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检测
TESTING
CNAS L3163

CE EMC Test Report

Project No. : 2401C127A
Equipment : AX1500 Wi-Fi 6 5G NR Router
Brand Name : Tenda
Test Model : 5G01
Series Model : N/A
Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD.
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD.
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Receipt : Jan. 16, 2024
Date of Test : Jan. 17, 2024 ~ Feb. 04, 2024
Issued Date : Apr. 09, 2024
Report Version : R00
Test Sample : Engineering Sample No.: DG2024011643
Standard(s) : EN 55032:2015+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021
EN 55035:2017+A11:2020

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

Prepared by :

Scott Xiang

Scott Xiang

Approved by :

Kevin Li

Kevin Li

No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000

Web: www.newbtl.com

Service mail: btl_qa@newbtl.com

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: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

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

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

Limitation

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

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

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-EMC-1-2401C127A	R00	This is a copy report which referencing test data are provided from test report (BTL-EMC-1-2401C127). The product name, brand name, model name, applicant and manufacturer information are changed which does not affect the test results, the rest are kept the same.	Apr. 09, 2024	Valid

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

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

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

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

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

NOTE:

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

1.1 TEST FACILITY

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

For Conducted emissions&H&F items: Room 108,Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan, Guangdong, China.

For other items: No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

1.2 MEASUREMENT UNCERTAINTY

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

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

A. Radiated emissions up to 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)
DG-CB01 (3m)	CISPR	30MHz ~ 200MHz	V	4.92
		30MHz ~ 200MHz	H	3.94
		200MHz ~ 1,000MHz	V	4.60
		200MHz ~ 1,000MHz	H	4.32

B. Radiated emissions above 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)
DG-CB01 (3m)	CISPR	1GHz ~ 6GHz	4.56

C. Conducted emissions AC mains power port measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)
SSL-C01	CISPR	150kHz ~ 30MHz	2.68

D. Asymmetric mode conducted emissions measurement:

Test Site	Method	Test Item	U , (dB)
SSL-C01	CISPR	AAN Cat.5 LCL = 65 ... 50 dB	3.90

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

Test Site	Method	Item	U (%)
SSL-C01	EN IEC 61000-3-2 EN 61000-3-3	Voltage	0.817
		Current	0.817

F. Immunity Measurement:

Test Site	Method	Item	U
DG-SR02	IEC 61000-4-2	Rise time tr	7.00%
		Peak current Ip	6.50%
		Current at 30 ns	6.60%
		Current at 60 ns	6.80%
DG-CB05	IEC 61000-4-3 (80MHz~6GHz)	Electromagnetic field immunity test	2.2dB
DG-SR05	IEC 61000-4-4	Peak voltage (VP)	3.8%
		Rise time (tr)	4.4%
		Pulse width(tw)	4.2%
		Pulse Freq.(kHz)	0.7%
		Burst Duration(ms)	1.5%
		Burst Period(ms)	1.4%
		Peak voltage (VP)-with clamp	3.9%
		Rise time (tr) -with clamp	4.4%
		Pulse width(tw) -with clamp	4.2%
DG-SR05	IEC 61000-4-5	Open-Circuit Output Voltage (1.2/50us)	4.0%
		Open circuit front time (1.2/50us)	6.2%
		Open circuit time of half value (1.2/50us)	4.7%
DG-CB06	IEC 61000-4-6 (150kHz-80MHz)	CDN	1.28dB
DG-SR05	IEC 61000-4-8	Magnetic Field Strength	1.91%
DG-SR01	IEC 61000-4-11	DIP Amplitude	3.6%
		DIP Time Event	4.0%

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

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Tested By
Radiated emissions up to 1 GHz	20°C	50%	Trey Chen
Radiated emissions above 1 GHz	20°C	50%	Trey Chen
Conducted emissions AC mains power port	23°C	50%	Atom Huang
Asymmetric mode conducted emissions	23°C	50%	Atom Huang
Harmonic current	23°C	50%	Atom Huang
Voltage fluctuations (Flicker)	23°C	50%	Atom Huang

Test Item	Temperature	Humidity	Pressure	Tested By
ESD	18°C	40%	1030hPa	Leo Liu
RS	17°C	47%	/	Hunter Xu
EFT	15°C	47%	/	Jensen Jiang
Surge	15°C	47%	/	Jensen Jiang
CS	17°C	59%	/	Lance Chen
PFMF	15°C	47%	/	Jensen Jiang
Dips	19°C	52%	/	Zinco Chen

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	AX1500 Wi-Fi 6 5G NR Router
Brand Name	Tenda
Test Model	5G01
Series Model	N/A
Model Difference(s)	N/A
Identification No. of EUT(S/N)	EF071011352000024
Dimensions and mass	94*118*196mm
Component unit of EUT	<input type="checkbox"/> Single unit <input checked="" type="checkbox"/> Multiple unit
Sample Status	<input checked="" type="checkbox"/> Engineering sample <input type="checkbox"/> Final shipment prototype
Power Source	DC Voltage supplied from AC adapter. 1# Model: BN026-A24012E(EU) 2# Model: BN026-A24012B(UK)
Power Rating	I/P:100-240V ~ 50/60Hz 0.7A O/P:12.0V --- 2.0A
Connecting I/O Port(s)	1* PWR port 1* LAN1 port 1* WAN/LAN2 port
Classification of EUT	Class B
Highest Internal Frequency(Fx)	5850MHz

