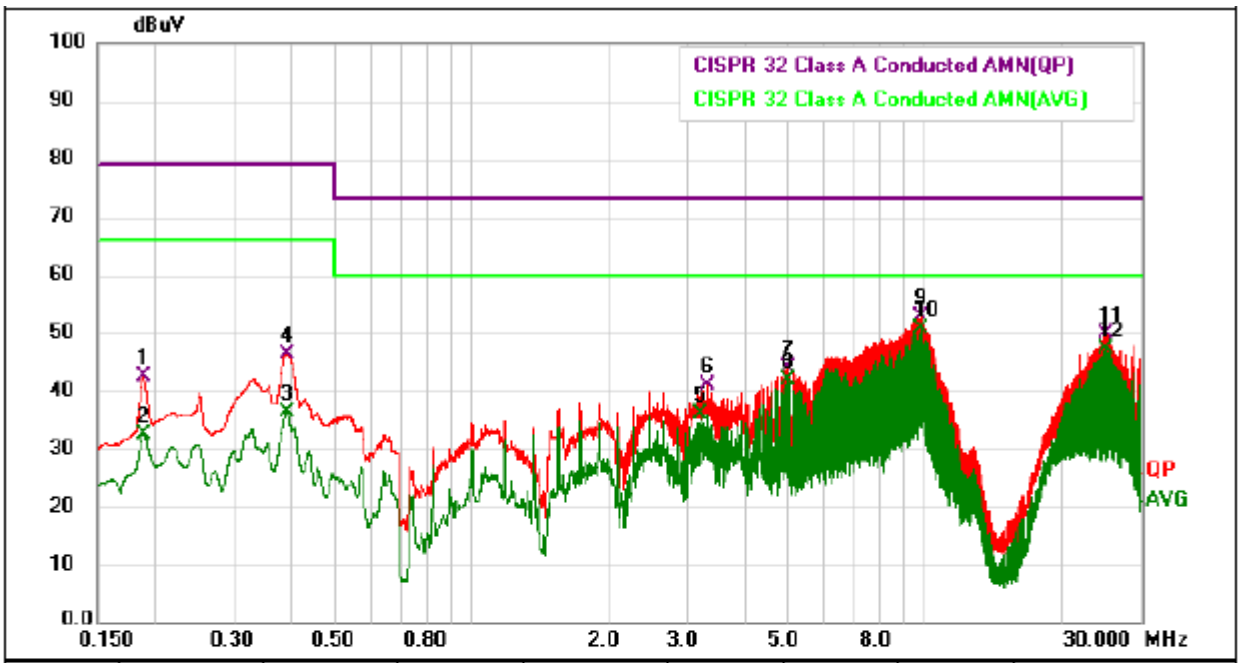
Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Line



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	27.72	10.10	37.82	79.00	-41.18	QP	
2		0.188250	18.41	10.10	28.51	66.00	-37.49	AVG	
3		0.251250	27.08	10.10	37.18	79.00	-41.82	QP	
4		0.251250	16.39	10.10	26.49	66.00	-39.51	AVG	
5		0.390750	22.53	10.15	32.68	66.00	-33.32	AVG	
6		0.393000	32.27	10.15	42.42	79.00	-36.58	QP	
7		4.989750	29.62	10.33	39.95	73.00	-33.05	QP	
8		4.989750	27.78	10.33	38.11	60.00	-21.89	AVG	
9		9.856500	37.16	10.42	47.58	73.00	-25.42	QP	
10	*	9.856500	34.86	10.42	45.28	60.00	-14.72	AVG	
11		25.010250	36.37	10.92	47.29	73.00	-25.71	QP	
12		25.010250	33.31	10.92	44.23	60.00	-15.77	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.
(3) *: Maximum data x: Over limit !: Over margin

Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Neutral



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	32.29	10.11	42.40	79.00	-36.60	QP	
2		0.188250	22.47	10.11	32.58	66.00	-33.42	AVG	
3		0.390750	26.19	10.16	36.35	66.00	-29.65	AVG	
4		0.393000	36.27	10.16	46.43	79.00	-32.57	QP	
5		3.194250	25.79	10.29	36.08	60.00	-23.92	AVG	
6		3.327000	30.72	10.29	41.01	73.00	-31.99	QP	
7		4.989750	33.69	10.32	44.01	73.00	-28.99	QP	
8		4.989750	31.58	10.32	41.90	60.00	-18.10	AVG	
9		9.795750	42.27	10.43	52.70	73.00	-20.30	QP	
10	*	9.795750	40.38	10.43	50.81	60.00	-9.19	AVG	
11		25.012500	39.01	10.93	49.94	73.00	-23.06	QP	
12		25.012500	36.19	10.93	47.12	60.00	-12.88	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.
(3) *: Maximum data x: Over limit !: Over margin

4 EMC EMISSION TEST - EN IEC 61000-6-4

4.1 ENCLOSURE PORT TEST (BELOW 1 GHZ)

4.1.1 LIMITS

Frequency (MHz)	Distance (m)	Detector type / bandwidth	Limits (dBμV/m)
30 - 230	10	Quasi Peak / 120 kHz	40
230 - 1000			47
30 - 230	3		50
230 - 1000			57

NOTE:
(1) The tighter limit applies at the band edges.
(2) Emission level (dBμV/m) = 20log Emission level (μV/m).
3 m Emission level = 10 m Emission level + 20log(10 m/3 m).
(3) 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
Calculation example:

Reading Level (dBμV)		Correct Factor (dB/m)		Measurement Value (dBμV/m)		Limit Value (dBμV/m)		Margin Level (dB)
19.11	+	2.11	=	21.22	-	40	=	-18.78

4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9168	01578	2025/7/31	2026/7/30
2	Attenuator	INMET	EMCI-N-6-05	AT-N0576	2025/7/31	2026/7/30
3	Pre-Amplifier	EMCI	EMC001330	980908	2025/7/22	2026/7/21
4	Test Cable	EMCI	EMC104-SM-SM-6000	230539	2025/7/22	2026/7/21
5	Test Cable	EMCI	EMC104-SM-SM-2500	230542	2025/7/22	2026/7/21
6	Test Cable	EMCI	EMC104-SM-SN-1000	230543	2025/7/22	2026/7/21
7	EXA Signal Analyzer	Keysight	N9010A	MY52220990	2025/10/1	2026/9/30
8	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

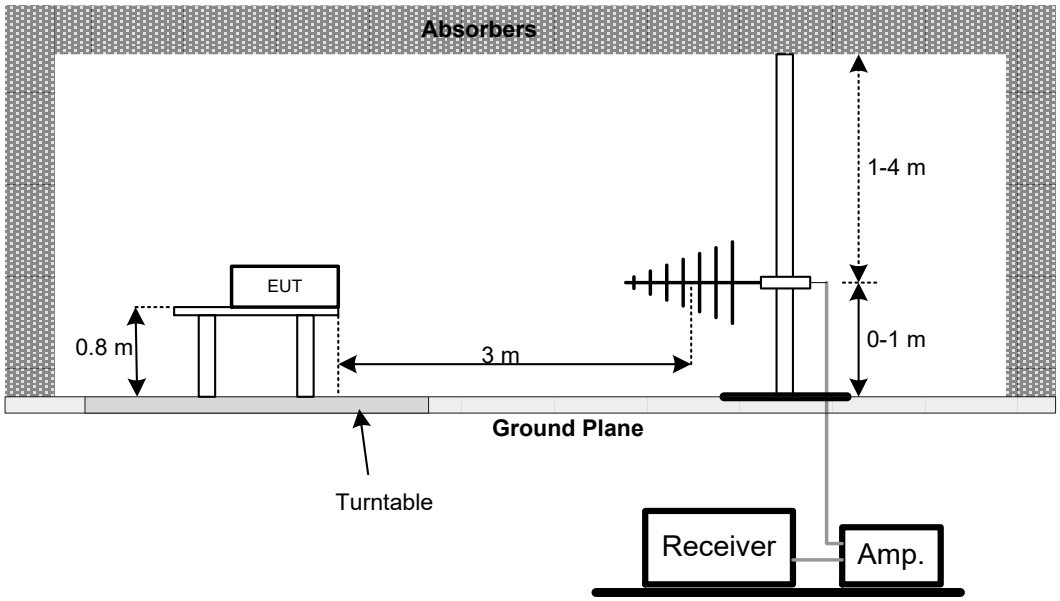
4.1.3 TEST PROCEDURE

a. The separation distance of 3 m was used for measurements below 1 GHz.
The EUT was placed on the top of a rotating table 0.8 m above the ground in a 3 m semi-anechoic chamber.
b. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the receive antenna was varied between 1 m and 4 m. Both horizontal and vertical polarizations of the antenna were checked.
d. For each suspected emission, the EUT was arranged at its worst case and then the antenna was scanned in height to find the maximum.
e. The EUT is scanned with the receiver using the peak detector.
Significant peaks are then marked and re-measured using the Quasi Peak detector.
f. All readings are Peak unless otherwise stated QP or AVG in the results. For compliance the QP reading must be less than the limit.
g. For the actual test configuration, please refer to the related Item -TEST PHOTOS.

4.1.4 DEVIATION FROM TEST STANDARD

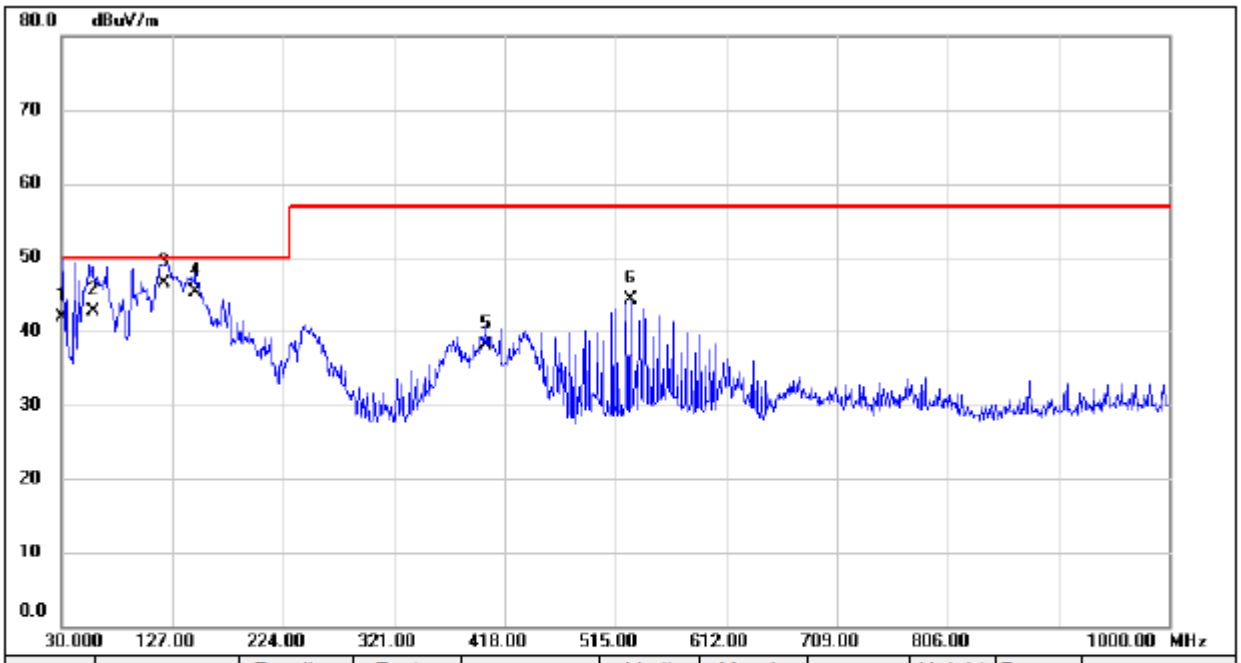
No deviation.

4.1.5 TEST SETUP



4.1.6 TEST RESULT

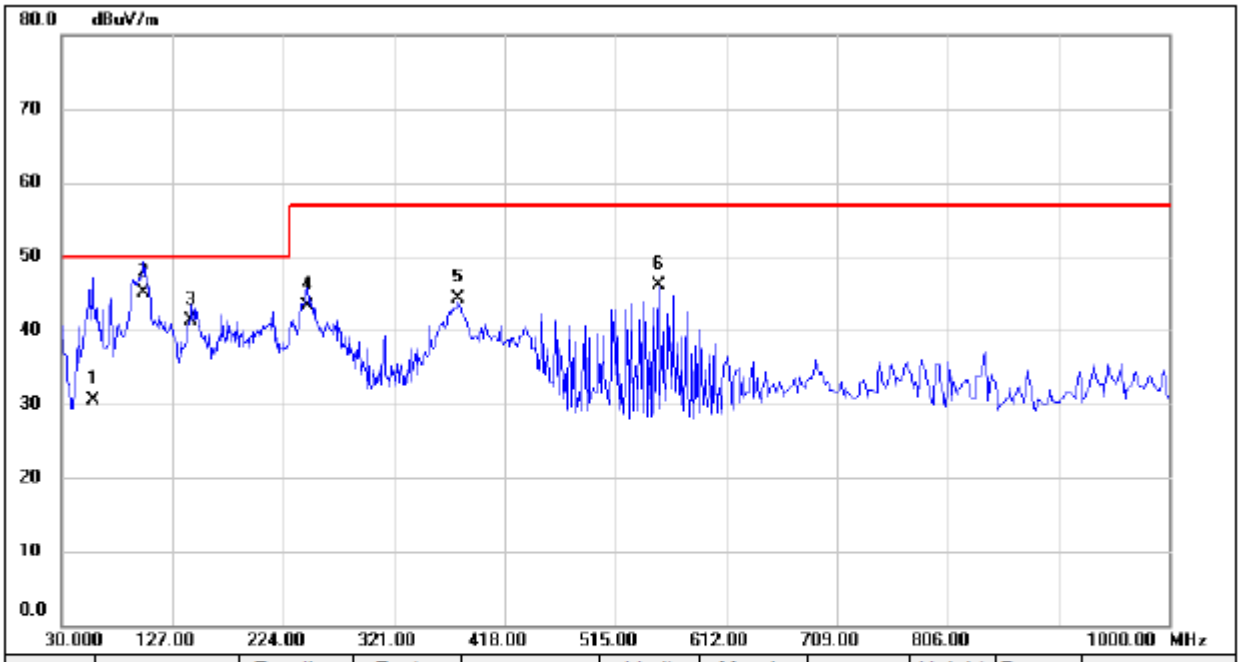
Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Vertical



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		30.0000	55.45	-13.58	41.87	50.00	-8.13	QP	100	111	
2		58.1300	55.20	-12.55	42.65	50.00	-7.35	QP	100	318	
3	*	119.2400	61.25	-14.80	46.45	50.00	-3.55	QP	100	214	
4		146.4000	57.56	-12.23	45.33	50.00	-4.67	QP	100	114	
5		401.5100	46.66	-8.52	38.14	57.00	-18.86	QP	100	162	
6		528.5800	50.38	-6.07	44.31	57.00	-12.69	QP	100	158	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Horizontal



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		57.1600	43.05	-12.51	30.54	50.00	-19.46	QP	100	212	
2	*	101.7800	61.68	-16.67	45.01	50.00	-4.99	QP	200	298	
3		143.4900	53.86	-12.50	41.36	50.00	-8.64	QP	200	127	
4		245.3400	56.65	-13.35	43.30	57.00	-13.70	QP	100	310	
5		377.2600	53.45	-9.22	44.23	57.00	-12.77	QP	100	231	
6		552.8300	51.64	-5.61	46.03	57.00	-10.97	QP	100	61	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

4.2 LOW VOLTAGE AC MAINS PORT TEST / DC POWER PORT TEST

4.2.1 LIMITS

Frequency (MHz)	Coupling device	Detector type / bandwidth	Limits (dBµV)
0.15 – 0.5	AMN	Quasi Peak / 9 kHz	79
0.5 - 30			73
0.15 – 0.5		Average / 9 kHz	66
0.5 - 30			60

NOTE:
(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
(3) 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
Calculation example:

Reading Level (dBµV)		Correct Factor (dB)		Measurement Value (dBµV/m)		Limit Value (dBµV/m)		Margin Level (dB)
38.22	+	3.45	=	41.67	-	60	=	-18.33

4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Test Cable	EMCI	EMCRG142S-SM-SM-5000	230609	2025/8/8	2026/8/7
2	EMI Test Receiver	R&S	ESR3	103133	2025/9/3	2026/9/2
3	LISN	Schwarzbeck	NNLK 8129	00664	2026/3/18	2027/3/17
4	Pulse Limiter	Schwarzbeck	VTSD 9561-F	01165	2025/9/24	2026/9/23
5	Measurement Software	Farad	EZ_EMC (Ver.E-LAB-5A2.2 2021)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

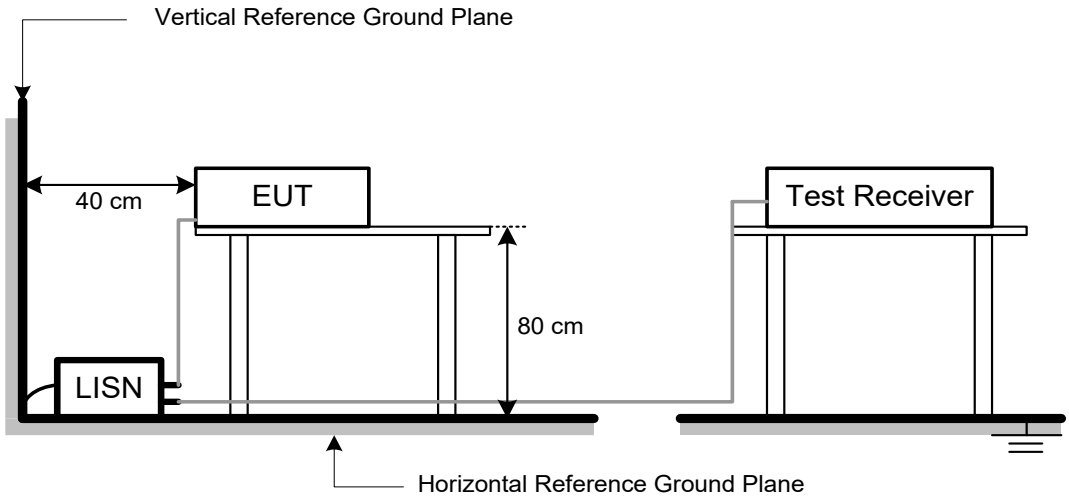
4.2.3 TEST PROCEDURE

a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through a line impedance stabilization network (LISN).
All other support equipment were powered from an additional LISN(s).
The LISN provides 50 Ohm/50uH of impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
c. Excess I/O cables that are not connected to a peripheral shall be bundled in the center.
The end of the cable will be terminated, using the correct terminating impedance.
The overall length shall not exceed 1 m.
d. The LISN is spaced at least 80 cm from the nearest part of the EUT chassis.
e. For the actual test configuration, please refer to the related Item -TEST PHOTOS.

4.2.4 DEVIATION FROM TEST STANDARD

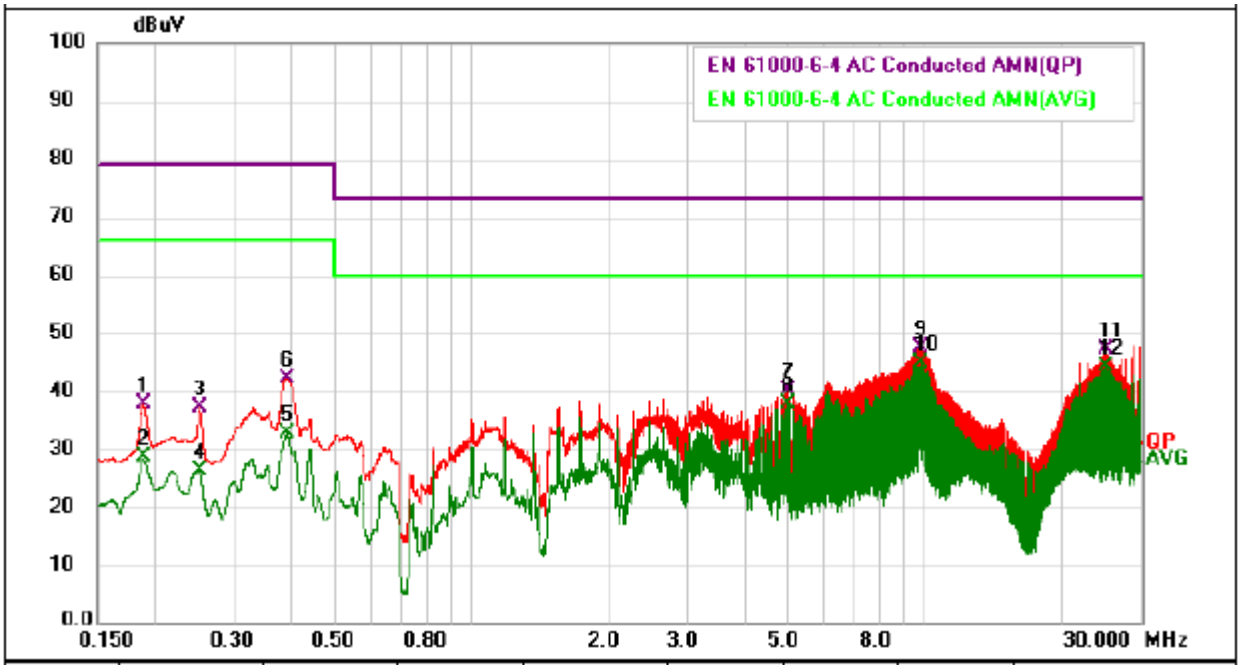
No deviation.