Note:

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

2.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	FULL SYSTEM(2.4GWIFI+5GWIFI+LTE Traffic B1/B2/B3/B4/B5/B7/B8/B20/B28/B66/B38/B40/B41)
Mode 2	FULL SYSTEM(2.4GWIFI+5.8GWIFI+WCDMA Traffic B1/B2/B5B38)
Mode 3	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78 SA)
Mode 4	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n1/n3/n7/n38/n40/n41/n77/n78 NSA)
Mode 5	FULL SYSTEM(2.4GWIFI+5.8GWIFI+idle)

Radiated emissions up to 1 GHz Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(2.4GWIFI+5GWIFI+LTE Traffic B38)

Radiated emissions Above 1 GHz Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(2.4GWIFI+5GWIFI+LTE Traffic B38)

Conducted emissions AC mains power port Test	
Final Test Mode	Description
Mode 4	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n40 NSA)

Asymmetric mode conducted emissions Test	
Final Test Mode	Description
Mode 4	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n40 NSA) (LAN1 1Gbps / WAN/LAN2 1Gbps)

Harmonic current & Voltage fluctuations (Flicker) Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(2.4GWIFI+5GWIFI+LTE Traffic B38)

Immunity Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM(2.4GWIFI+5GWIFI+LTE Traffic B1/B2/B3/B4/B5/B7/B8/B20/B28/B66/B38/B40/B41)
Mode 2	FULL SYSTEM(2.4GWIFI+5.8GWIFI+WCDMA Traffic B1/B2/B5B38)
Mode 3	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78 SA)
Mode 4	FULL SYSTEM(2.4GWIFI+5.8GWIFI+5G NR_n1/n3/n7/n38/n40/n41/n77/n78 NSA)
Mode 5	FULL SYSTEM(2.4GWIFI+5.8GWIFI+idle)

Note:

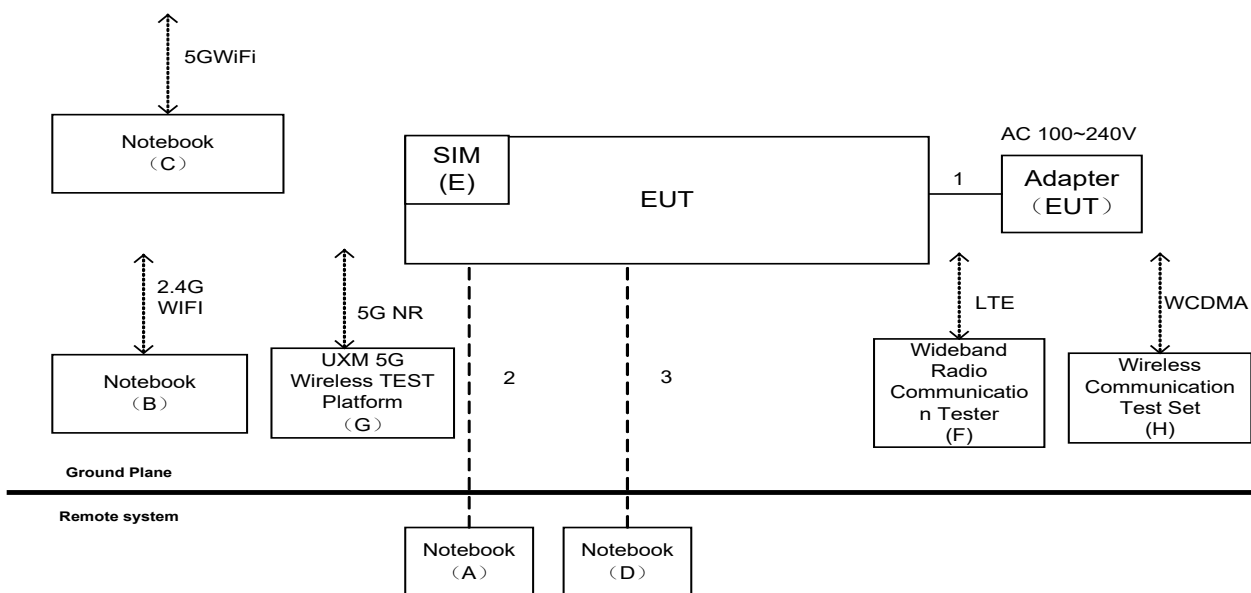
1. Two adapters only differ in the plug, so tested the EU plug.
2. For EMI: Evaluated the mode 1-5. The worst is mode 1 and recorded in this report.
3. Mode 1 tested the LTE B1/B2/B3/B4/B5/B7/B8/B20/B28/B66/B38/B40/B41, the worst case is LTE B38 and recorded in this report.
Mode 4 tested the 5G NR_n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78 SA, the worst case is 5G NR_n40 and recorded in this report.
4. The product supports 2.4G&5G WIFI&WCDMA<E&5G NR function.
The frequency exemptions are 2400-2483.5MHz, 5150-5250MHz, 5725-5850MHz.
5. Radiated emission above 1GHz tested with 2.4G&5G filter.

2.3 EUT OPERATING CONDITIONS

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

1. SIM Card is plugged to the EUT.
2. EUT connected to Notebook(A&D) via RJ45 Cable.
3. EUT connected to Adapter via DC Cable.
4. EUT connected to Notebook(C) via 5G WiFi function.
5. EUT connected to Notebook(B) via 2.4G WiFi function.
6. EUT connected to UXM 5G Wireless TEST Platform via 5G NR function.
7. EUT connected to Wideband Radio Communication Tester via LTE function.
8. EUT connected to Wireless Communication Test Set via WCDMA function.

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Notebook	Lenovo	V310-14ISK	LR07GZHC
B	Notebook	Lenovo	V310-14ISK	LR07GZNB
C	Notebook	Lenovo	V310-14ISK	LR07GZML
D	Notebook	Lenovo	V310-14IKB	LR07SH58
E	SIM	N/A	N/A	N/A
F	Wideband Radio Communication Tester	RS	CMW500	122125
G	UXM 5G Wireless TEST Platform	KEYSIGHT	E7515B	MY59110295
H	Wireless Communication Test Set	Agilent	(8960 series)E5515C	MY48364189

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m
2	RJ45 Cable	NO	NO	10m
3	RJ45 Cable	NO	NO	10m

3. EMC EMISSION TEST

3.1 RADIATED EMISSIONS UP TO 1 GHZ

3.1.1 LIMITS

Class B equipment up to 1 GHz

Frequency Range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance m	Detector type/ bandwidth	
30 - 230	SAC	3	Quasi peak / 120 kHz	40
230 - 1000				47

Notes:

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

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3142C	47662	Dec. 01, 2024
2	Amplifier	EMC INSTRUMENT	EMC001330	980987	Nov. 17, 2024
3	MXE EMI Receiver	Keysight	N9038A	MY56400091	Dec. 22, 2024
4	Cable	RW	LMR-400(30MHz-1GHz)(12m+9.5m+0.8M)	N/A	Nov. 27, 2024
5	Controller	ETS-Lindgren	2090	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

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

All calibration period of equipment list is one year.