4.2.5 TEST SETUP



4.2.6 TEST RESULT

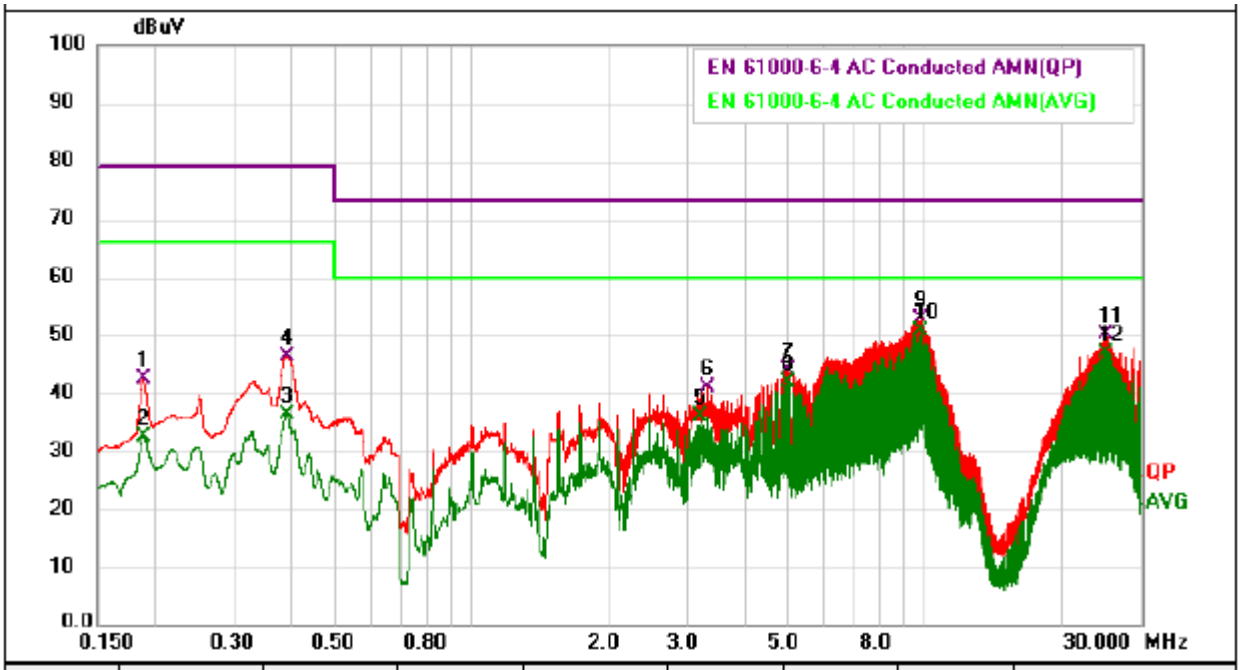
Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Line



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	27.77	10.10	37.87	79.00	-41.13	QP	
2		0.188250	18.43	10.10	28.53	66.00	-37.47	AVG	
3		0.251250	27.11	10.10	37.21	79.00	-41.79	QP	
4		0.251250	16.21	10.10	26.31	66.00	-39.69	AVG	
5		0.390750	22.63	10.15	32.78	66.00	-33.22	AVG	
6		0.393000	32.16	10.15	42.31	79.00	-36.69	QP	
7		4.989750	29.69	10.33	40.02	73.00	-32.98	QP	
8		4.989750	27.51	10.33	37.84	60.00	-22.16	AVG	
9		9.856500	37.18	10.42	47.60	73.00	-25.40	QP	
10	*	9.856500	34.46	10.42	44.88	60.00	-15.12	AVG	
11		25.010250	36.39	10.92	47.31	73.00	-25.69	QP	
12		25.010250	33.30	10.92	44.22	60.00	-15.78	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Neutral



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	32.27	10.11	42.38	79.00	-36.62	QP	
2		0.188250	22.45	10.11	32.56	66.00	-33.44	AVG	
3		0.390750	26.19	10.16	36.35	66.00	-29.65	AVG	
4		0.393000	36.22	10.16	46.38	79.00	-32.62	QP	
5		3.194250	25.79	10.29	36.08	60.00	-23.92	AVG	
6		3.327000	30.72	10.29	41.01	73.00	-31.99	QP	
7		4.989750	33.65	10.32	43.97	73.00	-29.03	QP	
8		4.989750	31.52	10.32	41.84	60.00	-18.16	AVG	
9		9.795750	42.29	10.43	52.72	73.00	-20.28	QP	
10	*	9.795750	40.34	10.43	50.77	60.00	-9.23	AVG	
11		25.012500	39.10	10.93	50.03	73.00	-22.97	QP	
12		25.012500	36.09	10.93	47.02	60.00	-12.98	AVG	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

5 EMC EMISSION TEST- EN 55011

5.1 CONDUCTED DISTURBANCES TEST

5.1.1 LIMITS

Table 2 – Disturbance voltage limits for class A group 1 equipment measured on a test site (a.c. mains power port)

Frequency range MHz	Rated power of ≤ 20 kVA [c]		Rated power of > 20 kVA and ≤ 75 kVA [a, c]		High power electronic systems and equipment, Rated power of > 75 kVA [b, c]	
	Quasi-peak dB(μV)	Average dB(μV)	Quasi-peak dB(μV)	Average dB(μV)	Quasi-peak dB(μV)	Average dB(μV)
0,15 – 0,50	79	66	100	90	130	120
0,50 – 5	73	60	86	76	125	115
5 – 30	73	60	90 decreasing linearly with logarithm of frequency to 73	80 decreasing linearly with logarithm of frequency to 60	115	105

At the transition frequency, the more stringent limit shall apply.

For class A equipment intended to be connected solely to isolated neutral or high impedance earthed (IT) industrial power distribution networks (see IEC 60364-1) the limits for equipment with a rated power > 75 kVA may be applied, regardless of its actual rated power.

NOTE A rated input or output power of 20 kVA corresponds for example to a current of approximately 29 A per phase in case of 400 V three-phase power supply networks, and to a current of approximately 58 A per phase in case of 200 V three phase power supply networks.

a These limits apply to equipment with a rated power > 20 kVA and intended to be connected to a dedicated power transformer or generator, and which is not connected to low voltage (LV) overhead power lines. For equipment not intended to be connected to a user specific power transformer the limits for ≤ 20 kVA apply. The manufacturer, and/or supplier shall provide information on installation measures that can be used to reduce emissions from the installed equipment. In particular it shall be indicated that this equipment is intended to be connected to a dedicated power transformer or generator and not to LV overhead power lines.

b These limits apply only to high power electronic systems and equipment with a rated power greater than 75 kVA when intended to be installed as follows:

- installation is supplied from a dedicated power transformer or generator, and which is not connected to Low Voltage (LV) overhead power lines,
- installation is physically separated from residential environments by distance greater than 30 m or by a structure which acts as a barrier to radiated phenomena,
- the manufacturer and/or supplier shall indicate that this equipment meets the disturbance voltage limits for high power electronic systems and equipment of rated input power > 75 kVA and provide information on installation measures to be applied by the installer. In particular, it shall be indicated that this equipment is intended to be used in an installation which is powered by a dedicated power transformer or generator and not by LV overhead power lines.

c Selection of the appropriate set of limits shall be based on the rated a.c. power stated by the manufacturer.

Table 3 – Limits for conducted disturbances of class A group 1 equipment measured on a test site (d.c. power port)

Frequency range MHz	Rated power of ≤ 20 kVA [a]		Rated power of > 20 kVA to ≤ 75 kVA [a, b]				Rated power of > 75 kVA [a, b]			
	Voltage limits		Voltage limits		Current limits		Voltage limits		Current limits	
	QP dB(μV)	AV dB(μV)	QP dB(μV)	AV dB(μV)	QP dB(μA)	AV dB(μA)	QP dB(μV)	AV dB(μV)	QP dB(μA)	AV dB(μA)
0,15 to 5	97 to 89	84 to 76	116 to 106	106 to 96	72 to 62	62 to 52	132 to 122	122 to 112	88 to 78	78 to 68
5 to 30	89	76	106 to 89	96 to 76	62 to 45	52 to 32	122 to 105	112 to 92	78 to 61	68 to 48

In certain frequency ranges, the limits in this table decrease linearly with logarithm of frequency.

[a] Selection of the appropriate set of limits shall be based on the rated a.c. power stated by the manufacturer.

[b] These limits apply to equipment with a rated power > 20 kVA and intended to be installed in a large photovoltaic power generating system by a professional. In the manual accompanying the product, the manufacturer, and/or supplier shall provide information on mitigation measures that can be used to reduce emissions from the installed equipment, with the goal of preventing harmful interference to radio reception in a distance of 30 m from the installation. In particular it shall be indicated that this equipment can be equipped with additional filtering and that installation is physically separated from residential environments by distance greater than 30 m. The installer is invited to check the mitigated installation against CISPR 11 in-situ measurements as indicated in clause 6.4 of this standard.

Table 4 – Disturbance voltage limits for class B group 1 equipment measured on a test site (a.c. mains power port)

Frequency range MHz	Quasi-peak dB(μV)	Average dB(μV)
0,15 – 0,50	66 Decreasing linearly with logarithm of frequency to 56	56 Decreasing linearly with logarithm of frequency to 46
0,50 – 5	56	46
5 – 30	60	50

At the transition frequency, the more stringent limit shall apply.

Table 5 – Disturbance voltage limits for class B group 1 equipment measured on a test site (d.c. power port)

Frequency range MHz	Quasi-peak dB(μV)	Average dB(μV)
0,15 – 0,50	84 Decreasing linearly with logarithm of frequency to 74	74 Decreasing linearly with logarithm of frequency to 64
0,50 – 30	74	64

Table 19 – Applicability of measurements at d.c. power ports

Cable length L	Class B group 1 equipment	Class A group 1 equipment
$L < 3$ m	No measurements are required	No measurement are required
3 m ≤ L < 30 m	For measurements, the limits in Table 5 apply The frequency range for measurement starts at a frequency equal to: f(MHz) = 60/L	For measurements, the limits in Table 3 apply [a)] The frequency range for measurement starts at a frequency equal to: f(MHz) = 60/L
$L \geq 30$ m	For measurements, the limits in Table 5 apply	For measurements, the limits in Table 3 apply [a)]

L: maximum length of a cable (in metres) connected to an LV d.c. power port, and provided with the product or as specified by manufacturer. Where no maximum cable length is specified, L shall be considered as longer than 30 m.

This table applies unless specific conditions are given in the applicable product standard leading at least to the same level of protection of radio reception. Product standards may define specific conditions according to their particular application with the purpose of avoiding radiation.

a) No limits apply if the equipment is installed using good engineering practice regarding EMC.

Examples of good engineering practice are:

- symmetrical d.c. port line configuration,
- installation internal to the building,
- grounded metallic cable trays,
- use of shielded cables,
- manage a separation distance that acts as a barrier from residential environment (eg. greater than 30 m).

If exception a) is used, the installer may refer to CISPR 11 for in-situ measurement.

NOTE:
(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
(3) 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
Calculation example:

Reading Level (dBµV)		Correct Factor (dB)		Measurement Value (dBµV/m)		Limit Value (dBµV/m)		Margin Level (dB)
38.22	+	3.45	=	41.67	-	60	=	-18.33

5.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Test Cable	EMCI	EMCRG142S-SM-SM-5000	230609	2025/8/8	2026/8/7
2	EMI Test Receiver	R&S	ESR3	103133	2025/9/3	2026/9/2
3	LISN	Schwarzbeck	NNLK 8129	00664	2026/3/18	2027/3/17
4	Pulse Limiter	Schwarzbeck	VTSD 9561-F	01165	2025/9/24	2026/9/23
5	Measurement Software	Farad	EZ_EMC (Ver.E-LAB-5A2.2 2021)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

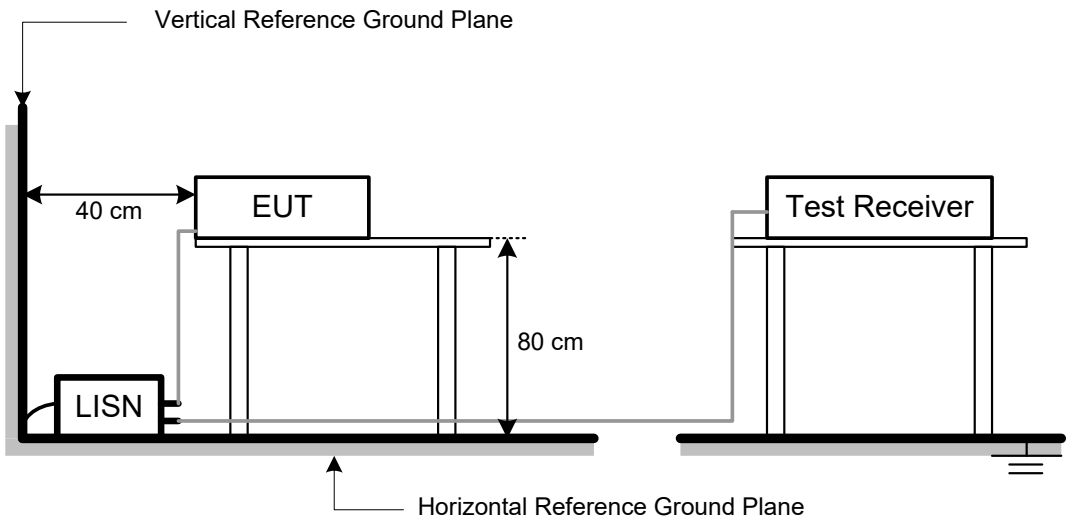
5.1.3 TEST PROCEDURE

a. The EUT was placed 0.8 m above the horizontal ground plane with the EUT being connected to the power mains through a line impedance stabilization network (LISN).
All other support equipment were powered from an additional LISN(s).
The LISN provides 50 Ohm/50uH of impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle to keep the cable above 40 cm.
c. Excess I/O cables that are not connected to a peripheral shall be bundled in the center.
The end of the cable will be terminated, using the correct terminating impedance.
The overall length shall not exceed 1 m.
d. The LISN is spaced at least 80 cm from the nearest part of the EUT chassis.
e. For the actual test configuration, please refer to the related Item -TEST PHOTOS.

5.1.4 DEVIATION FROM TEST STANDARD

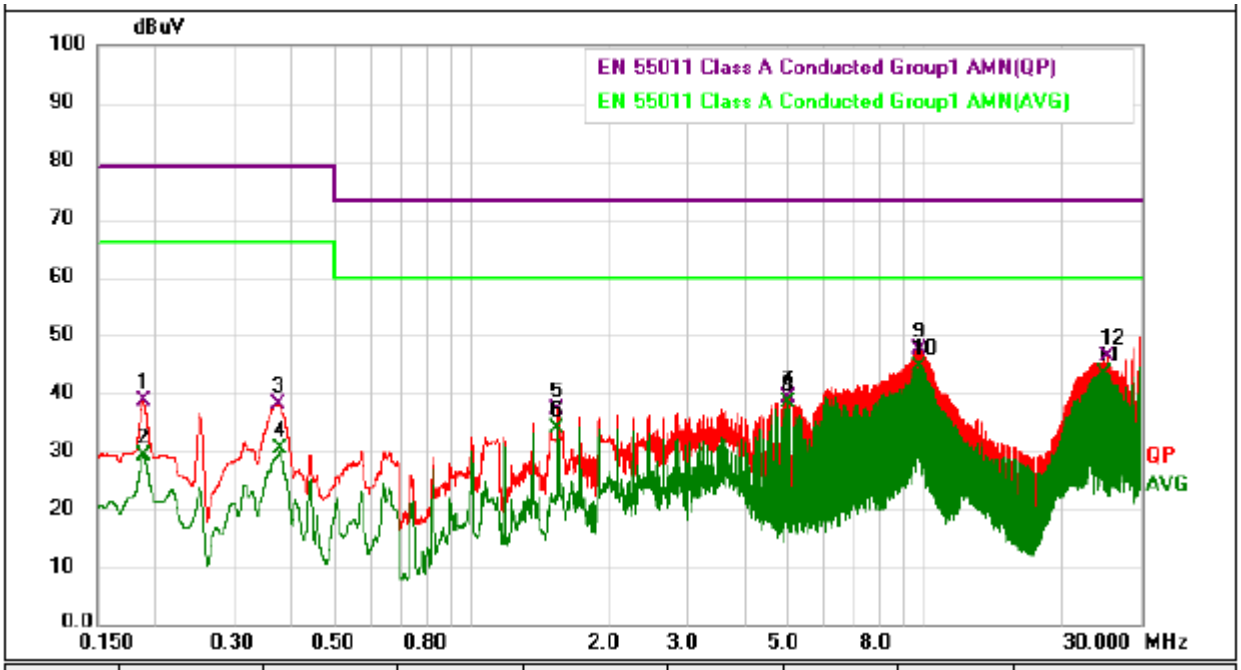
No deviation.

5.1.5 TEST SETUP



5.1.6 TEST RESULT

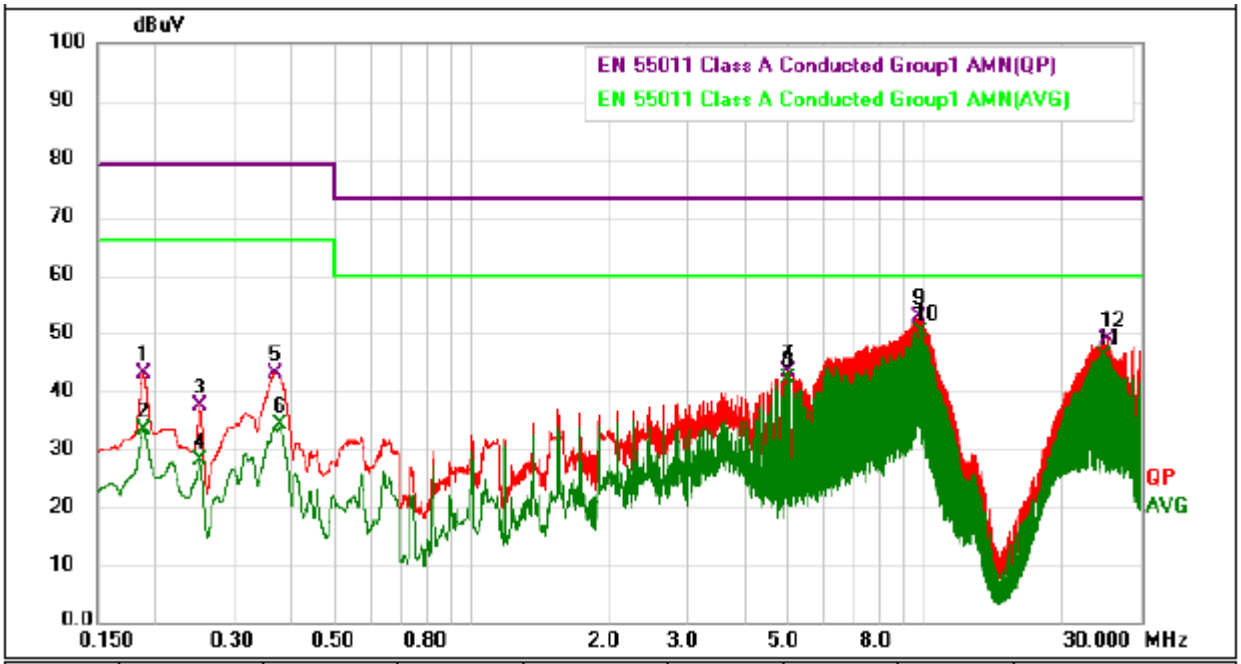
Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Line



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	28.66	10.10	38.76	79.00	-40.24	QP	
2		0.188250	19.27	10.10	29.37	66.00	-36.63	AVG	
3		0.375000	27.95	10.14	38.09	79.00	-40.91	QP	
4		0.377250	20.23	10.14	30.37	66.00	-35.63	AVG	
5		1.549500	26.93	10.21	37.14	73.00	-35.86	QP	
6		1.549500	23.79	10.21	34.00	60.00	-26.00	AVG	
7		4.989750	28.97	10.33	39.30	73.00	-33.70	QP	
8		4.989750	27.97	10.33	38.30	60.00	-21.70	AVG	
9		9.732750	37.07	10.42	47.49	73.00	-25.51	QP	
10	*	9.732750	34.19	10.42	44.61	60.00	-15.39	AVG	
11		24.969750	32.37	10.92	43.29	60.00	-16.71	AVG	
12		25.336500	35.40	10.95	46.35	73.00	-26.65	QP	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	Mode 1	Tested Date	2026/7/8
Test Voltage	AC 230V/50Hz	Phase	Neutral



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB)	Meas. Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1		0.188250	32.93	10.11	43.04	79.00	-35.96	QP	
2		0.188250	23.33	10.11	33.44	66.00	-32.56	AVG	
3		0.251250	27.24	10.12	37.36	79.00	-41.64	QP	
4		0.251250	18.06	10.12	28.18	66.00	-37.82	AVG	
5		0.368250	33.06	10.15	43.21	79.00	-35.79	QP	
6		0.377250	24.09	10.16	34.25	66.00	-31.75	AVG	
7		4.989750	33.08	10.32	43.40	73.00	-29.60	QP	
8		4.989750	31.90	10.32	42.22	60.00	-17.78	AVG	
9		9.732750	42.39	10.43	52.82	73.00	-20.18	QP	
10	*	9.793500	39.70	10.43	50.13	60.00	-9.87	AVG	
11		24.978750	35.14	10.93	46.07	60.00	-13.93	AVG	
12		25.341000	38.00	10.97	48.97	73.00	-24.03	QP	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

5.2 ELECTROMAGNETIC RADIATION DISTURBANCE TEST

5.2.1 LIMITS

Table 6 – Electromagnetic radiation disturbance limits for class A group 1 equipment measured on a test site

Frequency range MHz	OATS or SAC				FAR	
	10 m measuring distance rated power of		3 m measuring distance [b] rated power of		3 m measuring distance [b,c] rated power of	
	≤ 20 kVA [d]	> 20 kVA [a, d]	≤ 20 kVA [d]	> 20 kVA [a, d]	≤ 20 kVA [d]	> 20 kVA [a, d]
	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)
30 – 230	40	50	50	60	52 decreasing linearly with logarithm of frequency to 45	62 decreasing linearly with logarithm of frequency to 55
230 – 1 000	47	50	57	60	52	55

On an OATS or in a SAC, class A equipment can be measured at a nominal distance of 3 m, 10 m or 30 m. In case of measurements at a separation distance of 30 m, an inverse proportionality factor of 20 dB per decade shall be used to normalize the measured data to the specified distance for determining compliance.

At the transition frequency, the more stringent limit shall apply.

In the frequency range 30 MHz to 230 MHz, the limit for measurements in the FAR decreases linearly with the logarithm of frequency.

[a] These limits apply to equipment with a rated power of > 20 kVA and intended to be used at locations where there is a distance greater than 30 m between the equipment and third party sensitive radio communications. The manufacturer shall indicate in the technical documentation that this equipment is intended to be used at locations where the separation distance to third party sensitive radio services is > 30 m. If these conditions are not met, then the limits for ≤ 20 kVA apply.

[b] The 3 m separation distance applies only to small size equipment meeting the size criterion defined in 3.17.

[c] The table-top equipment shall fit into the validated test volume of the FAR.

[d] Selection of the appropriate set of limits shall be based on the rated a.c. power stated by the manufacturer.

Table 7 – Electromagnetic radiation disturbance limits for class B group 1 equipment measured on a test site

Frequency range MHz	OATS or SAC		FAR
	10 m measuring distance	3 m measuring distance [a]	3 m measuring distance [a,b]
	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)	Quasi-peak dB(μV/m)
30 – 230	30	40	42 Decreasing linearly with logarithm of frequency to 35
230 – 1 000	37	47	42
On an OATS or in a SAC, class B equipment can be measured at a nominal distance of 3 m or 10 m. At the transition frequency, the more stringent limit shall apply.			
[a] The 3 m separation distance applies only to *small size equipment* meeting the size criterion defined in 3.17. [b] The table-top equipment shall fit into the validated test volume of the FAR.			