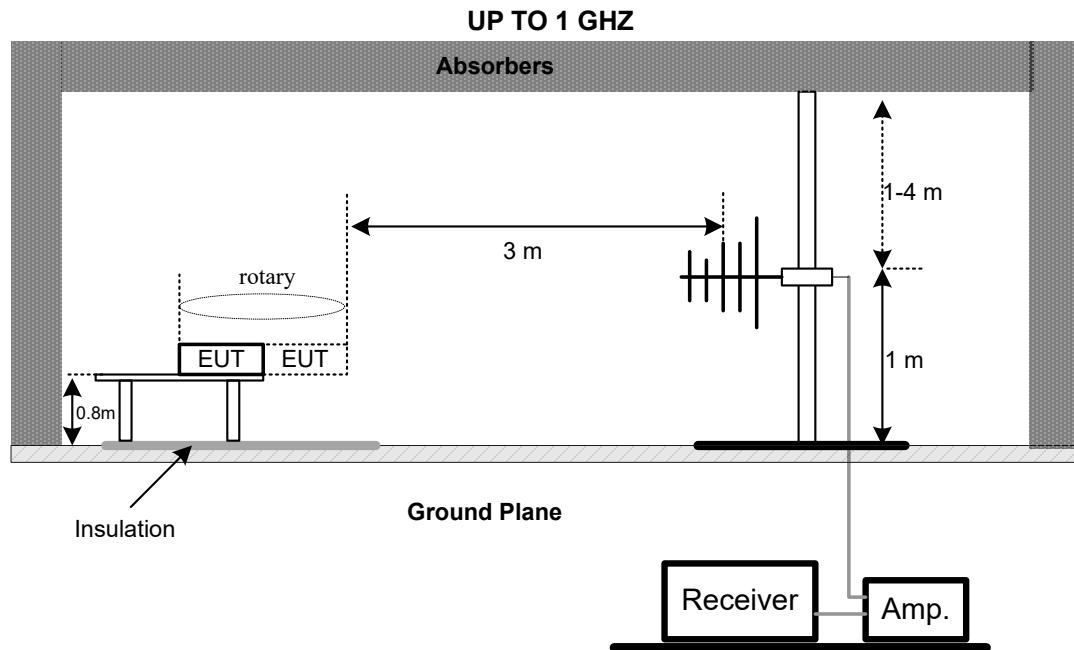
3.1.3 TEST PROCEDURE

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

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 MEASUREMENT DISTANCE

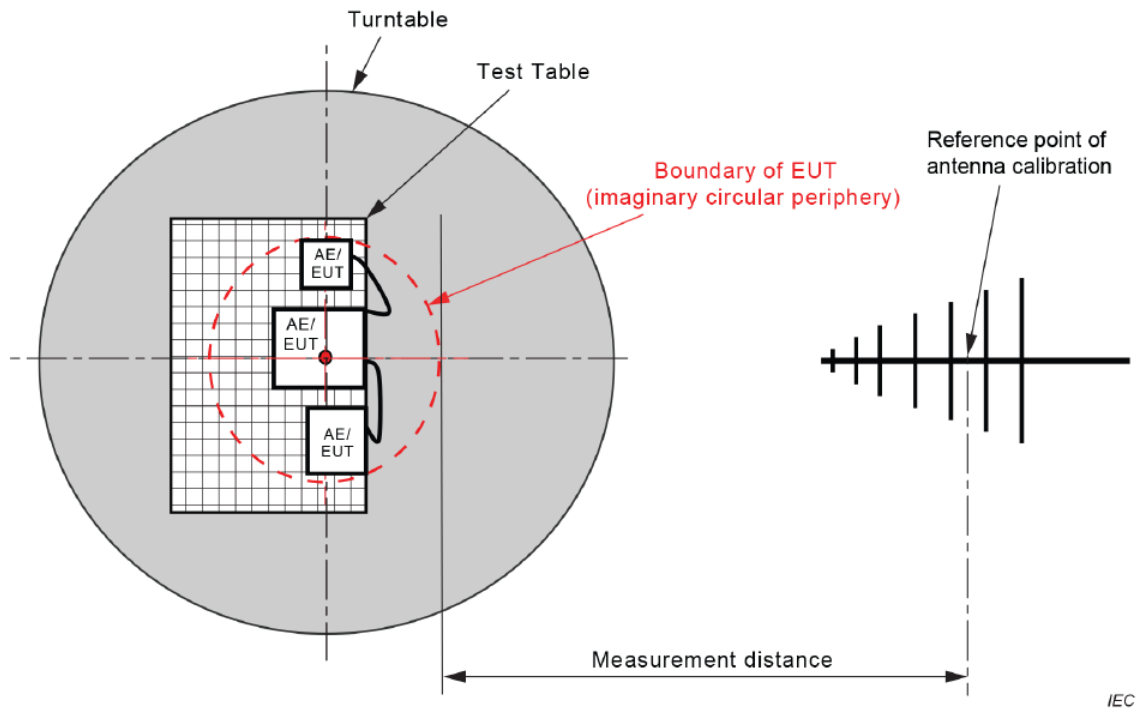


Figure C.1 – Measurement distance

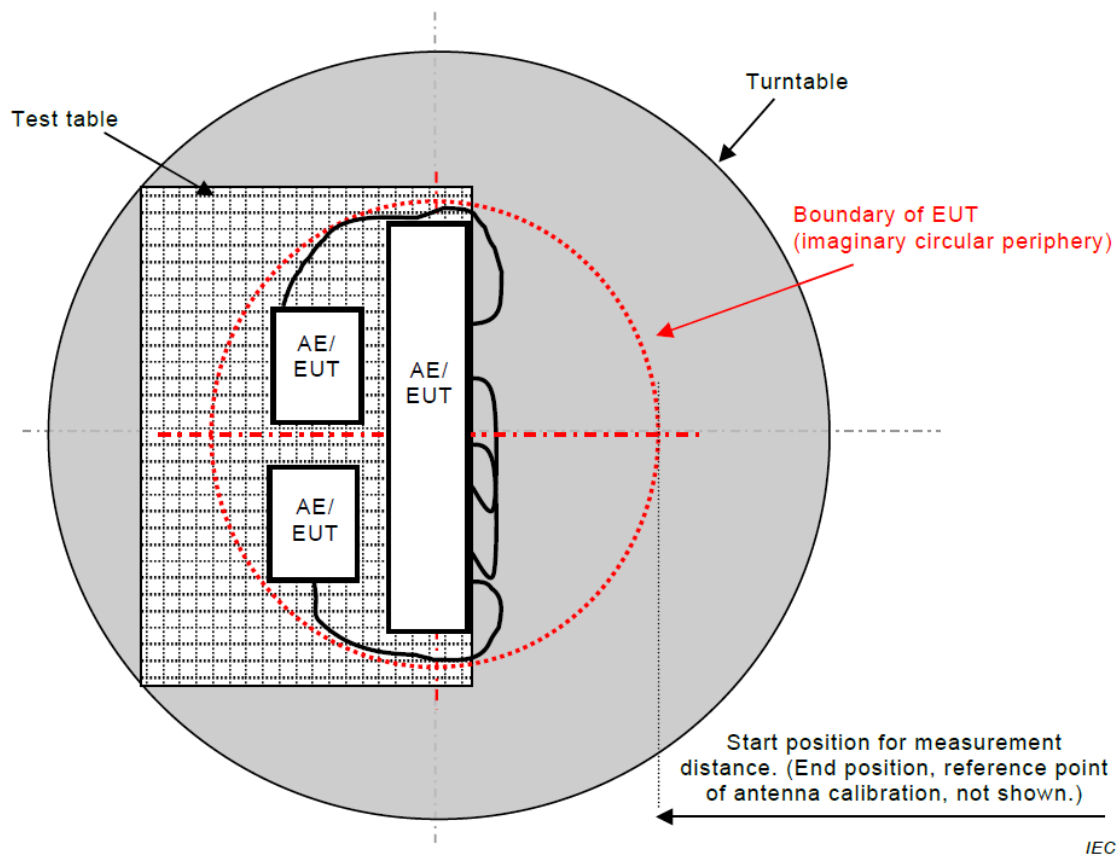
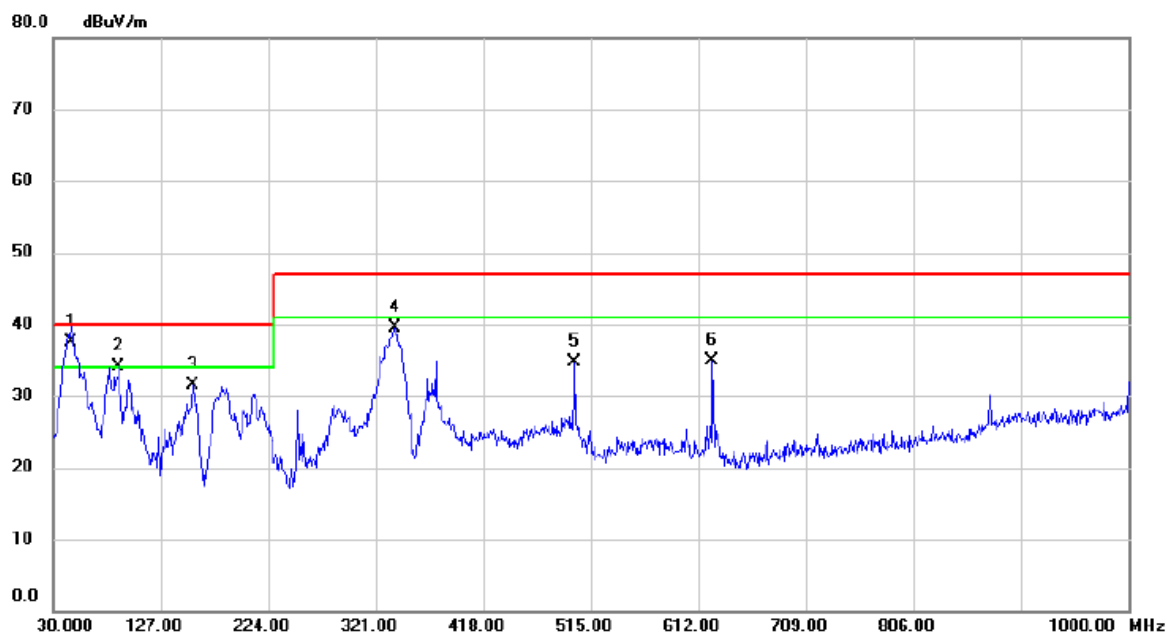