NOTE:
(1) The tighter limit applies at the band edges.
(2) Emission level (dBuV/m) = 20log Emission level (uV/m).
3 m Emission level = 10 m Emission level + 20log(10 m/3 m).
(3) 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
Calculation example:

Reading Level (dBμV)		Correct Factor (dB/m)		Measurement Value (dBμV/m)		Limit Value (dBμV/m)		Margin Level (dB)
19.11	+	2.11	=	21.22	-	40	=	-18.78

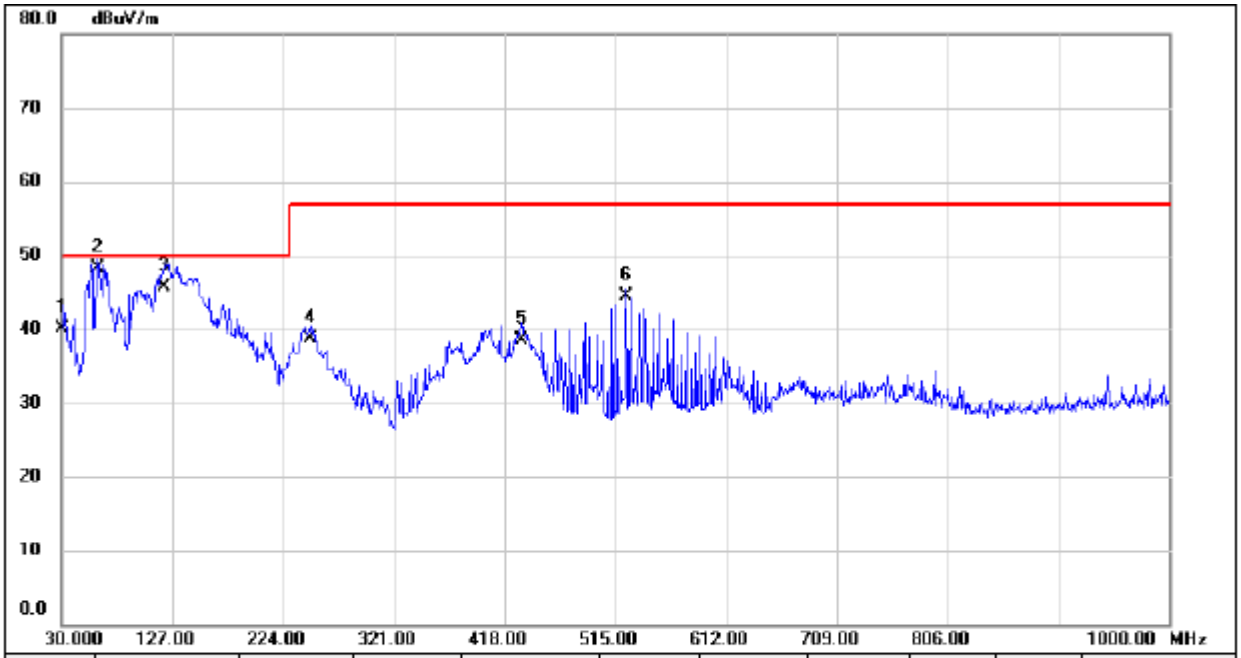
5.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Log-Bicon Antenna	Schwarzbeck	VULB 9168	01578	2025/7/31	2026/7/30
2	Attenuator	INMET	EMCI-N-6-05	AT-N0576	2025/7/31	2026/7/30
3	Pre-Amplifier	EMCI	EMC001330	980908	2025/7/22	2026/7/21
4	Test Cable	EMCI	EMC104-SM-SM-6000	230539	2025/7/22	2026/7/21
5	Test Cable	EMCI	EMC104-SM-SM-2500	230542	2025/7/22	2026/7/21
6	Test Cable	EMCI	EMC104-SM-SN-1000	230543	2025/7/22	2026/7/21
7	EXA Signal Analyzer	Keysight	N9010A	MY52220990	2025/10/1	2026/9/30
8	Measurement Software	Farad	EZ_EMC (Ver. NB-03A1-01)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

5.2.3 TEST RESULT

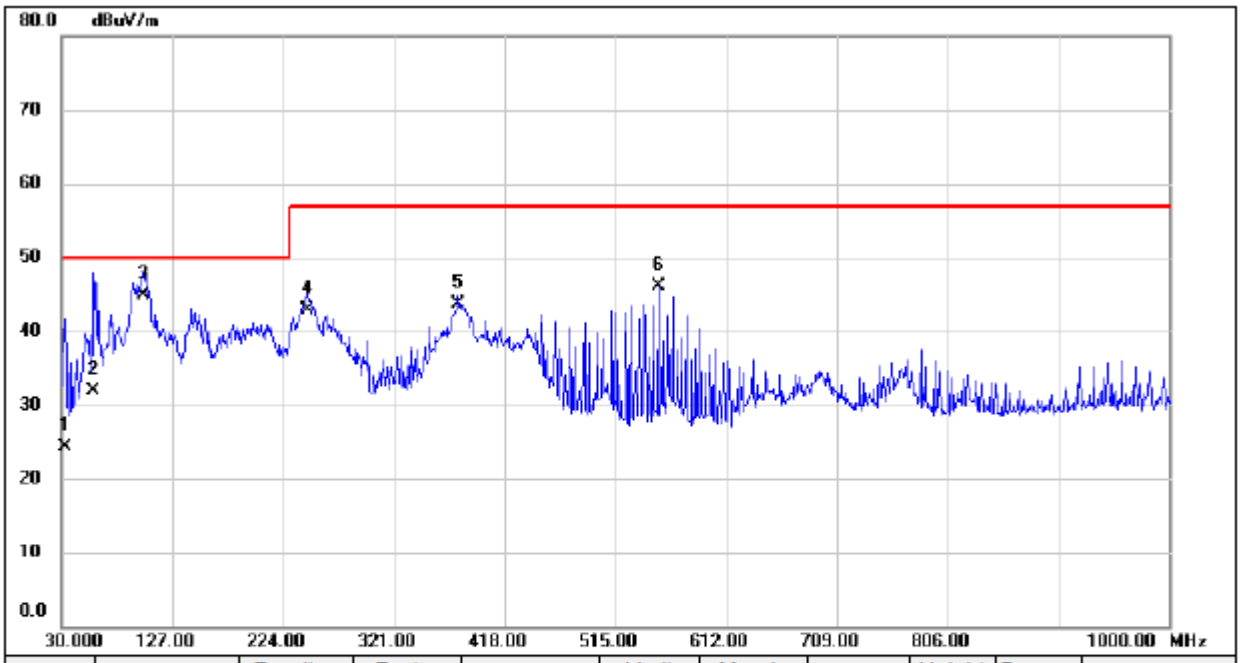
Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Vertical



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		30.0000	53.60	-13.58	40.02	50.00	-9.98	QP	100	182	
2	*	62.0100	61.42	-13.02	48.40	50.00	-1.60	QP	100	116	
3		120.2100	60.46	-14.70	45.76	50.00	-4.24	QP	100	213	
4		247.2800	51.83	-13.19	38.64	57.00	-18.36	QP	100	80	
5		432.5500	46.14	-7.69	38.45	57.00	-18.55	QP	100	190	
6		524.7000	50.62	-6.13	44.49	57.00	-12.51	QP	100	154	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

Test Mode	Mode 1	Tested Date	2026/7/9
Test Voltage	AC 230V/50Hz	Polarization	Horizontal



No.		Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Meas. Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Comment
1		32.9100	37.65	-13.40	24.25	50.00	-25.75	QP	100	226	
2		58.1300	44.37	-12.55	31.82	50.00	-18.18	QP	100	285	
3	*	101.7800	61.62	-16.67	44.95	50.00	-5.05	QP	200	194	
4		245.3400	56.33	-13.35	42.98	57.00	-14.02	QP	100	305	
5		377.2600	52.87	-9.22	43.65	57.00	-13.35	QP	100	230	
6		552.8300	51.65	-5.61	46.04	57.00	-10.96	QP	100	64	

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

5.3 HARMONIC CURRENT EMISSIONS TEST

5.3.1 LIMITS

EN IEC 61000-3-2 / IEC 61000-3-2						
Equipment Category	Harmonic Order	Maximum Permissible Harmonic Current	Equipment Category	Harmonic Order	Maximum Permissible Harmonic Current	
	n	A		n	A	mA/w
Class A	Odd Harmonics		Class D	Odd Harmonics only		
	3	2.30		3	2.30	3.4
	5	1.14		5	1.14	1.9
	7	0.77		7	0.77	1.0
	9	0.40		9	0.40	0.5
	11	0.33		11	0.33	0.35
	13	0.21		13	0.21	0.30
	15≤n≤39	0.15 x 15/n		15≤n≤39	0.15 x 15/n	3.85/n
	Even Harmonics					
	2	1.08				
	4	0.43				
	6	0.30				
	8≤n≤40	0.23 x 8/n				

If the rated power of EUT is less than 75 W, limits are not specified.

5.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Compliance Test System	APS	ECTS2-3600F-C	550211	2025/8/26	2026/8/25
2	Measurement Software	APS	HFA (16A) (v1.0.0.14)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

5.3.3 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 m above the ground and operated to produce the maximum harmonic components under normal operating conditions.
The EUT with load was placed on the ground plane and operated to produce the maximum harmonic components under normal operating conditions.

b. The classification of EUT is according to of EN IEC 61000-3-2 / IEC 61000-3-2.
The EUT is classified as follows:
Class A:
Equipment not specified as belonging to Class B, C or D shall be considered as Class A equipment.
Some examples of Class A equipment are:
- balanced three-phase equipment;
- household appliances, excluding those specified as belonging to Class B, C or D;
- vacuum cleaners;
- high pressure cleaners;
- tools, excluding portable tools;
- independent phase control dimmers;
- audio equipment;
- professional luminaires for stage lighting and studios.

Class B:
- portable tools;
- arc welding equipment which is not professional equipment.

Class C:
- lighting equipment.

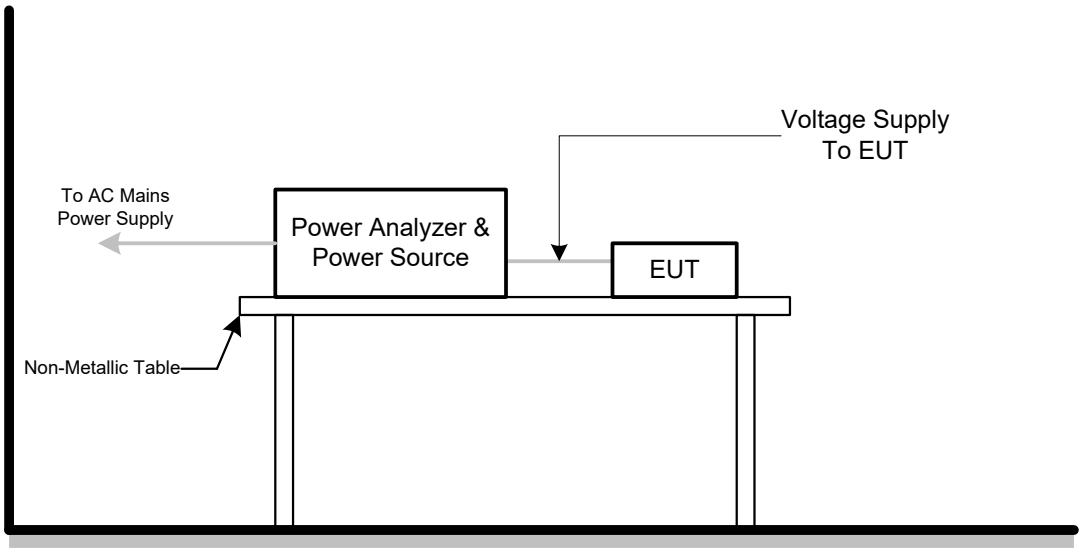
Class D:
Equipment having a specified power according to 6.3.2, less than or equal to 600 W, of the following types:
- personal computers and personal computer monitors;
- television receivers;
- refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

c. 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.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation.

5.3.5 TEST SETUP



5.3.6 TEST RESULT

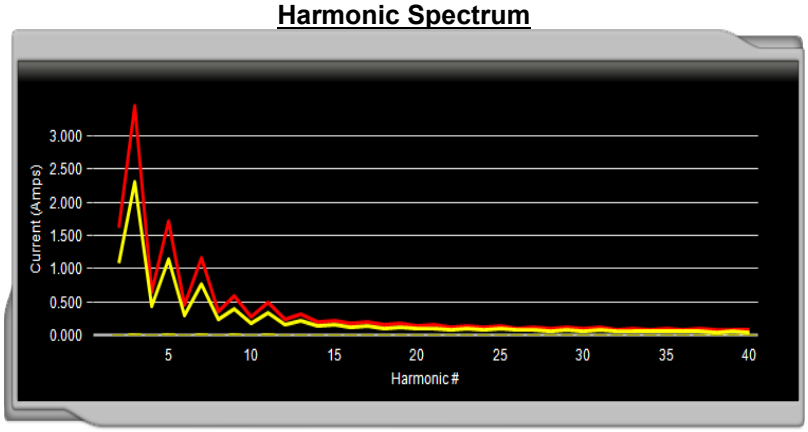
Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/7
Note	-		

Harmonics incl. inter-harmonics

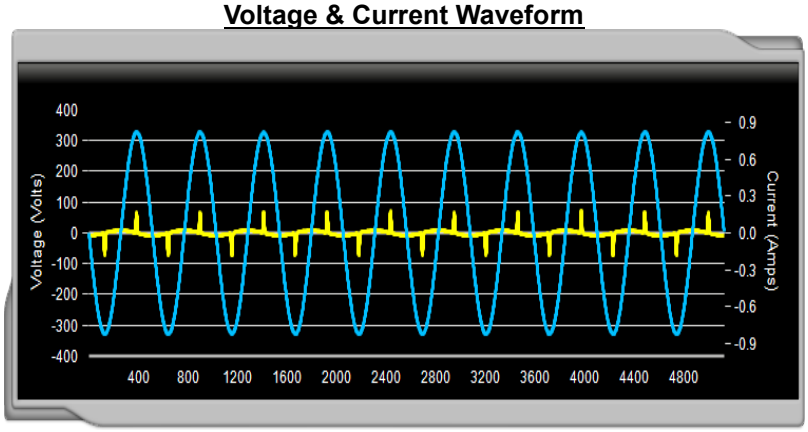
General Test Data: (Phase A)

Vrms (Volts)/V-pk/V-CF:	231.68 / 327.7 / 1.414	Frequency (Hz):	50.0001
I_rms (Amps):	0.038	Power (VA)/VAR:	8.94/8.45
I_fund/I_ref (Amps):	0.020 / 0.0198	Power (W):	2.91
I_peak (Amps)/I-CF:	0.207 / 5.294	Power Factor:	0.328
V-THD (%):	0.12	I-THD (%):	166.66
POHC (A):	0.0105 (method C.3)	POHC Limit (A):	0.2514
I-THC (A):	0.033	Power (W)(Min/Max):	2.88/2.95
Phase angle of H5 (deg):	3.39		

Harmonic Spectrum



Voltage & Current Waveform



Current Test Result Summary (Run time)

Current Harmonics (values at the end of test)

Harm No.	Harm. Ave.	Limit (100%)	% Of Limits	Result (Ave.)	Result (Max.)	Harm. Win.	Win. (150%)	% Of Max
2	0.0006	1.0800	0.1	PASS	PASS	0.0006	1.6200	0.0
3	0.0126	2.3000	0.5	PASS	PASS	0.0126	3.4500	0.4
4	0.0005	0.4300	0.1	PASS	PASS	0.0005	0.6450	0.1
5	0.0120	1.1400	1.1	PASS	PASS	0.0120	1.7100	0.7
6	0.0006	0.3000	0.2	PASS	PASS	0.0006	0.4500	0.1
7	0.0118	0.7700	1.5	PASS	PASS	0.0118	1.1550	1.0
8	0.0005	0.2300	0.2	PASS	PASS	0.0005	0.3450	0.1
9	0.0111	0.4000	2.8	PASS	PASS	0.0111	0.6000	1.9
10	0.0005	0.1840	0.3	PASS	PASS	0.0005	0.2760	0.2
11	0.0105	0.3300	3.2	PASS	PASS	0.0105	0.4950	2.1
12	0.0004	0.1533	0.3	PASS	PASS	0.0005	0.2300	0.2
13	0.0097	0.2100	4.6	PASS	PASS	0.0097	0.3150	3.1
14	0.0004	0.1314	0.3	PASS	PASS	0.0004	0.1971	0.2
15	0.0089	0.1500	5.9	PASS	PASS	0.0089	0.2250	4.0
16	0.0003	0.1150	0.3	PASS	PASS	0.0004	0.1725	0.2
17	0.0080	0.1324	6.1	PASS	PASS	0.0080	0.1986	4.1
18	0.0004	0.1022	0.4	PASS	PASS	0.0004	0.1533	0.3
19	0.0071	0.1184	6.0	PASS	PASS	0.0071	0.1776	4.0
20	0.0003	0.0920	0.3	PASS	PASS	0.0003	0.1380	0.3
21	0.0062	0.1071	5.7	PASS	PASS	0.0062	0.1607	3.8
22	0.0003	0.0836	0.4	PASS	PASS	0.0003	0.1254	0.3
23	0.0053	0.0978	5.4	PASS	PASS	0.0053	0.1467	3.6
24	0.0003	0.0767	0.4	PASS	PASS	0.0003	0.1151	0.3
25	0.0043	0.0900	4.8	PASS	PASS	0.0044	0.1350	3.2
26	0.0002	0.0708	0.3	PASS	PASS	0.0002	0.1062	0.2
27	0.0035	0.0833	4.2	PASS	PASS	0.0035	0.1250	2.8
28	0.0002	0.0657	0.3	PASS	PASS	0.0002	0.0986	0.2
29	0.0027	0.0776	3.5	PASS	PASS	0.0027	0.1164	2.3
30	0.0002	0.0613	0.3	PASS	PASS	0.0002	0.0920	0.2
31	0.0020	0.0726	2.7	PASS	PASS	0.0020	0.1089	1.8
32	0.0002	0.0575	0.3	PASS	PASS	0.0002	0.0863	0.2
33	0.0013	0.0682	1.9	PASS	PASS	0.0013	0.1023	1.3
34	0.0002	0.0541	0.4	PASS	PASS	0.0002	0.0812	0.3
35	0.0008	0.0643	1.2	PASS	PASS	0.0008	0.0965	0.8
36	0.0002	0.0511	0.4	PASS	PASS	0.0002	0.0767	0.3
37	0.0003	0.0608	0.6	PASS	PASS	0.0004	0.0912	0.4
38	0.0002	0.0484	0.4	PASS	PASS	0.0002	0.0726	0.3
39	0.0003	0.0577	0.5	PASS	PASS	0.0003	0.0866	0.4
40	0.0001	0.0460	0.3	PASS	PASS	0.0002	0.0690	0.2

Next page continued.

Voltage Source Verification Data (Run time)

Power Source Verification Data

Harm No.	Harm. Value	Harm. Limit	% Of Limits	% Of Vfund	Result
RMS	231.696	230.000	100.737	100.000	OK
2	0.036	0.463	7.808	0.016	OK
3	0.126	2.085	6.063	0.055	OK
4	0.140	0.463	30.163	0.060	OK
5	0.013	0.927	1.374	0.005	OK
6	0.028	0.463	6.023	0.012	OK
7	0.114	0.695	16.437	0.049	OK
8	0.033	0.463	7.170	0.014	OK
9	0.020	0.463	4.247	0.008	OK
10	0.028	0.463	6.033	0.012	OK
11	0.125	0.232	54.117	0.054	OK
12	0.011	0.232	4.703	0.005	OK
13	0.029	0.232	12.533	0.013	OK
14	0.051	0.232	21.817	0.022	OK
15	0.065	0.232	28.086	0.028	OK
16	0.032	0.232	13.608	0.014	OK
17	0.071	0.232	30.845	0.031	OK
18	0.034	0.232	14.825	0.015	OK
19	0.038	0.232	16.305	0.016	OK
20	0.012	0.232	5.204	0.005	OK
21	0.047	0.232	20.108	0.020	OK
22	0.038	0.232	16.607	0.017	OK
23	0.018	0.232	7.796	0.008	OK
24	0.025	0.232	10.942	0.011	OK
25	0.008	0.232	3.537	0.004	OK
26	0.012	0.232	5.356	0.005	OK
27	0.023	0.232	9.904	0.010	OK
28	0.015	0.232	6.459	0.006	OK
29	0.023	0.232	9.848	0.010	OK
30	0.015	0.232	6.300	0.006	OK
31	0.023	0.232	9.835	0.010	OK
32	0.026	0.232	11.365	0.011	OK
33	0.019	0.232	8.070	0.008	OK
34	0.009	0.232	3.845	0.004	OK
35	0.017	0.232	7.465	0.007	OK
36	0.025	0.232	10.949	0.011	OK
37	0.005	0.232	2.250	0.002	OK
38	0.010	0.232	4.444	0.004	OK
39	0.027	0.232	11.705	0.012	OK
40	0.014	0.232	5.922	0.006	OK

5.4 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER TEST

5.4.1 LIMITS

EN 61000-3-3 / IEC 61000-3-3		
Tests	Limits	Descriptions
P_{st}	≤ 1.0	short-term flicker severity
P_{lt}	≤ 0.65	long-term flicker severity
T_{max}	≤ 500 ms	maximum time duration during the observation period that the voltage deviation d(t) exceeds the limit for d_c
d_c	≤ 3.3 %	maximum steady state voltage change during an observation period
d_{max}	≤ 4 %	maximum absolute voltage change during an observation period

5.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Compliance Test System	APS	ECTS2-3600F-C	550211	2025/8/26	2026/8/25
2	Measurement Software	APS	HFA (16A) (v1.0.0.14)	N/A	N/A	N/A

REMARK:
(1) "N/A" denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

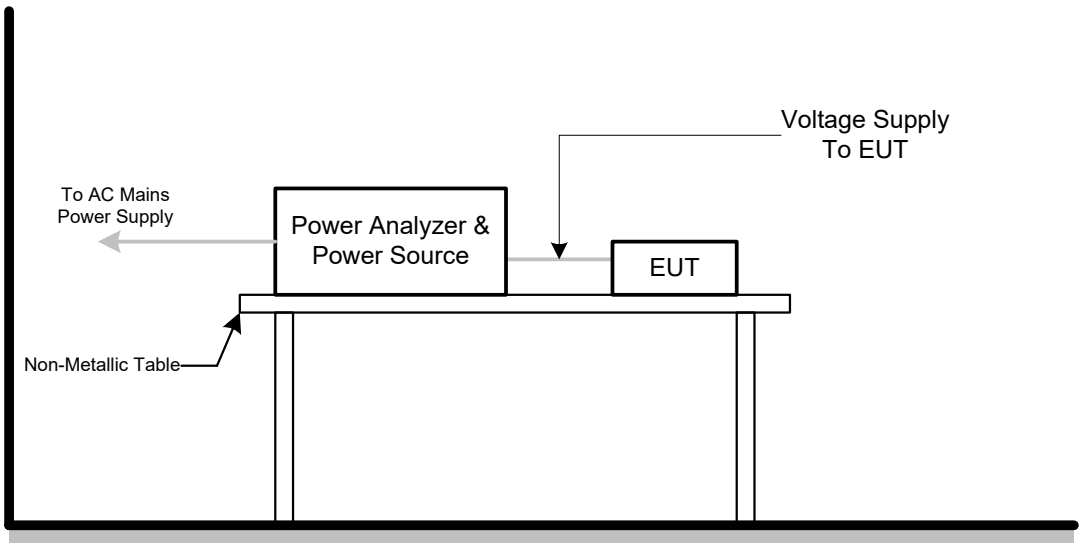
5.4.3 TEST PROCEDURE

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 TEST SETUP



5.4.6 TEST RESULT

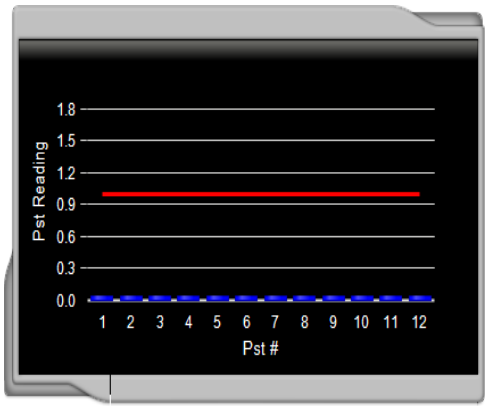
Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/7
Note	-		

Last Test Parameters:

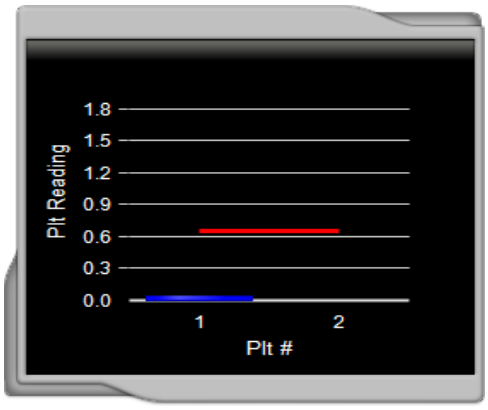
Phase A

Vrms (Volts):	231.65	Frequency (Hz):	50.00
I_rms (Amps):	0.038	Power (W):	2.94
V-THD (%):	0.138	T-Max (ms):	0 (500)
dmax (%):	0.000 (4.00)	Hi dmax (%):	0.000 (4.00)
dc (%):	0.000 (3.30)	Hi dc (%):	0.000 (3.30)
Pst-001 :	0.039 (1.000)	Pst-002 :	0.039 (1.000)
Pst-003 :	0.039 (1.000)	Pst-004 :	0.039 (1.000)
Pst-005 :	0.039 (1.000)	Pst-006 :	0.039 (1.000)
Pst-007 :	0.039 (1.000)	Pst-008 :	0.039 (1.000)
Pst-009 :	0.039 (1.000)	Pst-010 :	0.039 (1.000)
Pst-011 :	0.039 (1.000)	Pst-012 :	0.039 (1.000)
Plt-1 :	0.039 (0.650)		

Pst Spectrum



Plt Spectrum



6 IMMUNITY TEST - EN 55035

6.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERION

Environmental phenomenon and Reference Standard	Test Specification	Test Ports	Performance Criteria
Electrostatic discharges EN 61000-4-2 IEC 61000-4-2 (ESD)	±8 kV air discharge ±4 kV contact discharge	Enclosure ports (Direct Mode)	B
	±4 kV HCP discharge ±4 kV VCP discharge	Enclosure ports (Indirect Mode)	B
Continuous RF electromagnetic field disturbances, swept test EN IEC 61000-4-3 IEC 61000-4-3 (RS)	80 MHz to 1000 MHz 3 V/m (unmodulated, rms), 1 kHz, 80 %, AM modulated	Enclosure ports	A
Continuous RF electromagnetic field disturbances, spot test EN IEC 61000-4-3 IEC 61000-4-3 (RS)	1800 MHz ±1 % MHz, 2600 MHz ±1 % MHz, 3500 MHz ±1 % MHz, 5000MHz ±1 % MHz 3 V/m (unmodulated, rms), 1 kHz, 80 %, AM modulated	Enclosure ports	A
Electrical fast transients / burst EN 61000-4-4 IEC 61000-4-4 (EFT/BURST)	±0.5 kV(peak), 5/50 ns Tr/Th 5 kHz Repetition Frequency For CPE xDSL ports repetition frequency is 100 kHz.	Analogue/digital data ports **NOTE (1)**	B
	±0.5 kV(peak), 5/50 ns Tr/Th 5 kHz Repetition Frequency	DC network power ports	B
	±1 kV(peak), 5/50 ns Tr/Th 5 kHz Repetition Frequency	AC mains power ports	B
Surges EN 61000-4-5 IEC 61000-4-5	Port type: unshielded symmetrical Apply: lines to ground		
	Apply where primary protection is intended ±1 kV and ±4 kV, 10/700 (5/320) µs Tr/Th	Analogue/digital data ports **NOTE (1)(3)**	C
	Apply where primary protection is not intended ±1 kV, 10/700 (5/320) µs Tr/Th	Analogue/digital data ports **NOTE (1)(3)**	C
	Port type: coaxial or shielded Apply: shield to ground		
	±0.5 kV, 1.2/50 (8/20) µs Tr/Th	Analogue/digital data ports **NOTE(1)**	B
	Surges are applied line to reference ground for each individual line ±0.5 kV, 1.2/50 (8/20) µs Tr/Th	DC network power ports **NOTE (1)(2)**	B
	Apply between line and line ±1 kV, 1.2/50 (8/20) µs Tr/Th Apply between line and earth (ground) ±2 kV, 1.2/50 (8/20) µs Tr/Th	AC mains power ports	B

Environmental phenomenon and Reference Standard or Clause	Test Specification	Test Ports	Performance Criteria
Continuous induced RF disturbances EN IEC 61000-4-6 IEC 61000-4-6 (CS)	0.15 MHz to 10 MHz, 3 V 10 MHz to 30 MHz, 3 V to 1 V 30 MHz to 80 MHz, 1 V (unmodulated, rms), 80 % AM (1 kHz)	Analogue/digital data ports **NOTE (1)**	A
	0.15 MHz to 10 MHz, 3 V 10 MHz to 30 MHz, 3 V to 1 V 30 MHz to 80 MHz, 1 V (unmodulated, rms), 80 % AM (1 kHz)	DC network power ports **NOTE (1)**	A
	0.15 MHz to 10 MHz, 3 V 10 MHz to 30 MHz, 3 V to 1 V 30 MHz to 80 MHz, 1 V (unmodulated, rms), 80 % AM (1 kHz)	AC mains power ports	A
Power frequency magnetic field EN 61000-4-8 IEC 61000-4-8 (PFMF)	50, 60 Hz, 1 A/m	Enclosure ports	A
Voltage dips and Voltage interruptions EN IEC 61000-4-11 IEC 61000-4-11	Voltage dips Residual voltage <5 %, 0.5 cycles	AC mains power ports	B
	Voltage dips Residual voltage 70 %, 25 cycles for 50 Hz, 30 cycles for 60 Hz	AC mains power ports **NOTE (4)**	C
	Voltage interruptions Residual voltage <5 %, 250 cycles for 50 Hz, 300 cycles for 60 Hz	AC mains power ports **NOTE (4)**	C
Broadband impulse noise disturbances, repetitive 4.2.7	Impulse frequency and Test Level 0.15 MHz to 0.5 MHz, 107 dBµV 0.5 MHz to 10.5 MHz, 107 dBµV to 36 dBµV 10 MHz to 30 MHz, 36 dBµV to 30 dBµV	Analogue/digital data ports **NOTE (1)(5)(6)**	A
	Burst duration and Burst period 0.70 ms 8.3 ms (for 60 Hz) 10 ms (for 50 Hz)		
Broadband impulse noise disturbances, isolated 4.2.7	Impulse frequency and Test Level 0.15 MHz to 30 MHz, 110 dBµV	Analogue/digital data ports **NOTE (1)(5)(7)**	B
	Burst duration 0.24 ms, 10 ms, 300 ms		

NOTE:
(1) Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m.
(2) Applicable only to ports which, according to the manufacturer's specification, may connect directly to outdoor cables.
(3) Where the surge coupling network for the 10/700 (5/320) µs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) µs waveform and appropriate coupling network.
(4) Apply at only one supply frequency of the MME.
(5) Applicable only to CPE xDSL ports.
(6) Apply period based on the AC mains frequency.
(7) Apply all burst durations.

6.2 GENERAL PERFORMANCE CRITERIA

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

Criterion A (Clause 8.2)	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 (Clause 8.3)	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 (Clause 8.4)	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.

6.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

6.3.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-2 / IEC 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Required Performance Criterion	B
Discharge Voltage	Air Discharge: ±2 kV, ±4 kV, ±8 kV Contact Discharge: ±4 kV
Polarity	Positive & Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single Discharge
Discharge Period	1 s minimum

6.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	ESD Simulator	AMETEK	NSG437-04 ESD GERATOR US	P2540303799	2025/11/14	2026/11/13
2	Temperature/Relative Humidity Data Logger	HOBO	MX1101	21590145	2025/9/3	2026/9/2

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.3.3 TEST PROCEDURE

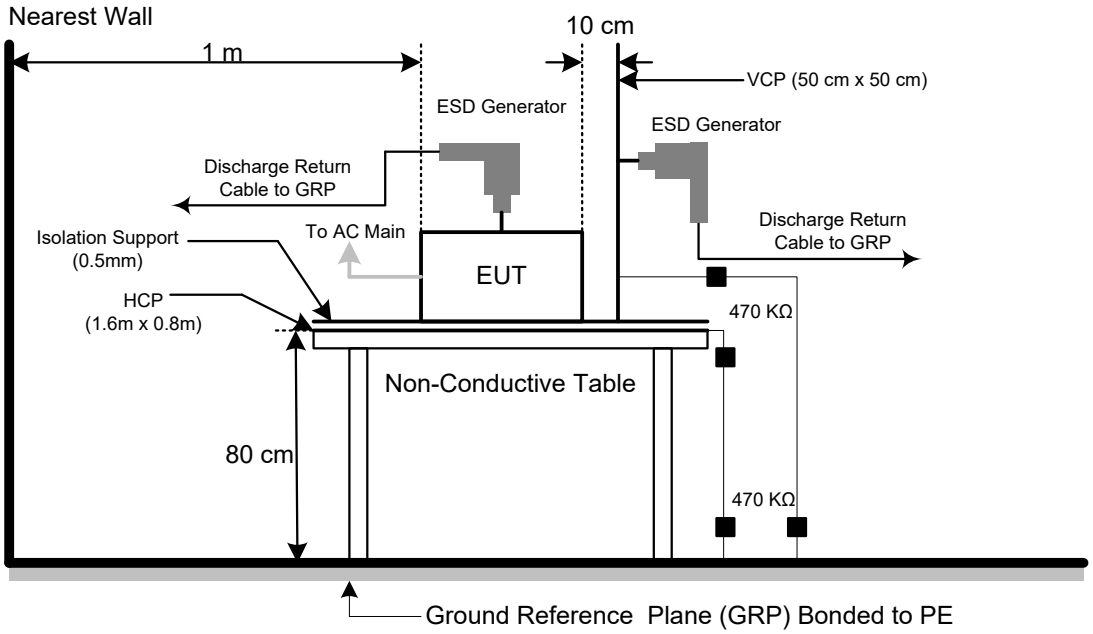
The configuration consisted of a wooden table 0.8 m high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25 mm thick, and 2.5 m square connected to the protective grounding system. A Horizontal Coupling Plane (1.6 m x 0.8 m) was placed on the table and attached 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 EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5 mm thickness. A distance of 1 m minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.
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 0.5 m x 0.5 m, is placed parallel to, and positioned at a distance 0.1 m 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 0.1 m from the EUT, with the Discharge Electrode touching the coupling plane.
   The four faces of the EUT will be performed with electrostatic discharge.
b. Air discharges at insulation surfaces of the EUT.
   It was at least ten single discharges with positive and negative at the same selected point.

6.3.4 DEVIATION FROM TEST STANDARD

No deviation.

6.3.5 TEST SETUP



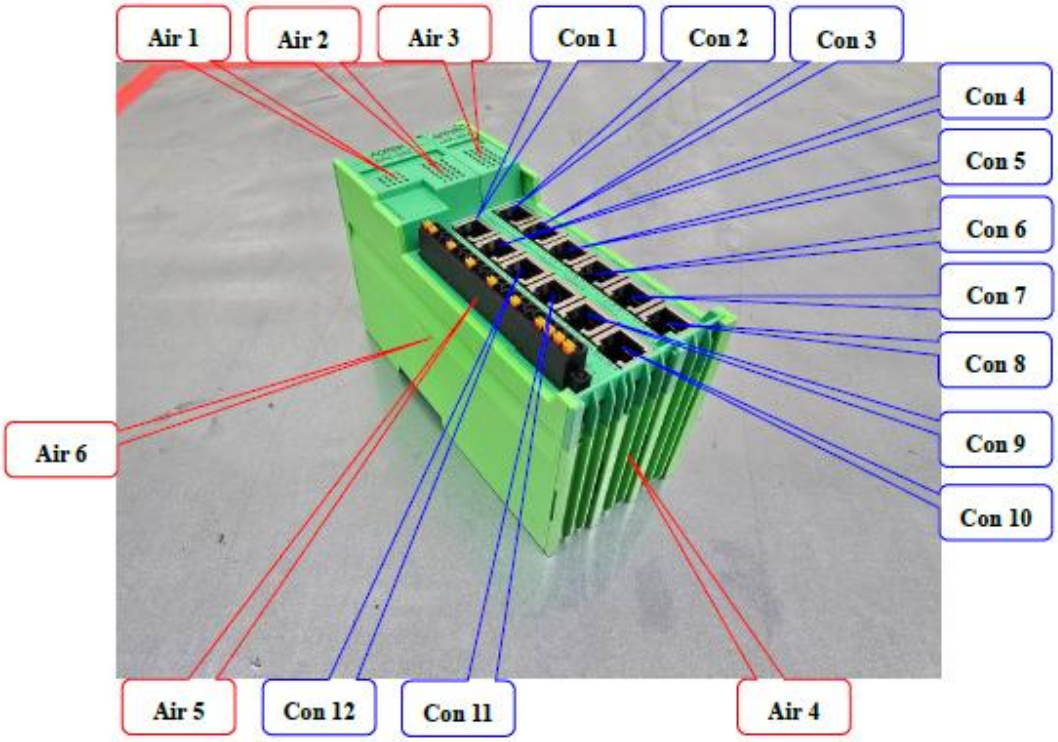
6.3.6 TEST RESULT

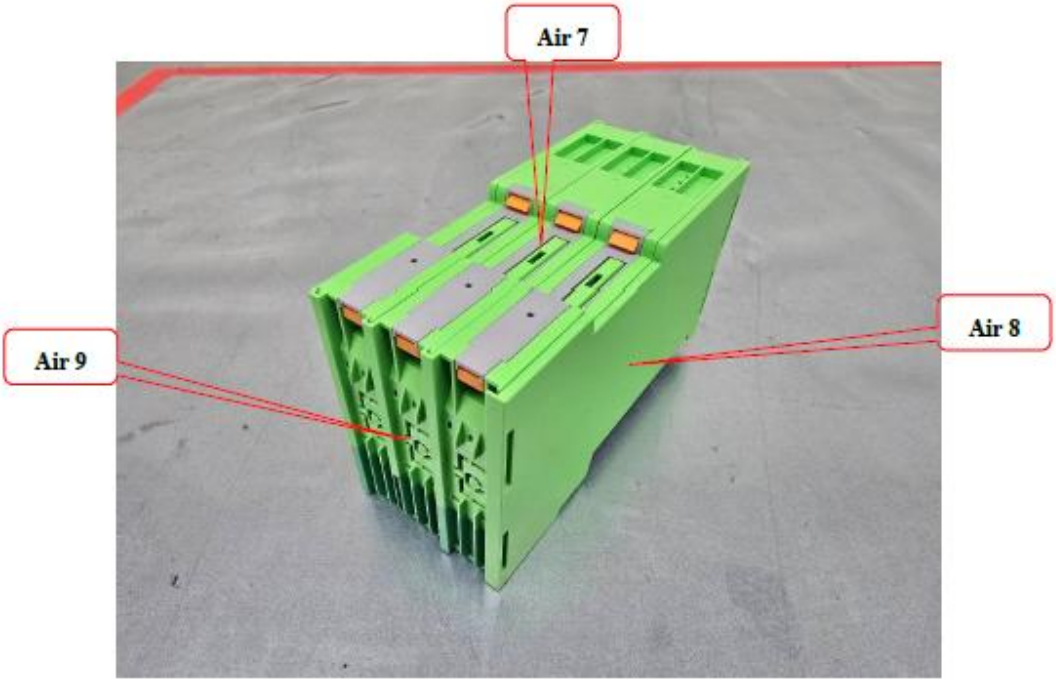
Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8
Situation	B: The indicator light turns off and will recover automatically after the test.		

Mode	Air Discharge								Contact Discharge							
Level	2 kV		4 kV		8 kV		-		4 kV		-		-		-	
Polarity	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1-2	A	A	A	A	A	A	-	-	B	B	-	-	-	-	-	-
3-12	A	A	A	A	A	A	-	-	A	A	-	-	-	-	-	-
13-15	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
Perform Criterion	B						-		B		-					
Result	A						-		A		-					
Judgment	PASS						-		PASS		-					

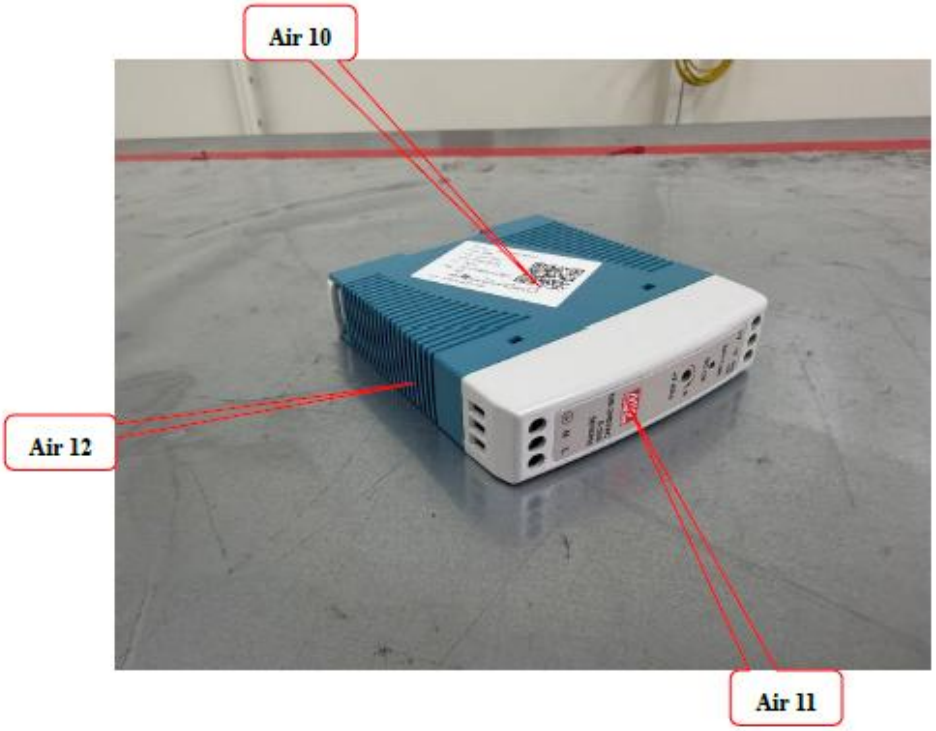
Mode	HCP Discharge								VCP Discharge							
Level	4 kV		-		-		-		4 kV		-		-		-	
Polarity	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1, 2, 3, 4	A	A	-	-	-	-	-	-	A	A	-	-	-	-	-	-
Perform Criterion	B		-						B		-					
Result	A		-						A		-					
Judgment	PASS		-						PASS		-					

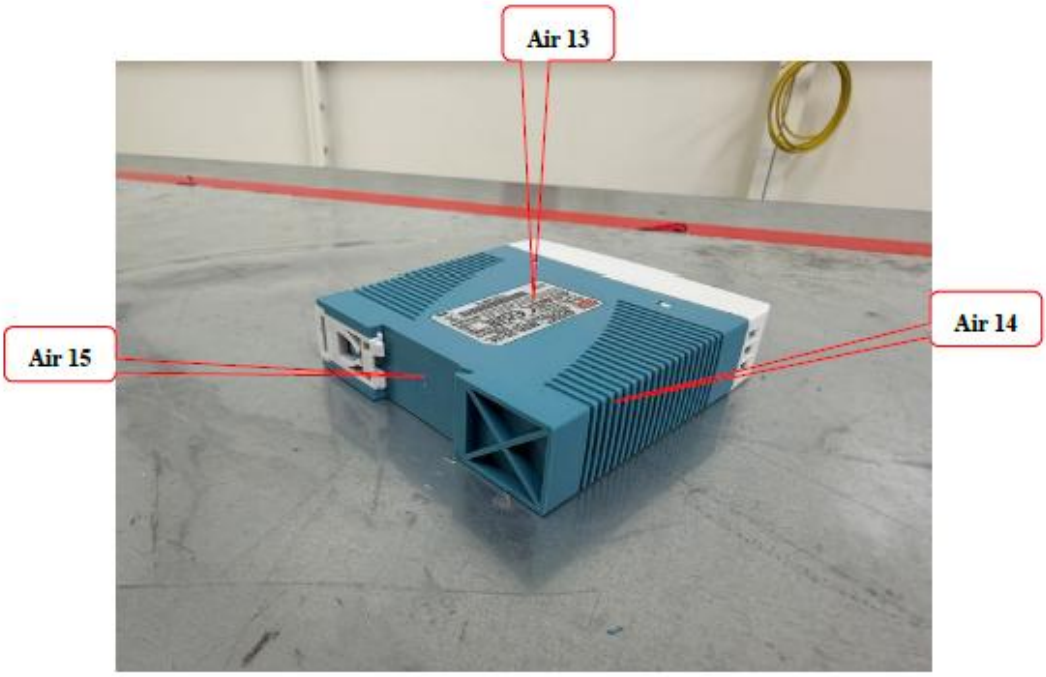
Photo(s) shown the location(s) of ESD evaluated





Photo(s) shown the location(s) of ESD evaluated





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

6.4.1 TEST SPECIFICATION

Reference Standard	EN IEC 61000-4-3 / IEC 61000-4-3
Required Performance Criterion	A
Frequency Range	80 MHz to 1000 MHz 1800 MHz ±1 % MHz, 2600 MHz ±1 % MHz, 3500 MHz ±1 % MHz, 5000 MHz ±1 % MHz
Field Strength	3 V/m (unmodulated, rms)
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	1.15 m
Dwell Time	at least 3 s

6.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	MXG Vector Signal Generator	Keysight	N5182B	MY62220448	2025/7/11	2026/7/10
2	Log. Periodic Antenna	SCHWARZBECK	STLP 9129	03069	N/A	N/A
3	Power Amplifier	TESEQ	CBA 1G-600D	1100877	N/A	N/A
4	Power Amplifier	TESEQ	CBA 6G-200D	1100832	N/A	N/A
5	Power Sensor	TESEQ	PM6006	81121	2025/10/1	2026/9/30
6	Power Sensor	TESEQ	PM6006	81270	2025/10/1	2026/9/30
7	Measurement Software	AUDIX	i2 (Ver. 5.161006)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.4.3 TEST PROCEDURE

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

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

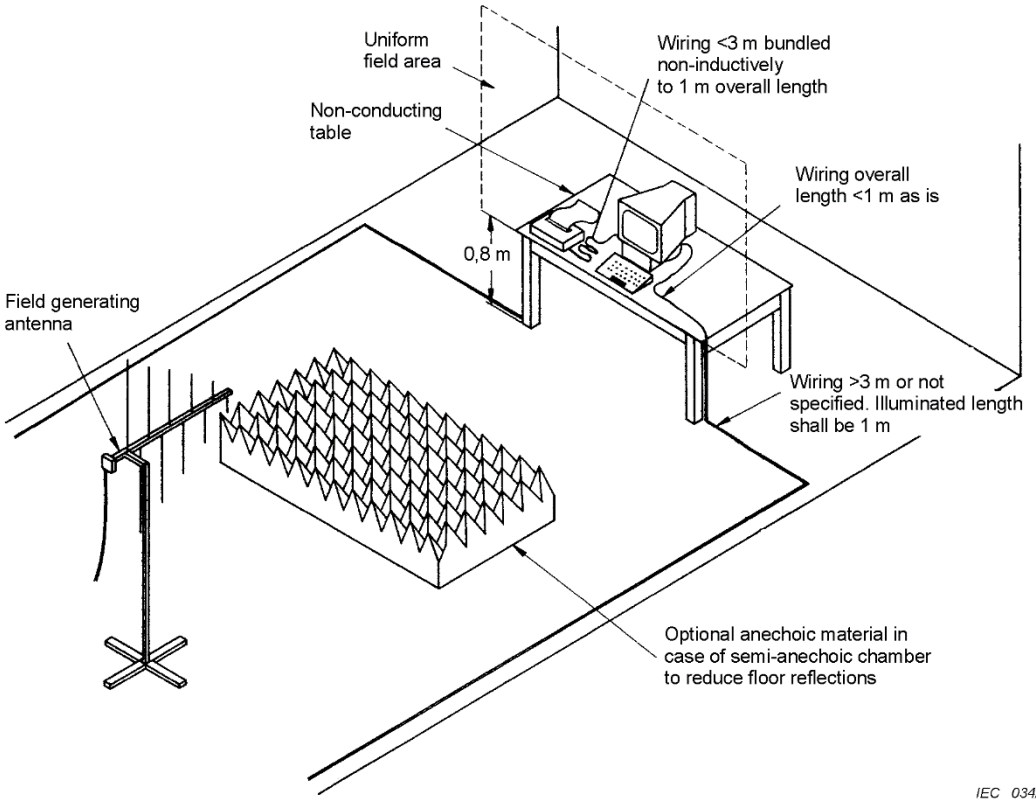
The other condition as following manner:

a. The field strength is 3 V/m (unmodulated, rms).
b. The frequency ranges are swept from 80 MHz to 1000 MHz, 1800 MHz ±1 % MHz, 2600 MHz ±1 % MHz, 3500 MHz ±1 % MHz and 5000 MHz ±1 % MHz with the signal 80 % amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1 % of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

6.4.4 DEVIATION FROM TEST STANDARD

No deviation.