Figure C.2 – Boundary of EUT, Local AE and associated cabling

3.1.7 TEST RESULTS

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



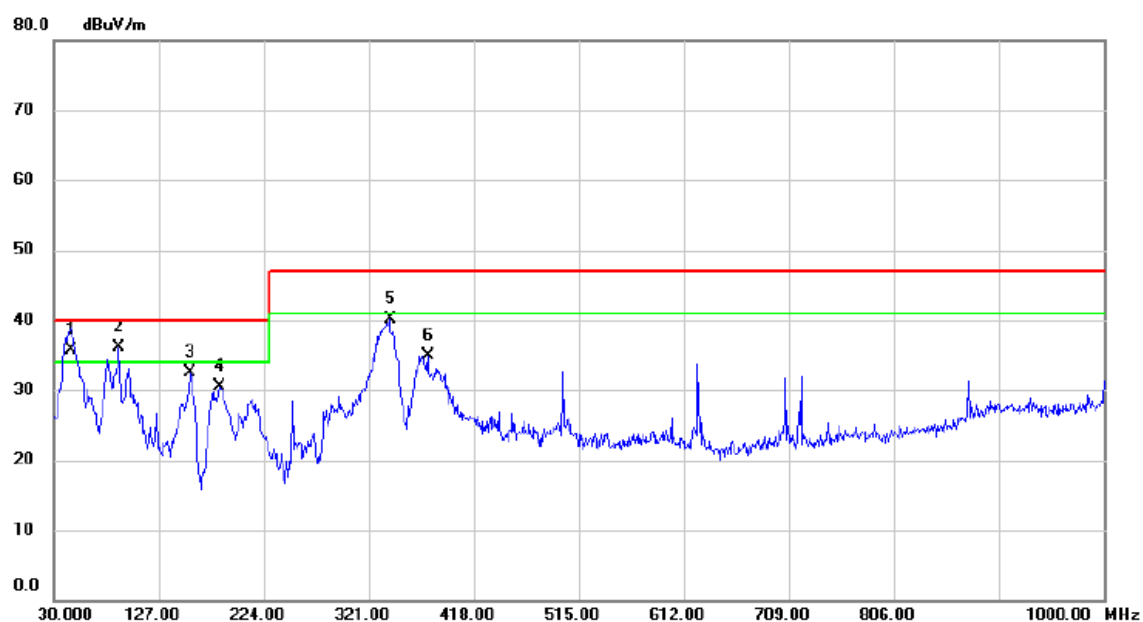
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	45.5200	58.21	-20.69	37.52	40.00	-2.48	QP	
2	!	89.1700	56.98	-22.97	34.01	40.00	-5.99	QP	
3		156.1000	52.06	-20.61	31.45	40.00	-8.55	QP	
4		338.4600	54.39	-14.88	39.51	47.00	-7.49	QP	
5		500.4500	45.55	-10.89	34.66	47.00	-12.34	QP	
6		624.6100	43.24	-8.34	34.90	47.00	-12.10	QP	