6.4.5 TEST SETUP



6.4.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Frequency (MHz)	Applied Voltage(V/m) – 80% AM 1kHz	Polarity	Azimuth	Criterion	Observation	Result	Remark
80~1000	3	V & H	Rear	A	A	PASS	-
			Front		A		
			Left		A		
			Right		A		
1800±1% 2600±1% 3500±1% 5000±1%	3	V & H	Rear	A	A	PASS	
			Front		A		
			Left		A		
			Right		A		

6.5 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)

6.5.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-4 / IEC 61000-4-4
Required Performance Criterion	B
Test Voltage	AC mains power ports: ±1 kV Analogue/digital data ports: N/A
Polarity	Positive & Negative
Impulse Frequency	Repetition frequency 5 kHz. For xDSL ports repetition frequency is 100 kHz.
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	Not less than 1 minute

6.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Immunity Test System	EMC PARTNER	IMU-MGE	109937-1663	2026/6/22	2027/6/21

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.5.3 TEST PROCEDURE

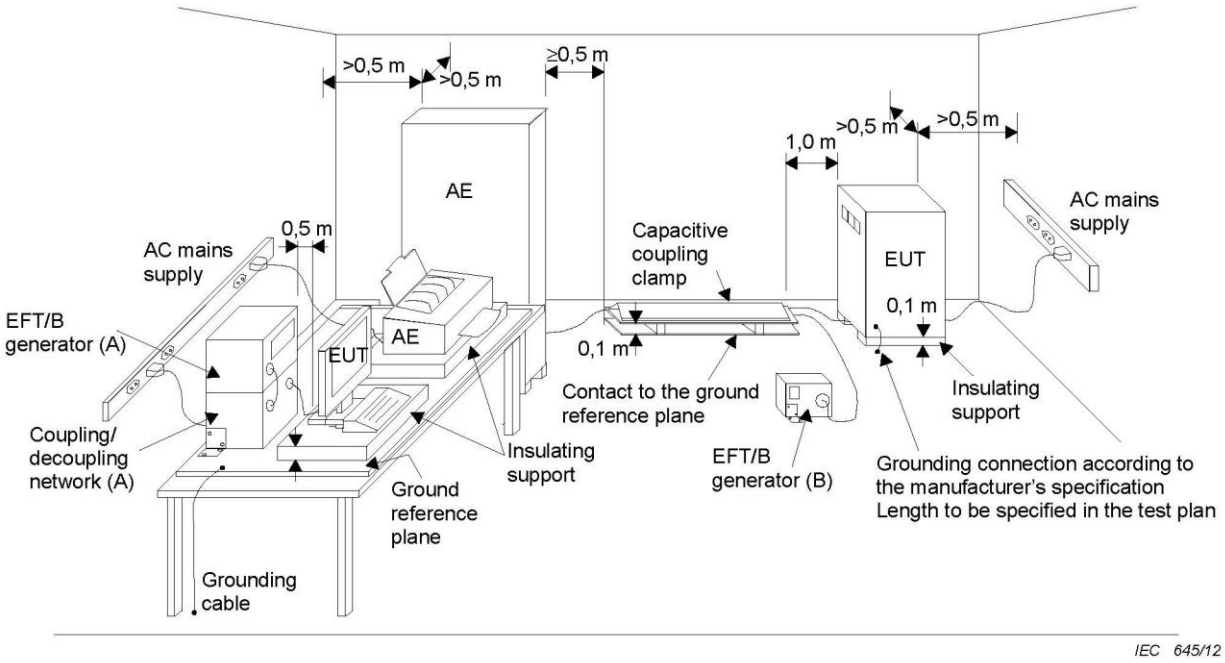
The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m ± 0.01 m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25 mm thick and 2.5 m square) connected to the protective grounding system. A minimum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

The other condition as following manner:
a. Both positive and negative polarity discharges were applied.
b. The duration time of each test sequential was 1 minute

6.5.4 DEVIATION FROM TEST STANDARD

No deviation.

6.5.5 TEST SETUP



(A) location for supply line coupling

(B) location for signal lines coupling

6.5.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Test Date	2026/7/8

AC Power Ports – 5/50 Tr/Th ns						
Tested on	Test Voltage(kV)		Pulse Rate	Criterion	Observation	Result
L	+/-	1	5 kHz	B	A	PASS
N	+/-	1	5 kHz	B	A	
PE	+/-	1	5 kHz	B	A	
L+N+PE	+/-	1	5 kHz	B	A	

6.6 SURGE IMMUNITY TEST

6.6.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-5 / IEC 61000-4-5
Required Performance Criterion	B for AC mains power ports B for DC network power ports B for analogue/digital data ports
Waveform	Combination Wave for power lines 1.2/50 μs Open Circuit Voltage 8 /20 μs Short Circuit Current
Test Voltage	AC mains power ports: ±0.5 kV, ±1 kV, ±2 kV Analogue/digital data ports: N/A (primary protection is not intended)
Generator Source Impedance	2 Ω of the low-voltage power supply network. 12 Ω (10Ω+2Ω) of the low-voltage power supply network and ground. 42 Ω (40Ω+2Ω) between all other lines and ground when use 1.2/50 us waveform.
Phase Angle and Polarity	Five positive pulses line-to-neutral at 90° phase Five negative pulses line-to-neutral at 270° phase Five positive pulses line-to-earth at 90° phase Five negative pulses line-to-earth at 270° phase Five negative pulses neutral-to-earth at 90° phase Five positive pulses neutral-to-earth at 270° phase DC network power ports: N/A Analogue/digital data ports: N/A
Pulse Repetition Rate	1 time / minute (maximum)
Number of Tests	5 positive and 5 negative at selected points

6.6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Immunity Test System	EMC PARTNER	IMU-MGE	109937-1663	2026/6/22	2027/6/21

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.6.3 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 m in length (or shorter).

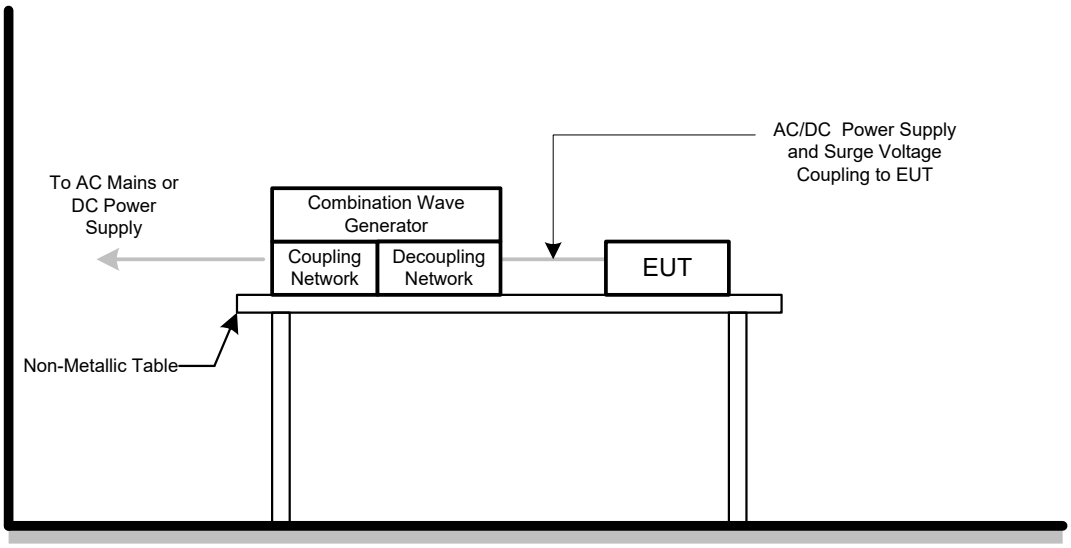
b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 m 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 m in length (or shorter).

6.6.4 DEVIATION FROM TEST STANDARD

No deviation.

6.6.5 TEST SETUP



6.6.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Test Date	2026/7/8

AC Power Ports – 1.2/50(8/20) Tr/Th μs								
Tested on	Polarity	Test Voltage(kV)				Criterion	Observation	Result
		0.5	1	2	4			
L+N	+/-	A	A	-	-	B	A	PASS
L+PE	+/-	A	A	A	-	B	A	
N+PE	+/-	A	A	A	-	B	A	

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

6.7.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-6 / IEC 61000-4-6
Required Performance Criterion	A
Frequency Range & Field Strength	0.15 MHz to 10 MHz, 3 V 10 MHz to 30 MHz, 3 V to 1 V 30 MHz to 80 MHz, 1 V (unmodulated, rms)
Modulation	1 kHz Sine Wave, 80 %, AM Modulation
Frequency Step	1 % of fundamental
Dwell Time	at least 3 s

6.7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Conducted Disturbances Test System	SCHLODER	CDG 7000-75-10	11764-1	2025/9/3	2026/9/2
2	CDN	SCHLODER	CDN-M2+3-32A	11970-1	2025/8/22	2026/8/21
3	Measurement Software	SCHLODER	HELIA 7 (v1.39.330)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.7.3 TEST PROCEDURE

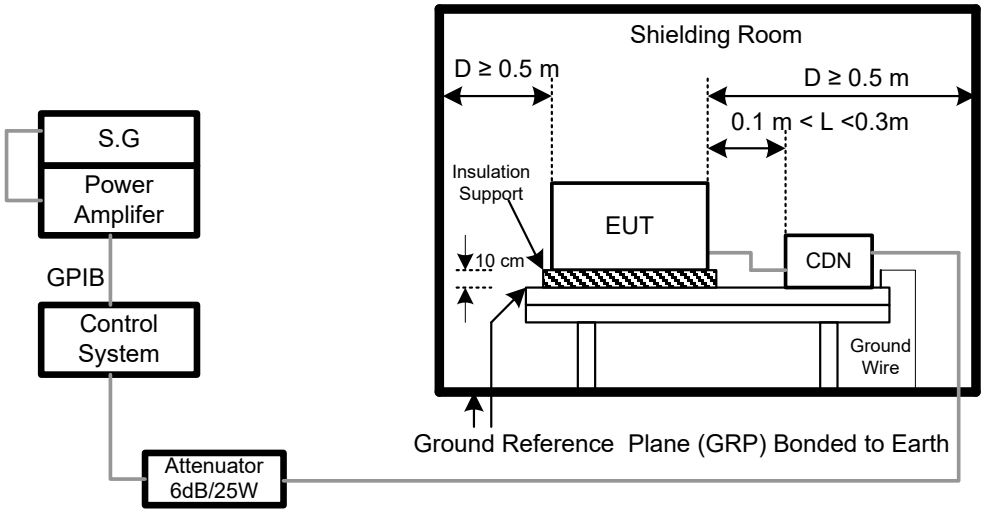
The EUT and support equipment, are placed on a table that is 0.8 m above a metal ground plane measured 1 m x 1 m minimum and 0.65 mm thick minimum.

The other condition as following manner:
a. The field strength is 3 V, 3 V to 1 V, and 1V. The test level specified is the rms voltage level of the unmodulated signal.
b. The frequency range is swept from 0.15 MHz to 80 MHz, with the signal 80 % amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1 % of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

6.7.4 DEVIATION FROM TEST STANDARD

No deviation.

6.7.5 TEST SETUP



6.7.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

AC Power Ports – 80% AM 1kHz						
Tested on	Frequency (MHz)	Applied Voltage (V r.m.s)	Criterion	Observation	Result	Remark
AC	0.15~10	3	A	A	PASS	-
	10~30	3~1				
	30~80	1				

6.8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

6.8.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-8 / IEC 61000-4-8
Required Performance Criterion	A
Frequency Range	50 or 60 Hz
Field Strength	1 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1 m x 1 m

6.8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Magnetic Field Test Generator	SGH	SMFG 8N	254307	2026/1/9	2027/1/8
2	Inductive Coil	SGH	HHS100	254308	2026/1/9	2027/1/8

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

6.8.3 TEST PROCEDURE

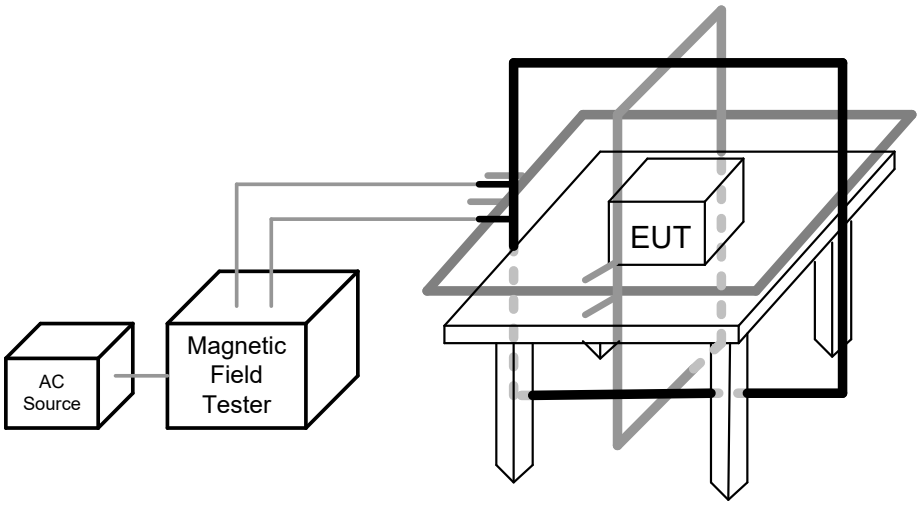
The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

The other condition as following manner:
a. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
b. The cables supplied or recommended by the equipment manufacturer shall be used. 1 m of all cables used shall be exposed to the magnetic field.

6.8.4 DEVIATION FROM TEST STANDARD

No deviation.

6.8.5 TEST SETUP



6.8.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Test Frequency (Hz)	Magnetic Field (A/m)	Direction	Criterion	Observation	Result
50	1	X Y Z	A	A	PASS
60	1	X Y Z	A	A	PASS

6.9 VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

6.9.1 TEST SPECIFICATION

Reference Standard	EN IEC 61000-4-11 / IEC 61000-4-11
Required Performance Criterion	Voltage Dips: Criterion B for Residual voltage <5 %, 0.5 cycles Criterion C for Residual voltage 70 %, 25 cycles for 50 Hz, 30 cycles for 60 Hz Voltage Interruptions: Criterion C for Residual voltage <5 %, 250 cycles for 50 Hz, 300 cycles for 60 Hz
Test Duration Time	Minimum three test events in sequence
Interval between Event	10 s minimum
Phase Angle	0°/180°
Test Cycle	3 times

6.9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Compliance Test System	APS	ECTS2-3600F-C	550211	2025/8/26	2026/8/25
2	Measurement Software	APS	EptsGui(v1.0.5.0)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

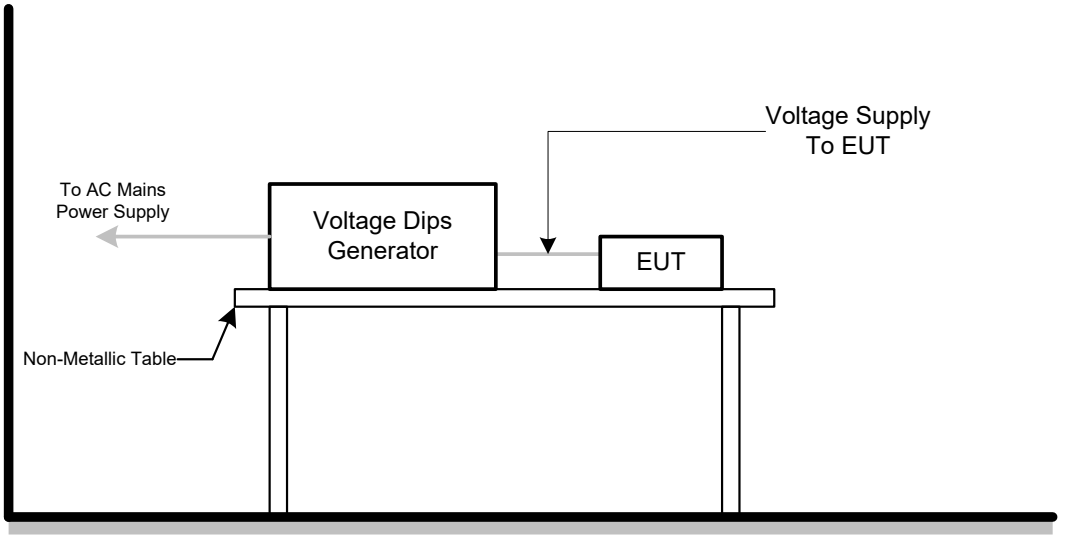
6.9.3 TEST PROCEDURE

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.

6.9.4 DEVIATION FROM TEST STANDARD

No deviation.

6.9.5 TEST SETUP



6.9.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	Refer to below data.	Tested Date	2026/7/8
Situation	C: EUT shutdown during testing, need manual recover after the test.		

100 Vac, 50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	25	C	C	
>95%	250	C	C	

230 Vac, 50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	25	C	C	
>95%	250	C	C	

240 Vac, 50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	25	C	C	
>95%	250	C	C	

100 Vac, 60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	30	C	C	
>95%	300	C	C	

230 Vac, 60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	30	C	C	
>95%	300	C	C	

240 Vac, 60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
>95%	0.5	B	A	PASS
30%	30	C	C	
>95%	300	C	C	

7 IMMUNITY TEST - EN IEC 61000-6-2

7.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERION

Environmental phenomenon and Reference Standard	Test Specification	Test Ports	Performance Criteria
Electrostatic discharge EN 61000-4-2 IEC 61000-4-2 (ESD)	±8 kV air discharge ±4 kV contact discharge	Enclosure ports (Direct Mode)	B
	±4 kV HCP discharge ±4 kV VCP discharge	Enclosure ports (Indirect Mode)	B
Radio-frequency electromagnetic field. Amplitude modulated EN IEC 61000-4-3 IEC 61000-4-3 (RS)	80 MHz to 1000 MHz 10 V/m (unmodulated, rms) 80 % AM (1 kHz)	Enclosure ports	A
	1.4 GHz to 6.0 GHz 3 V/m (unmodulated, rms) 80 % AM (1 kHz)		A
Fast transients EN 61000-4-4 IEC 61000-4-4 (EFT/BURST)	±1 kV 5/50 t_r/t_w ns Repetition frequency 5 or 100 kHz	Signal/control ports **NOTE (1)(5)**	B
	±1 kV 5/50 t_r/t_w ns Repetition frequency 5 or 100 kHz	Input and output DC power ports **NOTE (5)(6)(10)(11)**	B
	±2 kV 5/50 t_r/t_w ns Repetition frequency 5 or 100 kHz	Input and output AC power ports **NOTE (5)**	B
Surges EN 61000-4-5 IEC 61000-4-5	1.2/50 (8/20) T_r/T_d µs (open circuit test voltage) Line-to-earth: ±1 kV	Signal/control ports **NOTE (2)(3)(4)**	B
	1.2/50 (8/20) T_r/T_d µs (open circuit test voltage) Line-to-earth: ±1 kV Line-to-line: ±0.5 kV	Input and output DC power ports **NOTE (6)(7)(8)(9)**	B
	1.2/50 (8/20) T_r/T_d µs (open circuit test voltage) Line-to-earth: ±2 kV Line-to-line: ±1 kV	Input and output AC power ports **NOTE (8)**	B
Radio-frequency common mode EN 61000-4-6 IEC 61000-4-6 (CS)	0.15 MHz to 80 MHz 10 V (unmodulated, rms) 80 % AM (1 kHz)	Signal/control ports **NOTE (1)**	A
	0.15 MHz to 80 MHz 10 V (unmodulated, rms) 80 % AM (1 kHz)	Input and output DC power ports **NOTE (6)**	A
	0.15 MHz to 80 MHz 10 V (unmodulated, rms) 80 % AM (1 kHz)	Input and output AC power ports	A
Power-frequency magnetic field EN 61000-4-8 IEC 61000-4-8 (PFMF)	50, 60 Hz 30 A/m	Enclosure ports	A
Voltage dips and Voltage interruptions EN IEC 61000-4-11 IEC 61000-4-11	Voltage Dips: 0 % residual – 1 cycle 40 % residual – 10/12 cycles at 50/60Hz 70 % residual – 25/30 cycles at 50/60Hz Voltage Interruptions: 0 % residual – 250/300 cycles at 50/60Hz	Input and output AC power ports **NOTE (12)(13)**	B **NOTE (14)** C C C

NOTE:
(1) Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.
(2) Applicable only to ports interfacing with long distance lines
(3) Where normal functioning cannot be achieved because of the impact of the coupling/decoupling network (CDN) on the EUT, the test shall be done with the reduced functionality. A rationale shall be given in the test report for doing so. After the test and the removal of the CDN, the normal function shall not be affected.
(4) Signal ports directly connected to AC power network shall be treated as AC power ports.
(5) The test may be performed at one or at both repetition frequencies. The use of 5 kHz repetition frequency is traditional; however, 100 kHz is closer to reality.
(6) DC ports which are not intended to be connected to a DC distribution network shall be tested as signal ports.
(7) Applicable only to ports interfacing with long distance lines; not applicable to input ports intended for connection to a battery or a rechargeable battery which shall be removed or disconnected from the equipment for recharging.
(8) For supply voltages where no test equipment is commercially available (e.g. CDNs), this test is not required.
(9) Equipment with a DC power input port intended for use with an AC–DC power adaptor shall be tested on the AC power input of the AC–DC power adaptor specified by the manufacturer or, where no adaptor is specified, the test shall be done on the DC power port using the test levels of this table.
(10) Not applicable to input ports intended for connection to a battery or a rechargeable battery which shall be removed or disconnected from the equipment for recharging.
(11) Equipment with a DC power input port intended for use with a dedicated AC–DC power adaptor shall be tested on the AC power input of the AC–DC power adaptor specified by the manufacturer. Where no adaptor is specified, the test shall be done on the DC power port using the test level of Table 4 (EN IEC 61000-6-2). Where an adaptor is specified, the test is applicable to DC power input ports only when intended to be connected permanently to cables longer than 3 m.
(12) Applicable only to input ports.
(13) The test shall be carried out at the frequencies appropriate to the power supply frequency. Equipment intended to be used in regions where only one of these frequencies is applied needs to be tested at this specific frequency only.
(14) For electronic power converters, the operation of protective devices (e.g. undervoltage protection) and the performance criterion C are allowed.

7.2 PERFORMANCE CRITERIA

According to EN IEC 61000-6-2 standard, the performance criteria as following:

A functional description and a definition of specific performance criteria, during or as a consequence of immunity testing of equipment under test (EUT), shall be provided by the manufacturer and noted in the test report. They shall be consistent with one of the following general criteria for each test:

a) Performance criterion A: The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

b) Performance criterion B: The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

c) Performance criterion C: Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

If, as a result of the application of the tests defined in this standard, the EUT becomes dangerous or unsafe, it shall be deemed to have failed the test.

7.3 ELECTROSTATIC DISCHARGE TEST (ESD)

7.3.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-2 / IEC 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Required Performance Criterion	B
Discharge Voltage	Air Discharge: ±2 kV, ±4 kV, ±8 kV Contact Discharge: ±4 kV
Polarity	Positive & Negative
Number of Discharge	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 times in total
Discharge Mode	Single Discharge
Discharge Period	1 s minimum

7.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	ESD Simulator	AMETEK	NSG437-04 ESD GERATOR US	P2540303799	2025/11/14	2026/11/13
2	Temperature/Relative Humidity Data Logger	HOBO	MX1101	21590145	2025/9/3	2026/9/2

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

7.3.3 TEST PROCEDURE

The configuration consisted of a wooden table 0.8 m high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25 mm thick, and 2.5 m square connected to the protective grounding system. A Horizontal Coupling Plane (1.6 m x 0.8 m) 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 EN 61000-4-2 / IEC 61000-4-, and its cables were placed on the HCP and isolated by an insulating support of 0.5 mm thickness. A distance of 1 m minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

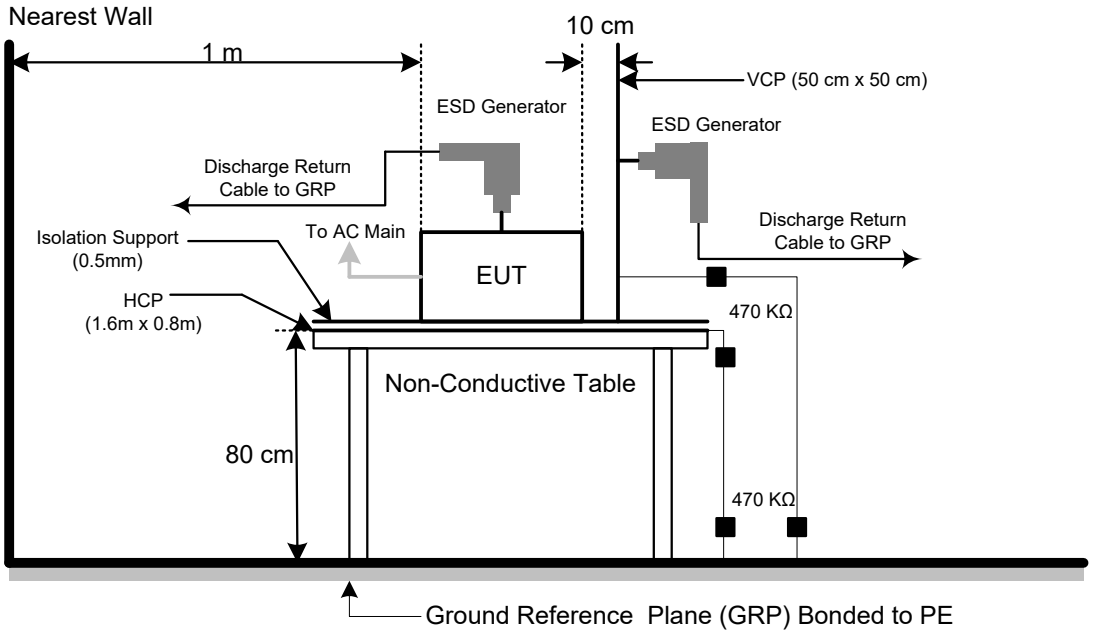
a. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied.
NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges 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 0.5 m x 0.5 m, is placed parallel to, and positioned at a distance 0.1 m 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 0.1 m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

7.3.4 DEVIATION FROM TEST STANDARD

No deviation.

7.3.5 TEST SETUP



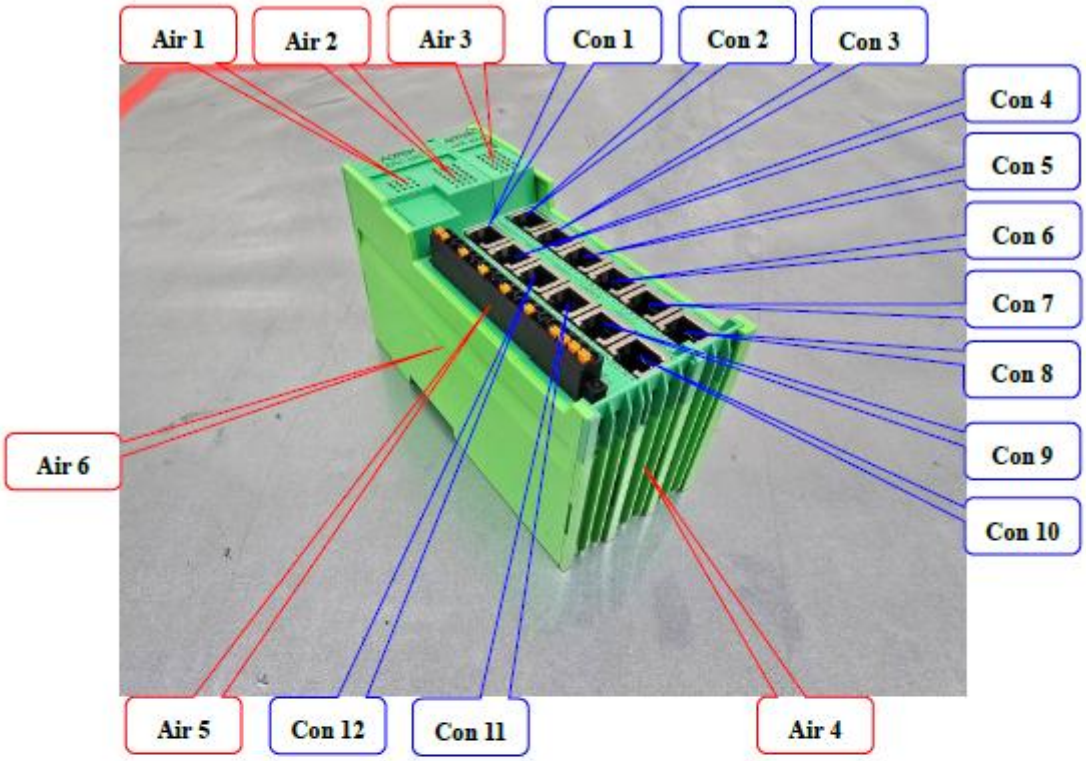
7.3.6 TEST RESULT

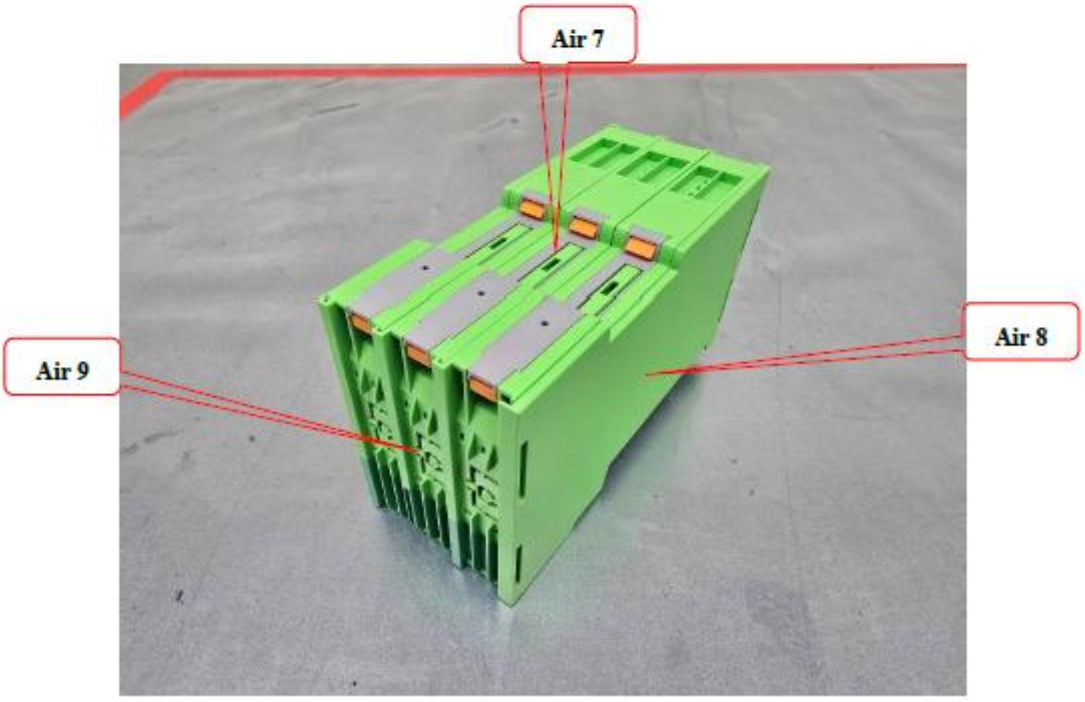
Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8
Situation	B: The indicator light turns off and will recover automatically after the test.		

Mode	Air Discharge								Contact Discharge							
Level	2 kV		4 kV		8 kV		-		4 kV		-		-		-	
Polarity	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1-2	A	A	A	A	A	A	-	-	B	B	-	-	-	-	-	-
3-12	A	A	A	A	A	A	-	-	A	A	-	-	-	-	-	-
13-15	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
Perform Criterion	B						-		B		-					
Result	A						-		A		-					
Judgment	PASS						-		PASS		-					

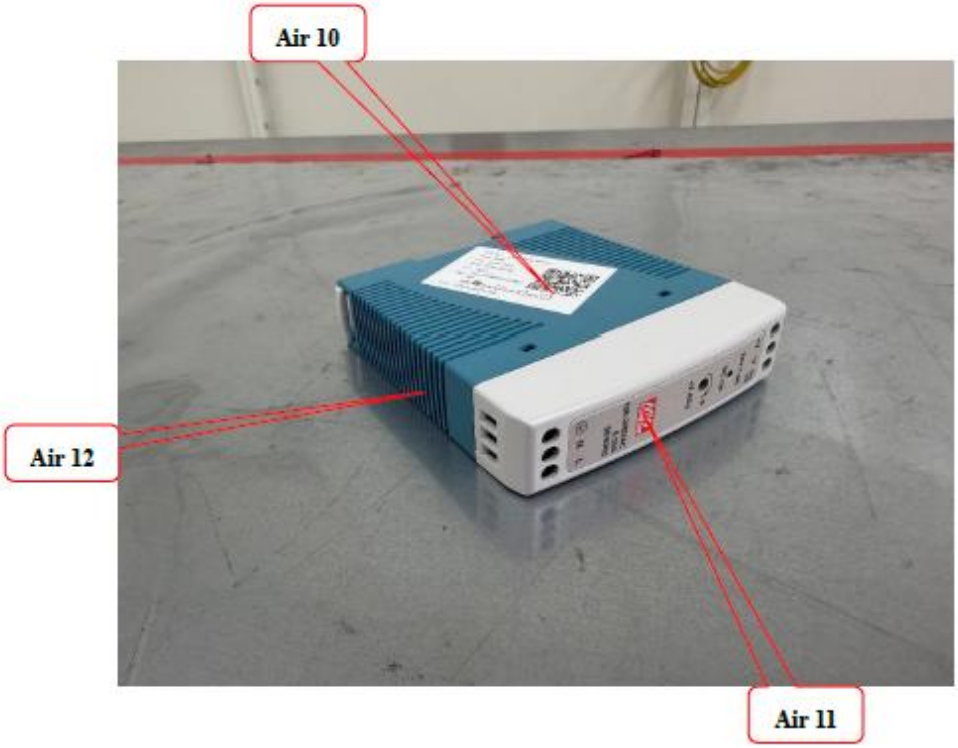
Mode	HCP Discharge								VCP Discharge							
Level	4 kV		-		-		-		4 kV		-		-		-	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1, 2, 3, 4	A	A	-	-	-	-	-	-	A	A	-	-	-	-	-	-
Perform Criterion	B		-						B		-					
Result	A		-						A		-					
Judgment	PASS		-						PASS		-					

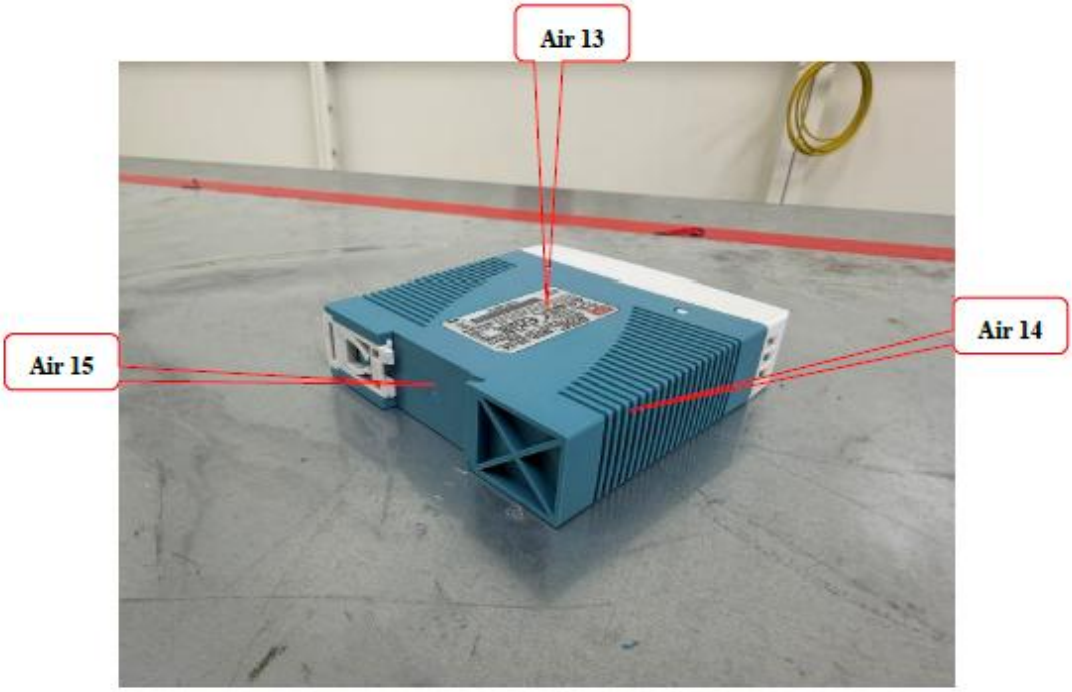
Photo(s) shown the location(s) of ESD evaluated





Photo(s) shown the location(s) of ESD evaluated





7.4 RADIO-FREQUENCY ELECTROMAGNETIC FIELD. AMPLITUDE MODULATED TEST (RS)

7.4.1 TEST SPECIFICATION

Reference Standard	EN IEC 61000-4-3 / IEC 61000-4-3
Required Performance Criterion	A
Frequency Range	80 MHz to 1000 MHz 1.4 GHz to 6.0 GHz
Field Strength	10 V/m, 3 V/m (unmodulated, rms)
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	1.15 m
Dwell Time	at least 3 s

7.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	MXG Vector Signal Generator	Keysight	N5182B	MY62220448	2025/7/11	2026/7/10
2	Log. Periodic Antenna	SCHWARZBECK	STLP 9129	03069	N/A	N/A
3	Power Amplifier	TESEQ	CBA 1G-600D	1100877	N/A	N/A
4	Power Amplifier	TESEQ	CBA 6G-200D	1100832	N/A	N/A
6	Power Sensor	TESEQ	PM6006	81121	2025/10/1	2026/9/30
7	Power Sensor	TESEQ	PM6006	81270	2025/10/1	2026/9/30
8	Measurement Software	AUDIX	i2 (Ver. 5.161006)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

7.4.3 TEST PROCEDURE

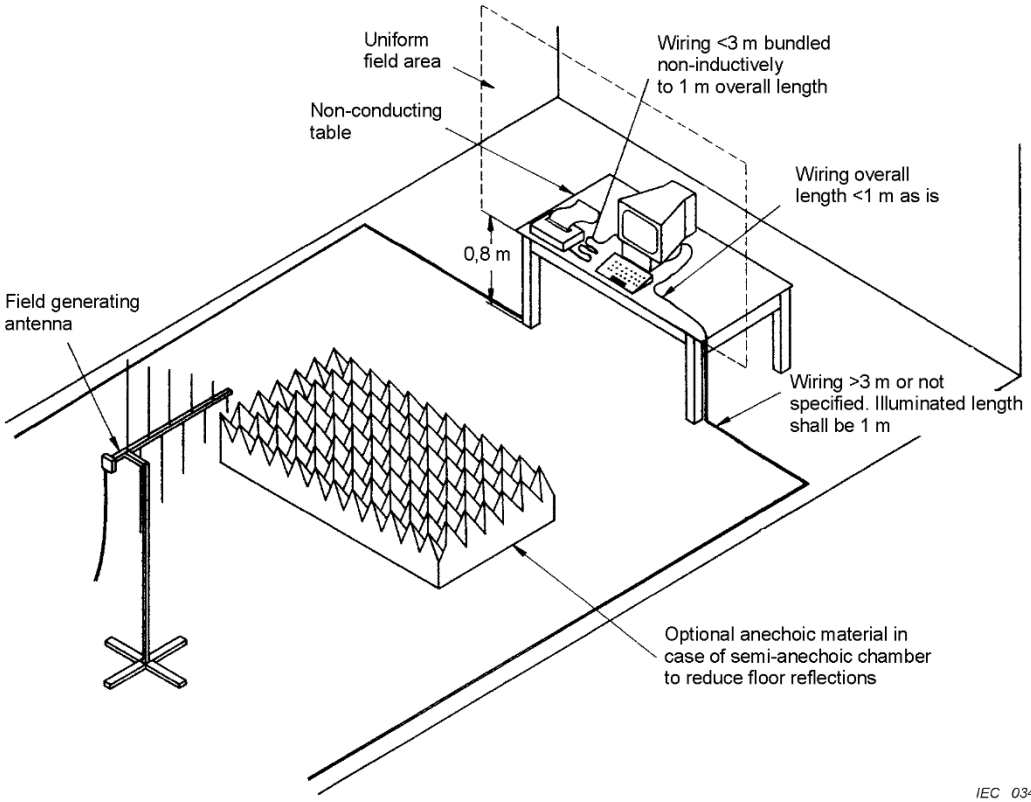
The testing distance from antenna to the EUT was 3 m.
The EUT and support equipment are installed in a representative system as described in EN IEC 61000-4-3 was placed on a non-conductive table 0.8 m in height. The system under test was connected to the power and signal wire according to relevant installation instructions.
The other condition as following manner:

a. The field strength is 10 V/m, 3 V/m (unmodulated, rms).
b. The frequency range is swept from 80 MHz to 1000 MHz and 1.4 GHz to 6.0 GHz with the signal 80 % amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1 % of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

7.4.4 DEVIATION FROM TEST STANDARD

No deviation.

7.4.5 TEST SETUP



7.4.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Frequency (MHz)	Applied Voltage(V/m) – 80% AM 1kHz	Polarity	Azimuth	Criterion	Observation	Result
80~1000	10	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	
1400~6000	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	

7.5 FAST TRANSIENTS TEST (EFT/BURST)

7.5.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-4 / IEC 61000-4-4
Required Performance Criterion	B
Test Voltage	Input and output AC power ports: ±2 kV
Polarity	Positive & Negative
Impulse Frequency	Repetition frequency 5 kHz
Impulse Wave shape	5/50 t_r/t_w ns
Burst Duration	15 ms or 0.75ms
Burst Period	300 ms
Test Duration	Not less than 1 minute

7.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Immunity Test System	EMC PARTNER	IMU-MGE	109937-1663	2026/6/22	2027/6/21

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

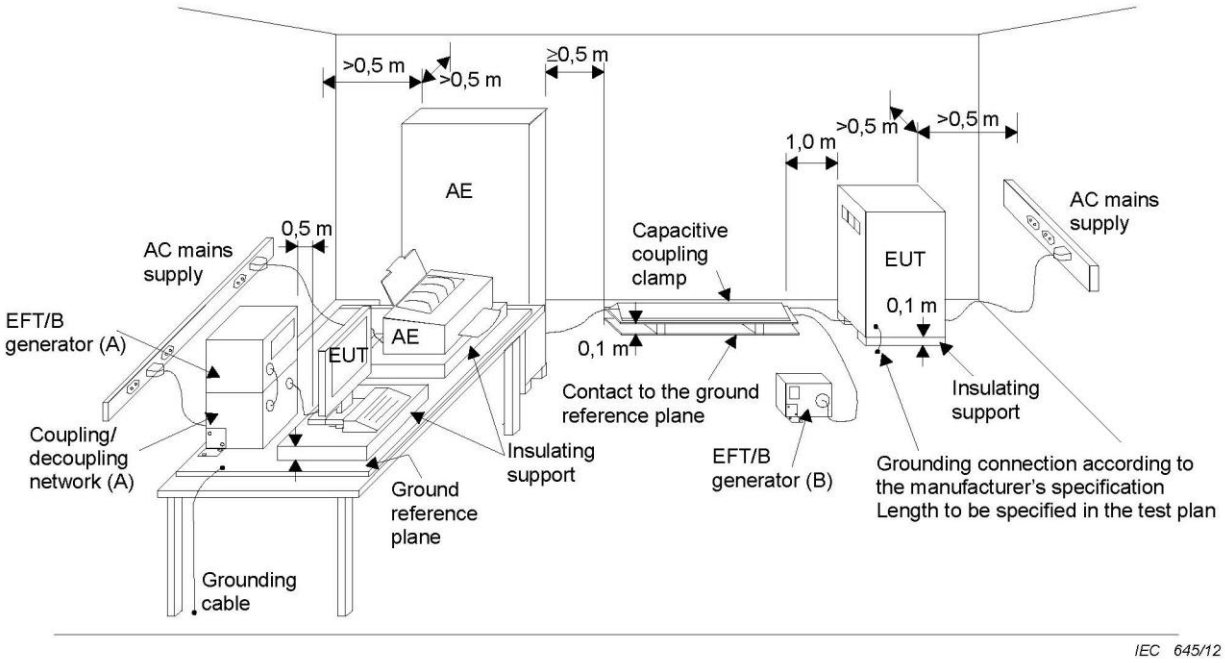
7.5.3 TEST PROCEDURE

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m ± 0.01 m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25 mm thick and 2.5 m square) connected to the protective grounding system. A minimum distance of 0.5 m was provided between the EUT and the walls of the laboratory or any other metallic structure.
The other condition as following manner:
a. The length of power cord between the coupling device and the EUT should not exceed 1 m.
b. Both positive and negative polarity discharges were applied.
c. The duration time of each test sequential was 1 minute.

7.5.4 DEVIATION FROM TEST STANDARD

No deviation.

7.5.5 TEST SETUP



(A) location for supply line coupling

(B) location for signal lines coupling

7.5.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

AC Power Ports –5/50Tr/Th ns						
Tested on	Test Voltage(kV)		Pulse Rate	Criterion	Observation	Result
L	+/-	2	5 kHz	B	A	PASS
N	+/-	2	5 kHz	B	A	
PE	+/-	2	5 kHz	B	A	
L+N+PE	+/-	2	5 kHz	B	A	

7.6 SURGES TEST

7.6.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-5 / IEC 61000-4-5
Required Performance Criterion	B
Waveform	1.2/50 (8/20) T_r/T_d μs
Test Voltage	Input and output AC power ports: ±0.5 kV, ±1 kV, ±2 kV (open circuit test voltage) Signal/control ports: N/A
Generator Source Impedance	2 Ω between line-to-line of a.c./d.c. lines. 12 Ω between line-to-ground of a.c./d.c. lines. 40 Ω (15Ω+25Ω) b between lines-to-ground of unshielded symmetrical interconnection lines when use 10/700 us waveform.
Polarity	Positive/Negative
Phase Angle	AC Port: 0˚/90˚/180˚/270˚ DC Port: N/A Signal Port: N/A
Pulse Repetition Rate	1 time / minute (maximum)
Number of Tests	5 positive and 5 negative at selected points

7.6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Immunity Test System	EMC PARTNER	IMU-MGE	109937-1663	2026/6/22	2027/6/21

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

7.6.3 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 m in length (or shorter).