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



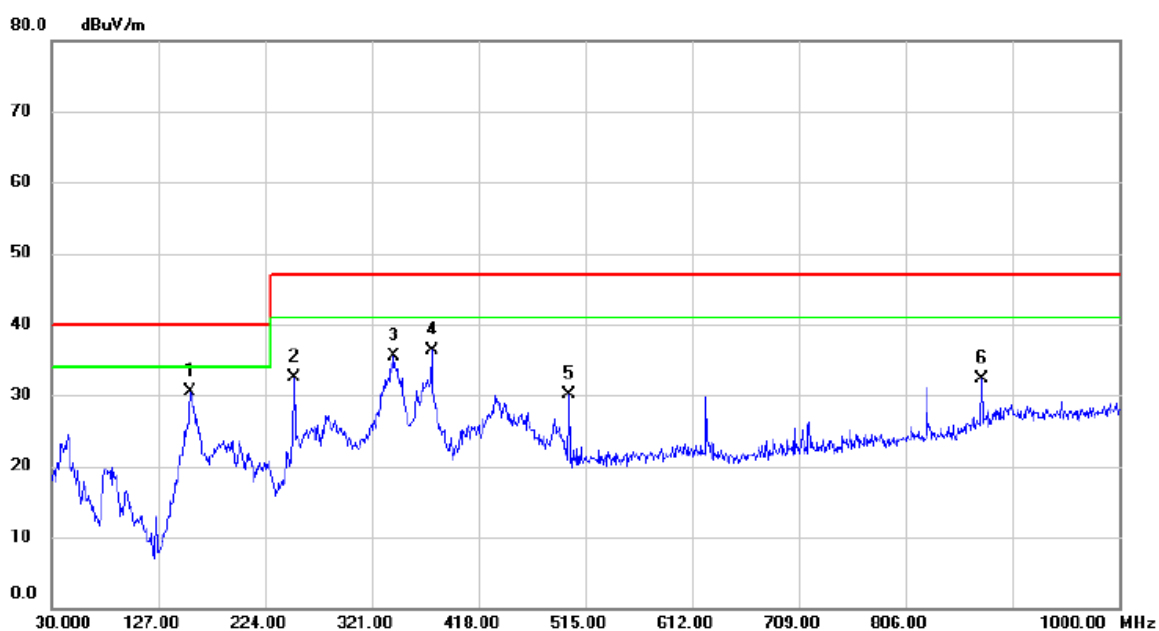
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		45.5200	45.63	-20.69	24.94	40.00	-15.06	QP	
2		156.1000	48.13	-20.61	27.52	40.00	-12.48	QP	
3		250.1900	49.95	-16.78	33.17	47.00	-13.83	QP	
4	*	338.4600	53.61	-14.88	38.73	47.00	-8.27	QP	
5		375.3200	51.83	-13.26	38.57	47.00	-8.43	QP	
6		874.8700	36.19	-4.10	32.09	47.00	-14.91	QP	

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



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	!	45.5200	56.41	-20.69	35.72	40.00	-4.28	QP	
2	*	90.1400	59.00	-22.90	36.10	40.00	-3.90	QP	
3		156.1000	53.14	-20.61	32.53	40.00	-7.47	QP	
4		183.2600	50.05	-19.53	30.52	40.00	-9.48	QP	
5		340.4000	54.90	-14.81	40.09	47.00	-6.91	QP	
6		375.3200	48.24	-13.26	34.98	47.00	-12.02	QP	

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



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	156.1000	51.15	-20.61	30.54	40.00	-9.46	QP	
2		250.1900	49.31	-16.78	32.53	47.00	-14.47	QP	
3		341.3700	50.33	-14.75	35.58	47.00	-11.42	QP	
4		375.3200	49.55	-13.26	36.29	47.00	-10.71	QP	
5		500.4500	41.02	-10.89	30.13	47.00	-16.87	QP	
6		874.8700	36.41	-4.10	32.31	47.00	-14.69	QP	

3.2 RADIATED EMISSIONS ABOVE 1 GHZ

3.2.1 LIMITS

Class B equipment above 1 GHz

Frequency Range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance m	Detector type/bandwidth	
1000 - 3000	FSOATS	3	Average / 1 MHz	50
3000 - 6000				54
1000 - 3000			Peak / 1 MHz	70
3000 - 6000				74

Notes:

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

Required highest frequency for radiated measurement

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

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cable	RW	LMR-400(1GHz-18GHz)(9.5m+2.5m+1M)	N/A	Nov. 27, 2024
2	Controller	ETS-Lindgren	2090	N/A	N/A
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
4	Double-Ridged Waveguide Horn Antennas	ETS-LINDGREN	3117-PA	224991	Apr. 14, 2024
5	MXA Signal Analyzer	Keysight	N9020B	MY57100162	Dec. 22, 2024
6	Preamplifier	ETS-LINDGREN	3117-PA	224991	Jun. 17, 2024

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

All calibration period of equipment list is one year.

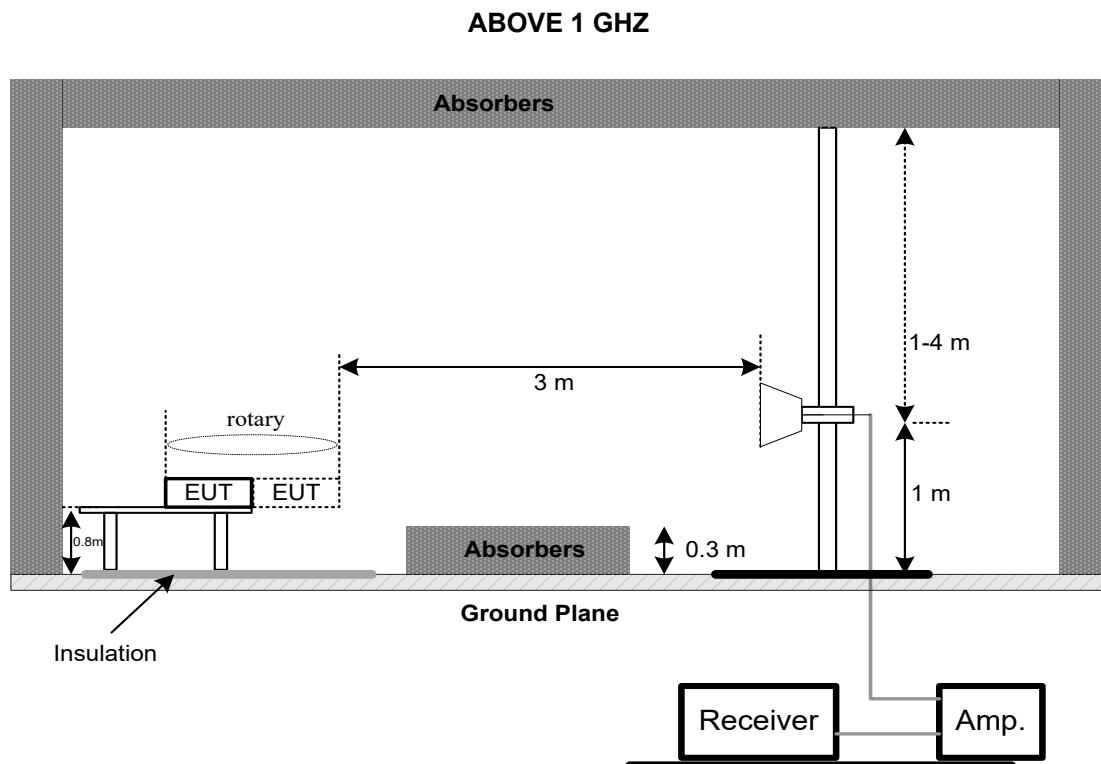
3.2.3 TEST PROCEDURE

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

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP



3.2.6 MEASUREMENT DISTANCE