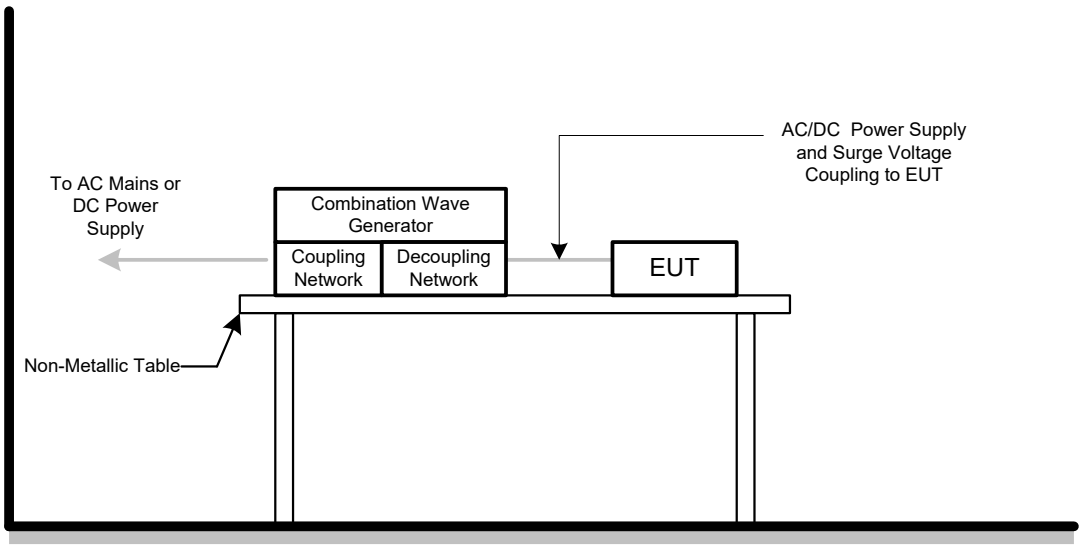
b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 m 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 m in length (or shorter).

7.6.4 DEVIATION FROM TEST STANDARD

No deviation.

7.6.5 TEST SETUP



7.6.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Test Result for AC Power – 1.2/50(8/20) Tr/Th μs								
Tested on	Polarity	Test Voltage(kV)				Criterion	Observation	Result
		0.5	1	2	4			
L+N	+/-	A	A	-	-	B	A	PASS
L+PE	+/-	A	A	A	-	B	A	
N+PE	+/-	A	A	A	-	B	A	

7.7 RADIO-FREQUENCY COMMON MODE TEST (CS)

7.7.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-6 / IEC 61000-4-6
Required Performance Criterion	A
Frequency Range	0.15 MHz to 80 MHz
Field Strength	10 V (unmodulated, rms)
Modulation	1 kHz Sine Wave, 80 %, AM Modulation
Frequency Step	1 % of fundamental
Dwell Time	at least 3 s

7.7.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Conducted Disturbances Test System	SCHLODER	CDG 7000-75-10	11764-1	2025/9/3	2026/9/2
2	CDN	SCHLODER	CDN-M2+3-32A	11970-1	2025/8/22	2026/8/21
3	Measurement Software	SCHLODER	HELIA 7 (v1.39.330)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

7.7.3 TEST PROCEDURE

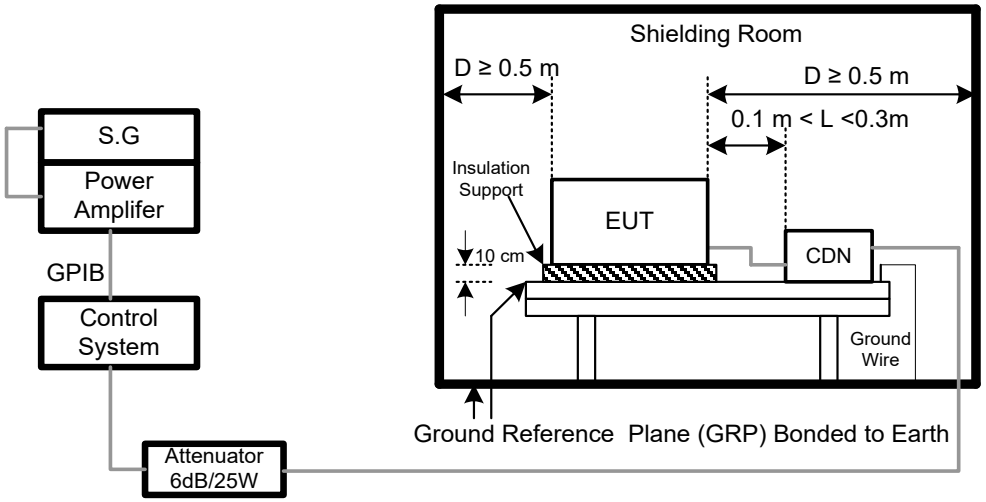
The EUT and support equipment, are placed on a table that is 0.8 m above a metal ground plane measured 1 m x 1 m minimum and 0.65 mm thick minimum.
The other condition as following manner:

a. The field strength is 10 V (unmodulated, rms).
b. The frequency range is swept from 0.15 MHz to 80 MHz, with the signal 80 % amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1 % of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

7.7.4 DEVIATION FROM TEST STANDARD

No deviation.

7.7.5 TEST SETUP



7.7.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Test Result for Power – 80% AM 1kHz					
Tested on	Frequency (MHz)	Applied Voltage (V r.m.s)	Criterion	Observation	Result
AC	0.15~80	10	A	A	PASS

7.8 POWER-FREQUENCY MAGNETIC FIELD TEST (PFMF)

7.8.1 TEST SPECIFICATION

Reference Standard	EN 61000-4-8 / IEC 61000-4-8
Required Performance Criterion	A
Frequency Range	50, 60 Hz
Field Strength	30 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1 m x 1 m

7.8.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Magnetic Field Test Generator	SGH	SMFG 8N	254307	2026/1/9	2027/1/8
2	Inductive Coil	SGH	HHS100	254308	2026/1/9	2027/1/8

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

7.8.3 TEST PROCEDURE

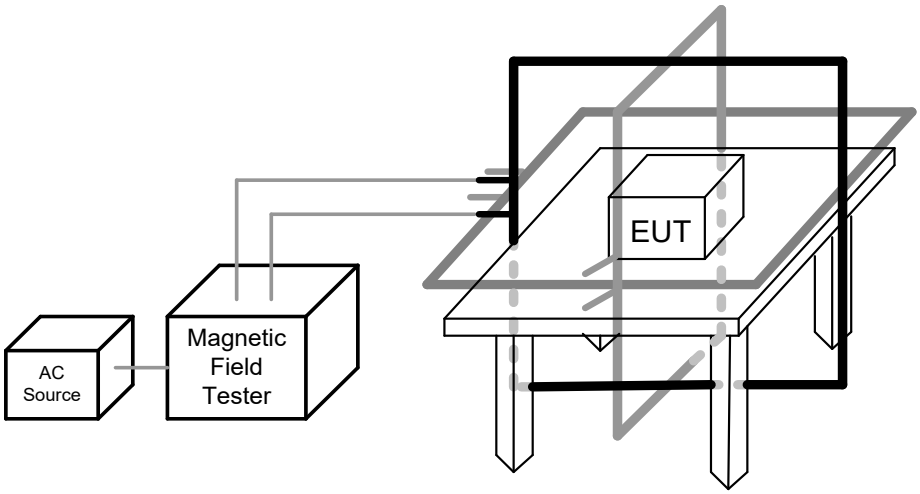
The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.
The other condition as following manner:

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

7.8.4 DEVIATION FROM TEST STANDARD

No deviation.

7.8.5 TEST SETUP



7.8.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	AC 230V/50Hz	Tested Date	2026/7/8

Test Frequency (Hz)	Magnetic Field (A/m)	Direction	Criterion	Observation	Result
50	30	X Y Z	A	A	PASS
60	30	X Y Z	A	A	PASS

7.9 VOLTAGE DIPS AND VOLTAGE INTERRUPTIONS TEST

7.9.1 TEST SPECIFICATION

Reference Standard	EN IEC 61000-4-11 / IEC 61000-4-11
Required Performance Criterion	Voltage Dips: Criterion B for 0 % residual – 1 cycle Criterion C for 40 % residual – 10/12 cycles at 50/60Hz Criterion C for 70 % residual – 25/30 cycles at 50/60Hz Voltage Interruptions: Criterion C for 0 % residual – 250/300 cycles at 50/60Hz
Test Duration Time	Minimum three test events in sequence
Interval between Event	10 s minimum
Phase Angle	0°/180°
Test Cycle	3 times

7.9.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	EMC Compliance Test System	APS	ECTS2-3600F-C	550211	2025/8/26	2026/8/25
2	Measurement Software	APS	EptsGui(v1.0.5.0)	N/A	N/A	N/A

REMARK:
(1) “N/A” denotes no model name, no serial no. or no calibration specified.
(2) All calibration period of equipment list is one year.

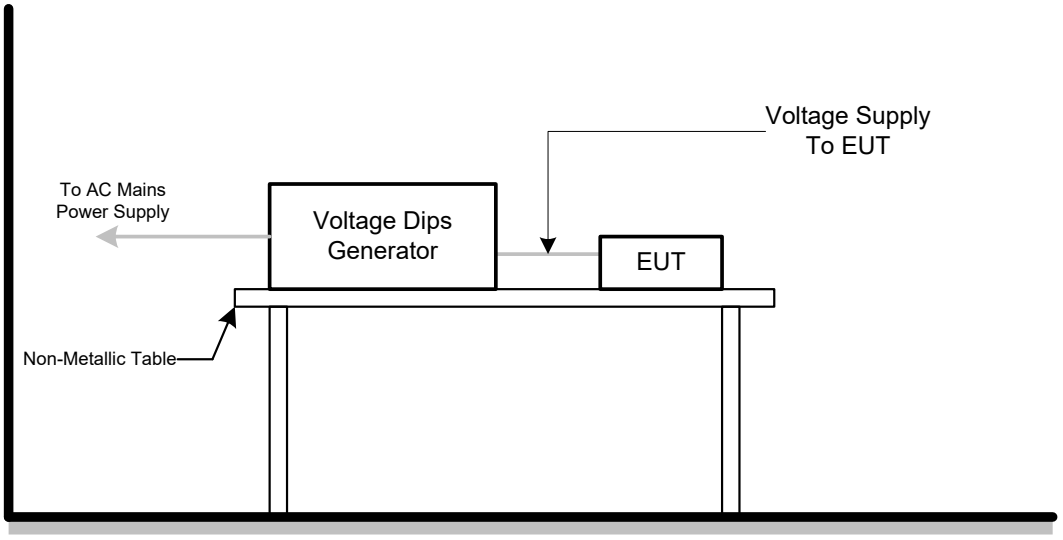
7.9.3 TEST PROCEDURE

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.

7.9.4 DEVIATION FROM TEST STANDARD

No deviation.

7.9.5 TEST SETUP



7.9.6 TEST RESULT

Test Mode	Mode 1		
Test Voltage	Refer to below data.	Tested Date	2026/7/8
Situation:	C: EUT shutdown during testing, need manual recover after the test.		

100Vac/50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	25	C	C	
60%	10	C	C	
100%	250	C	C	

230Vac/50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	25	C	C	
60%	10	C	C	
100%	250	C	C	

240Vac/50Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	25	C	C	
60%	10	C	C	
100%	250	C	C	

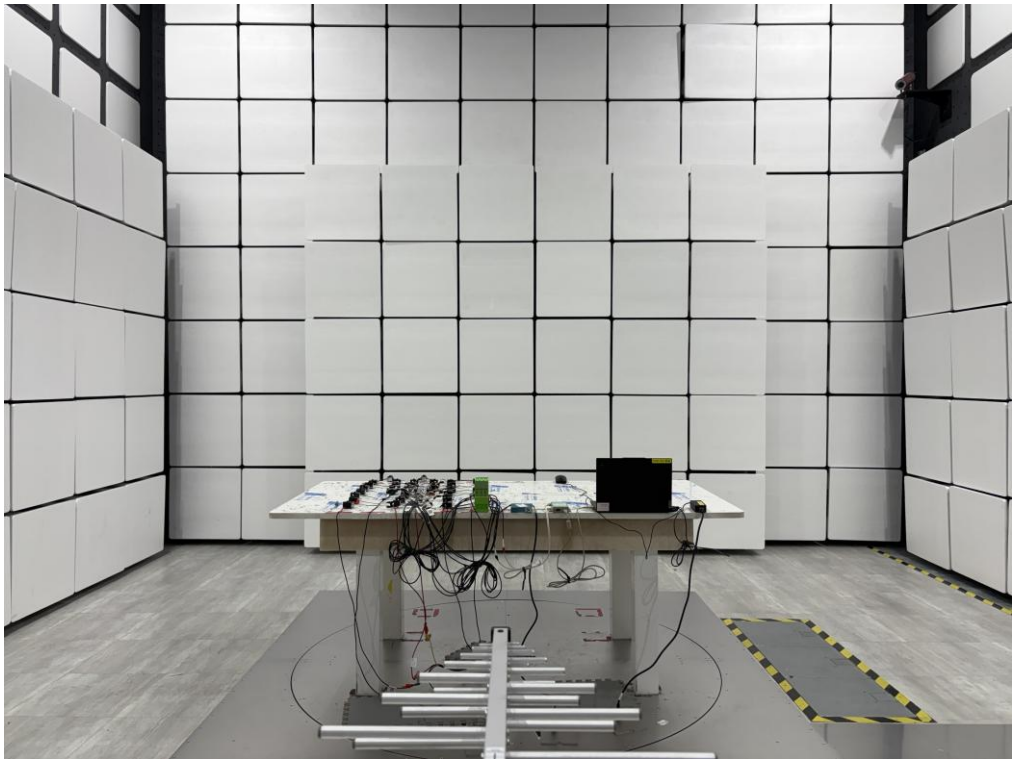
100Vac/60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	30	C	C	
60%	12	C	C	
100%	300	C	C	

230Vac/60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	30	C	C	
60%	12	C	C	
100%	300	C	C	

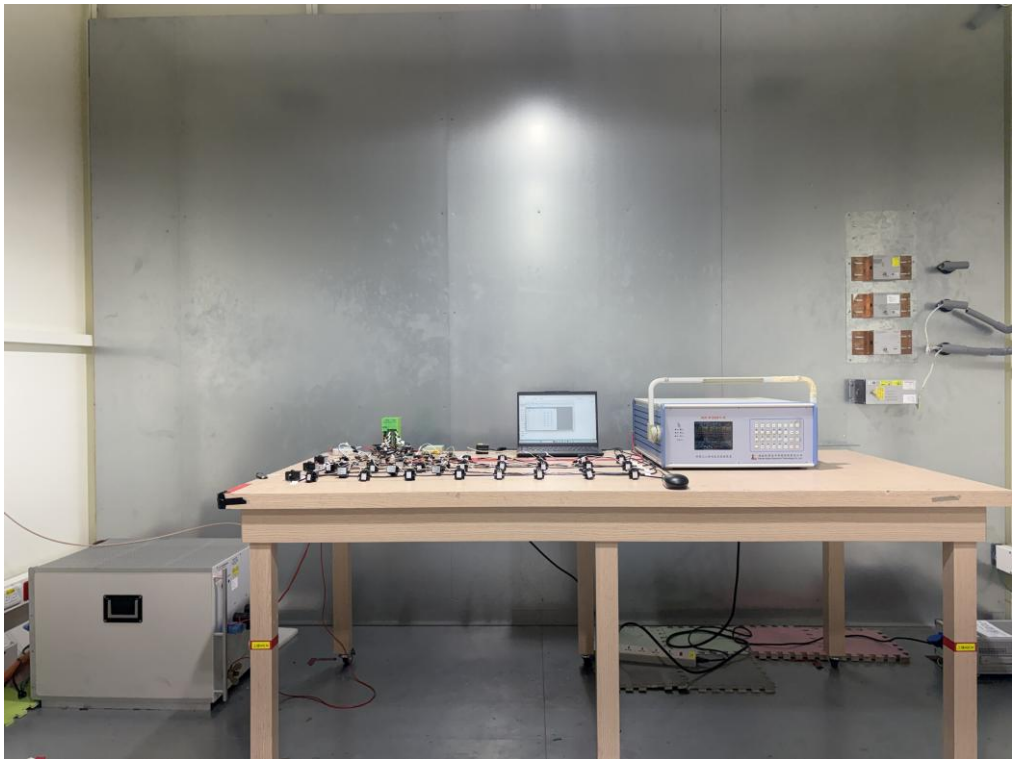
240Vac/60Hz				
Voltage Reduction	Periods	Criterion	Observation	Result
100%	1	B	A	PASS
30%	30	C	C	
60%	12	C	C	
100%	300	C	C	

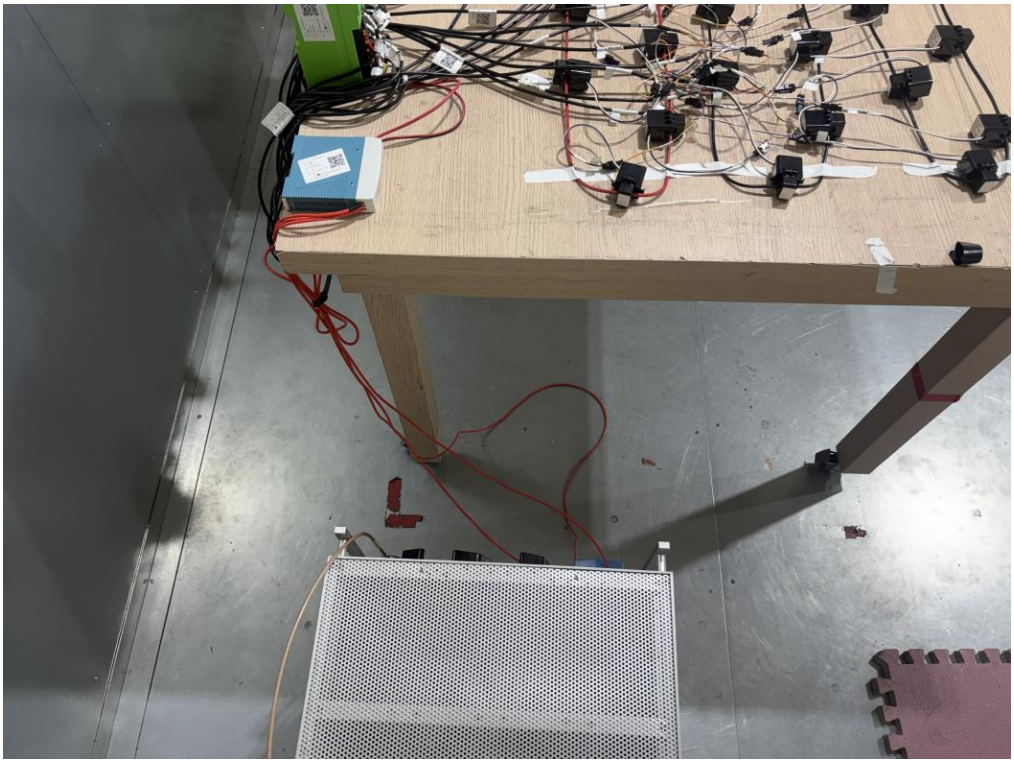
8 TEST PHOTOS

EN 55032
Radiated emissions up to 1 GHz test photos

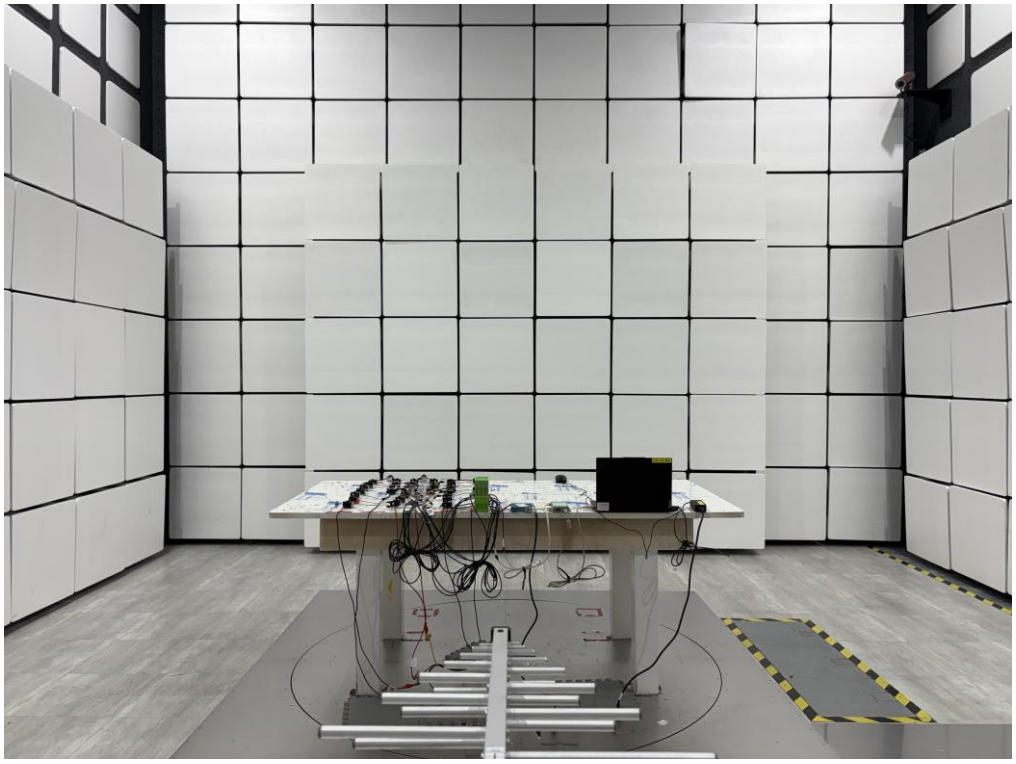


Conducted emissions AC mains power port test photos

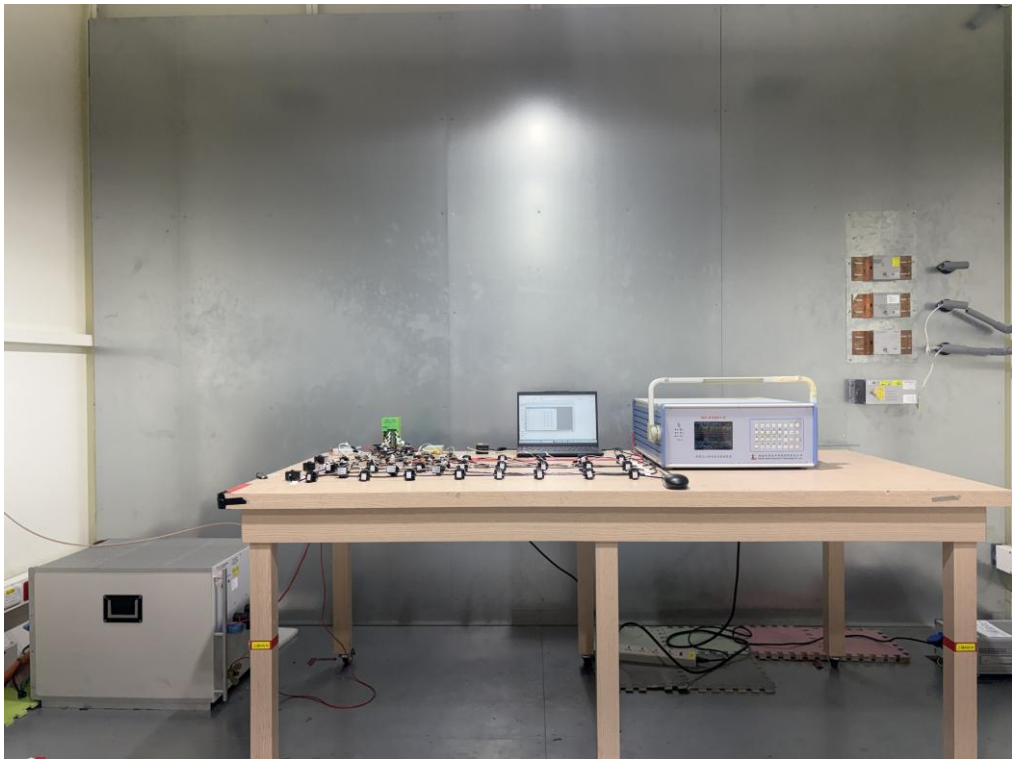


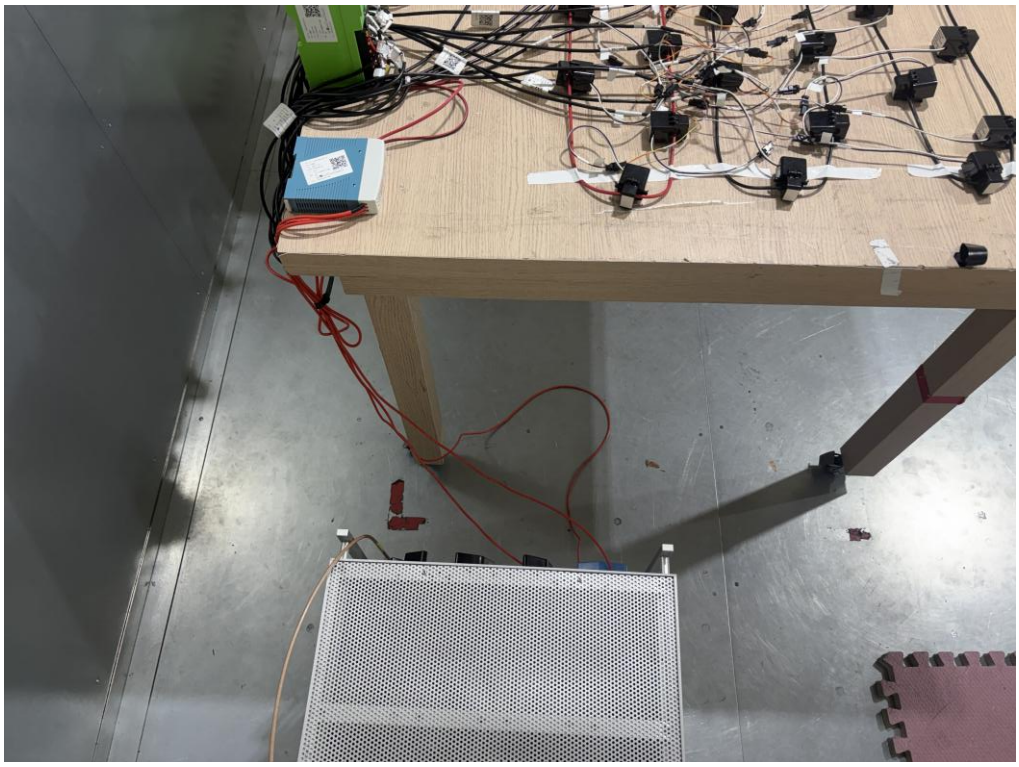


EN IEC 61000-6-4
Enclosure port (Below 1 GHz) test photos



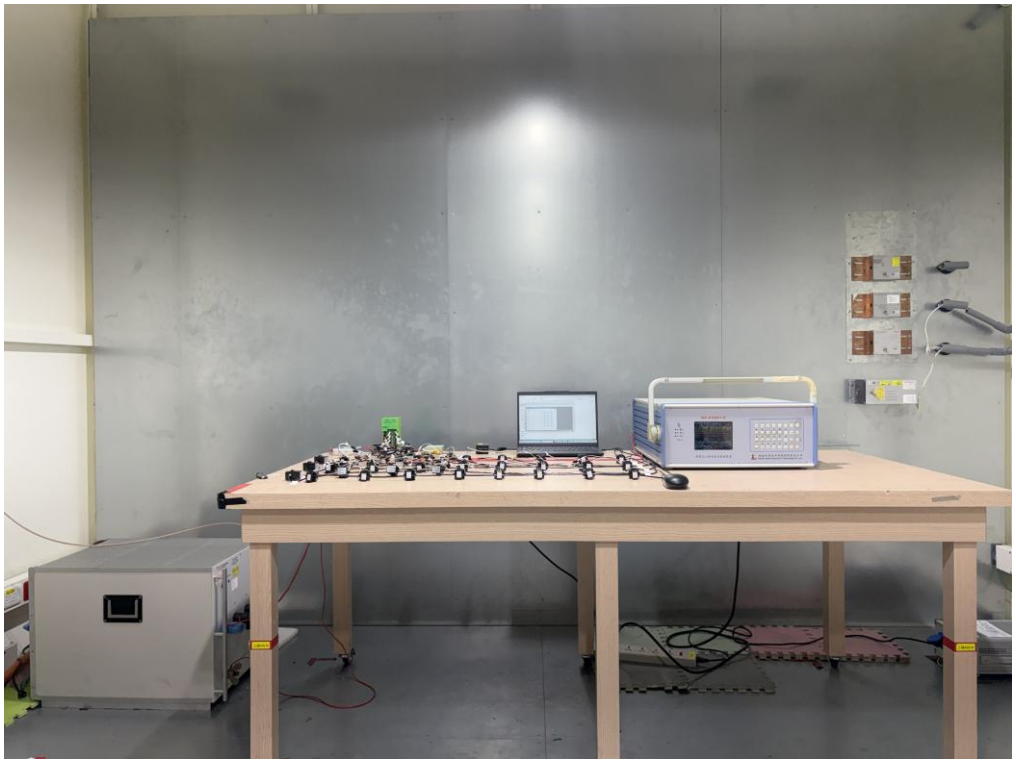
Low voltage AC mains port test photos

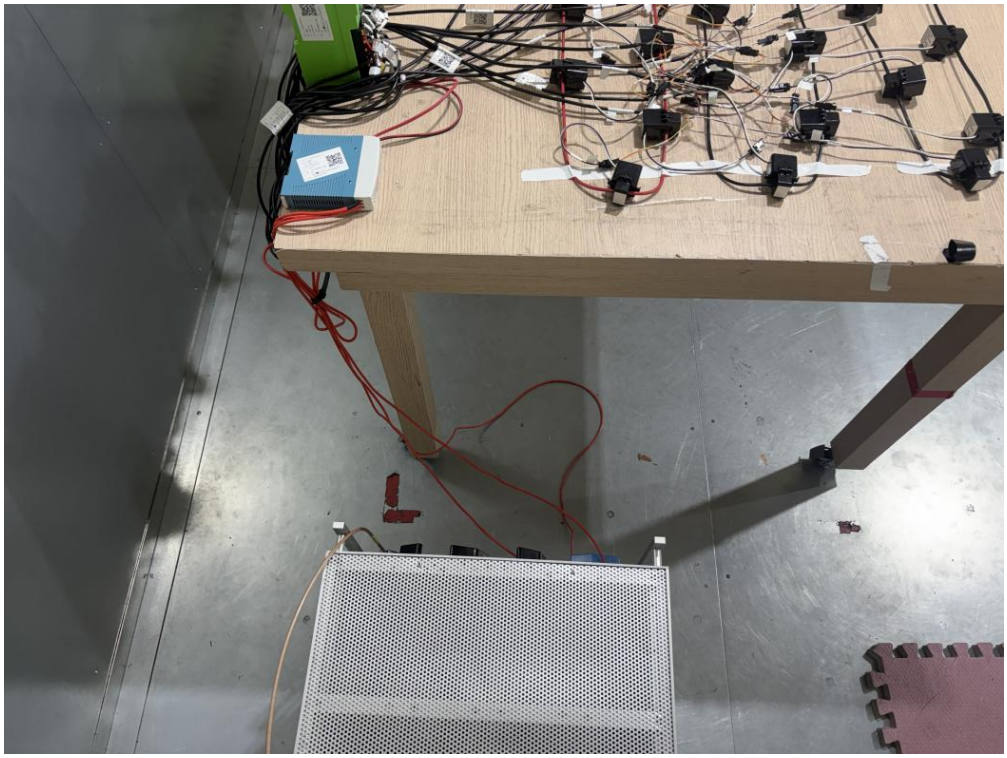




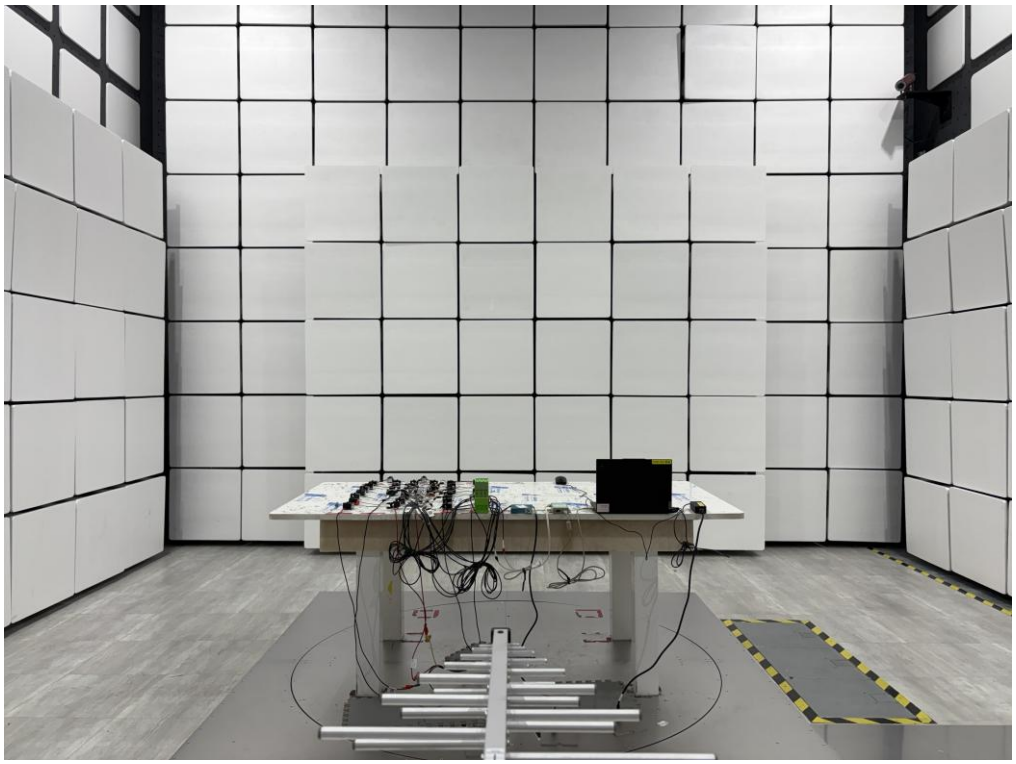
EN 55011

Conducted disturbances test photos

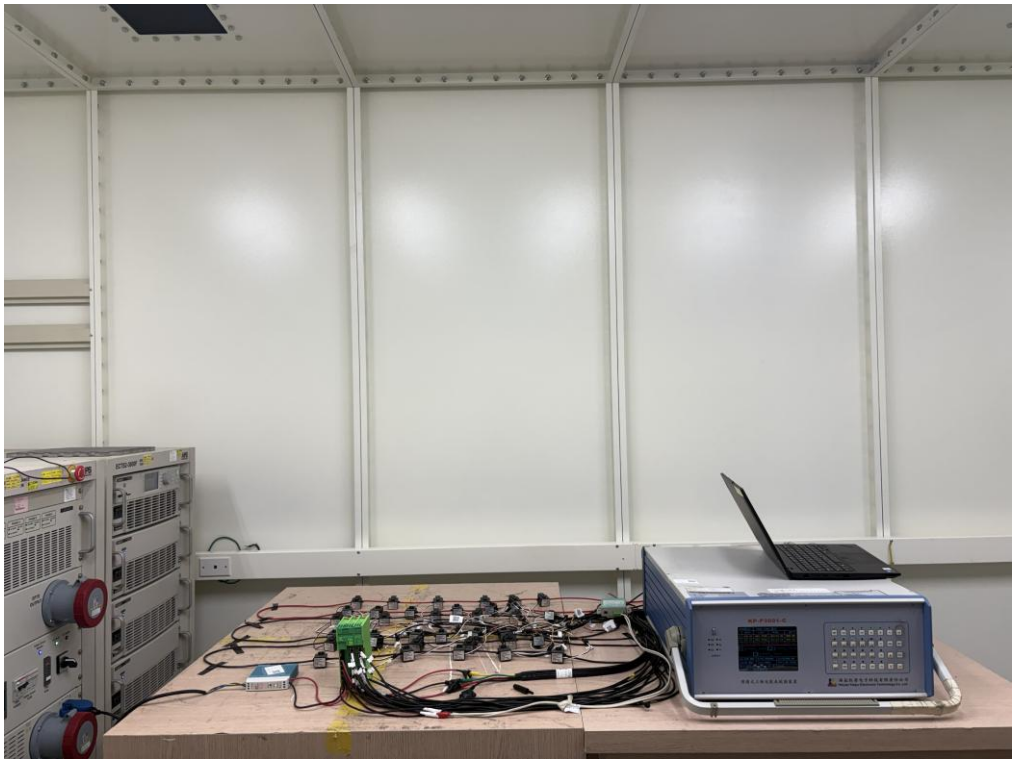




Electromagnetic radiation disturbance test photos

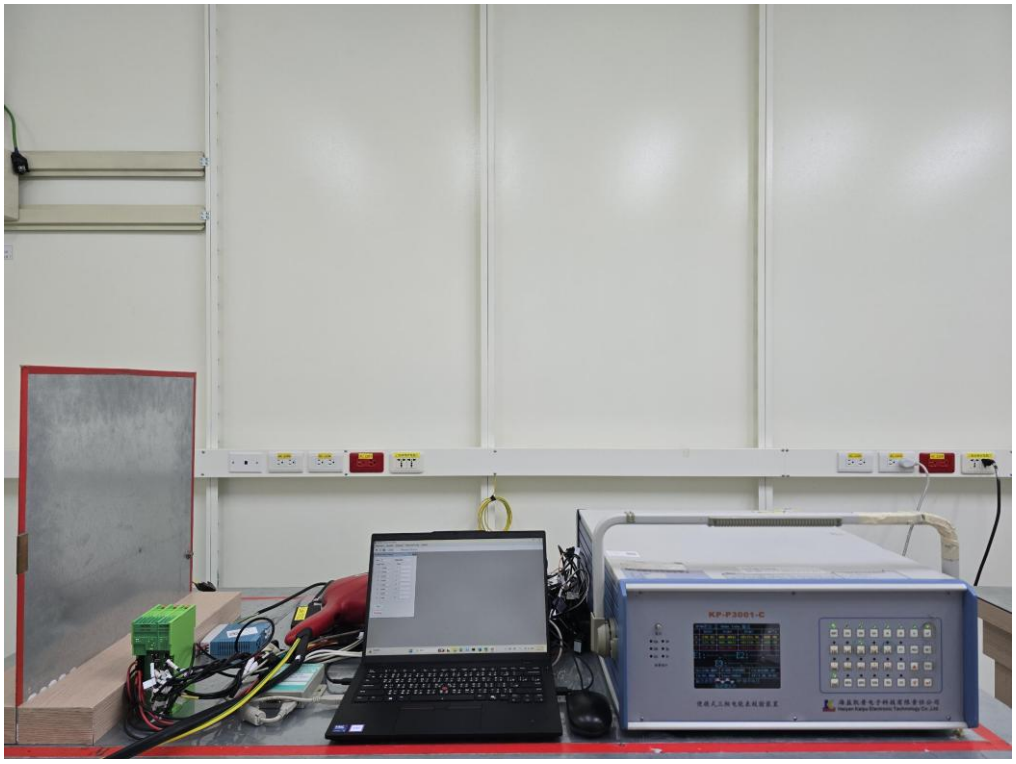


Harmonic current emissions & Voltage changes, voltage fluctuations and flicker test photos

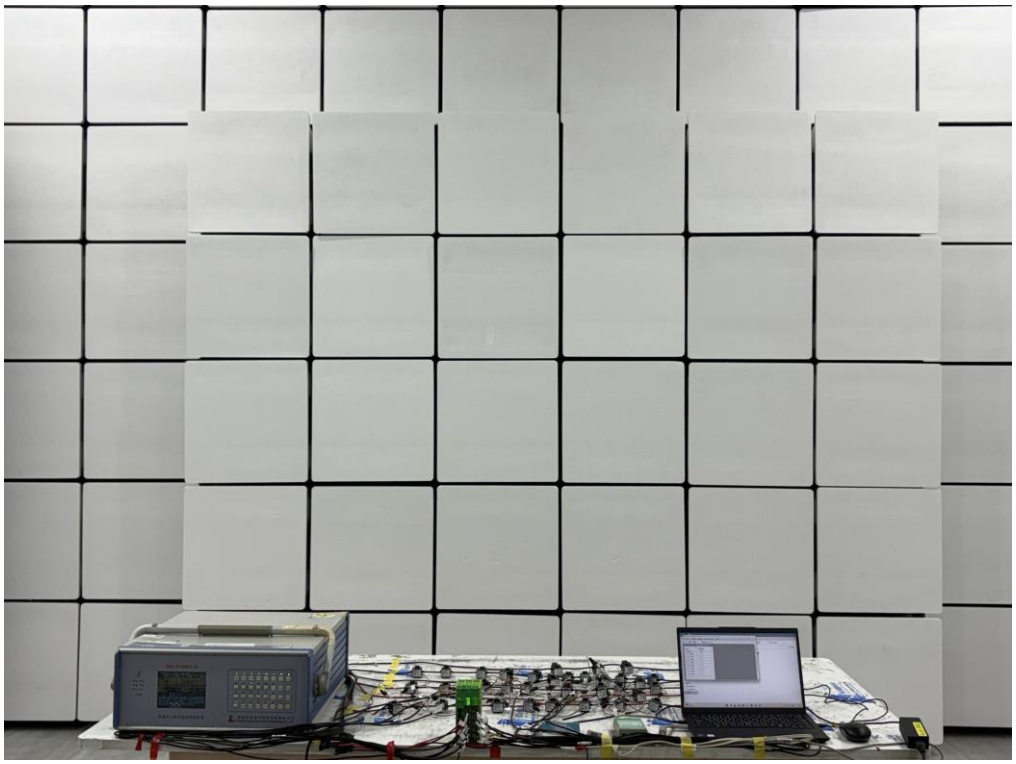


Immunity test photos - EN 55035, EN IEC 61000-6-2

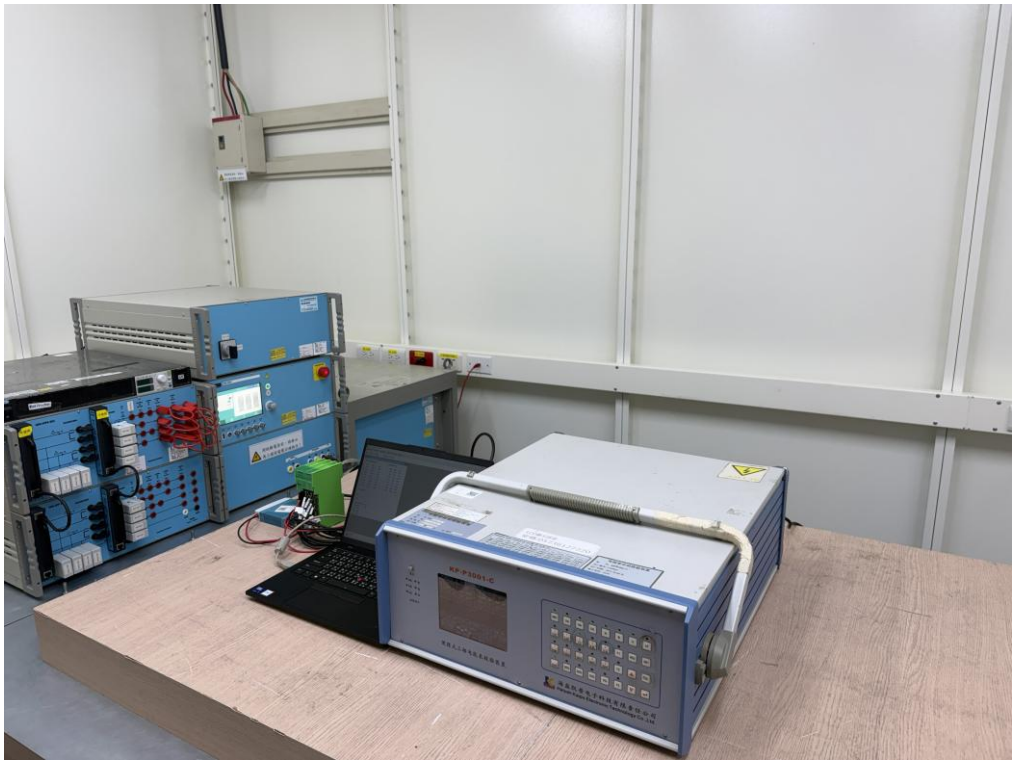
Electrostatic discharge immunity



Radiated, radio-frequency, electromagnetic field immunity

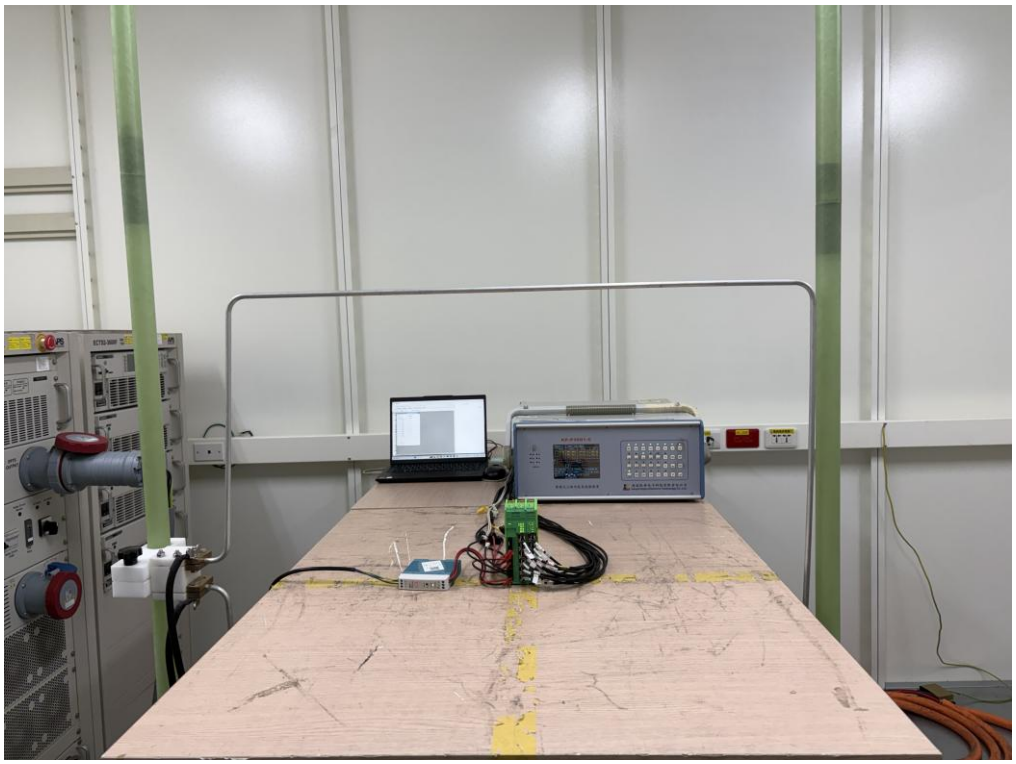


Electrical fast transient/burst immunity / Surge immunity



Immunity to conducted disturbances, induced by radio-frequency fields

Power frequency magnetic field immunity



Voltage dips, short interruptions and voltage variations immunity

9 EUT PHOTOS

Please refer to document Appendix No.: EP-2605T132-1 (APPENDIX-EUT PHOTOS).

End of Test Report