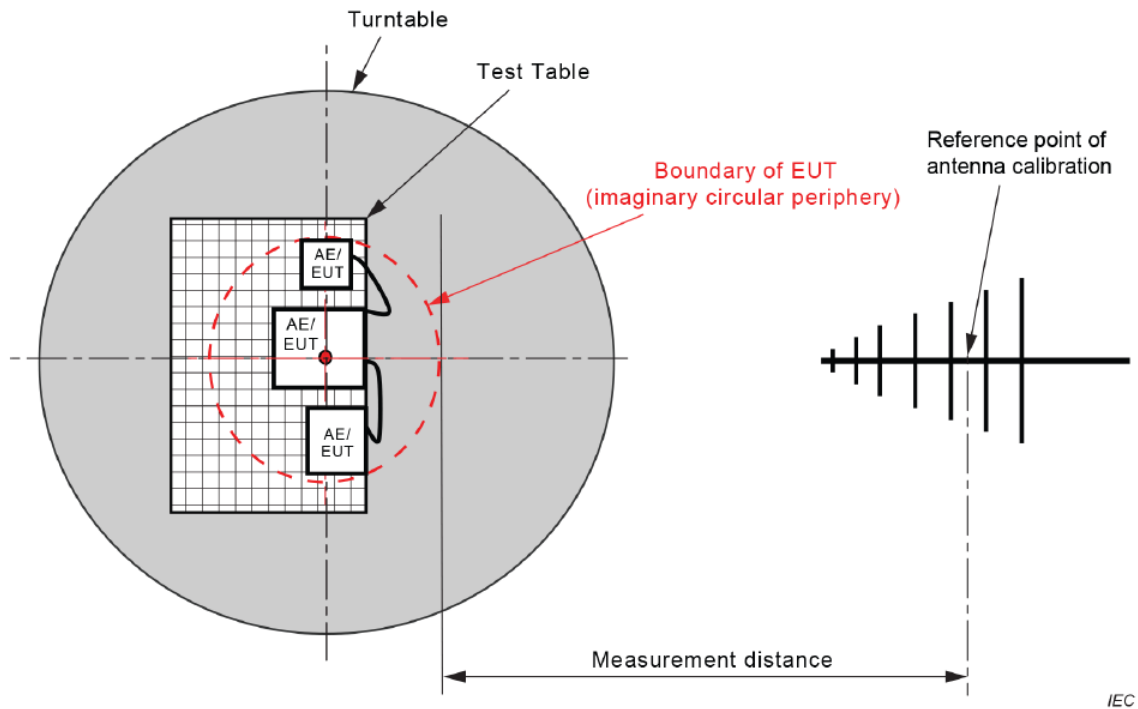


Figure C.1 – Measurement distance

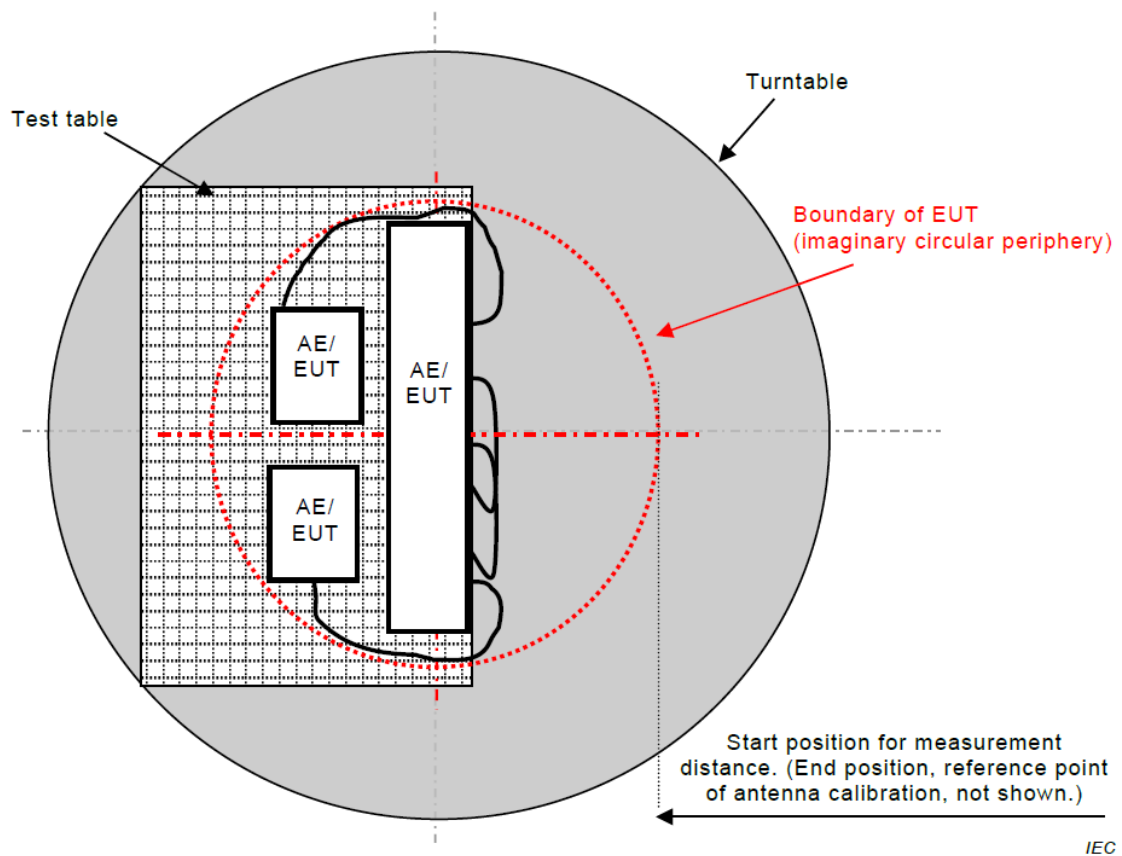
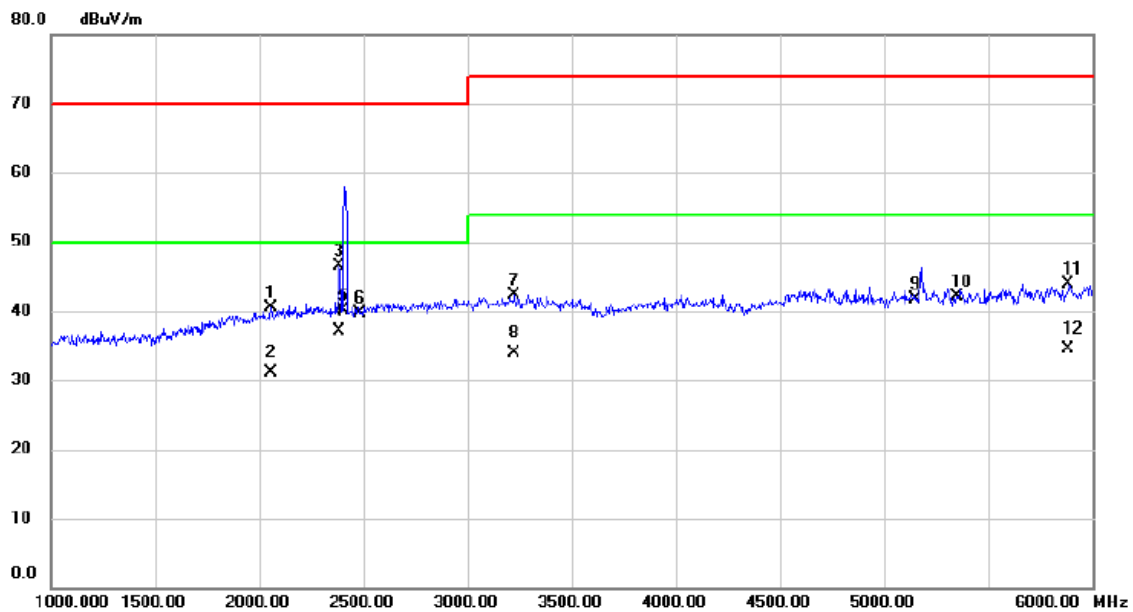


Figure C.2 – Boundary of EUT, Local AE and associated cabling

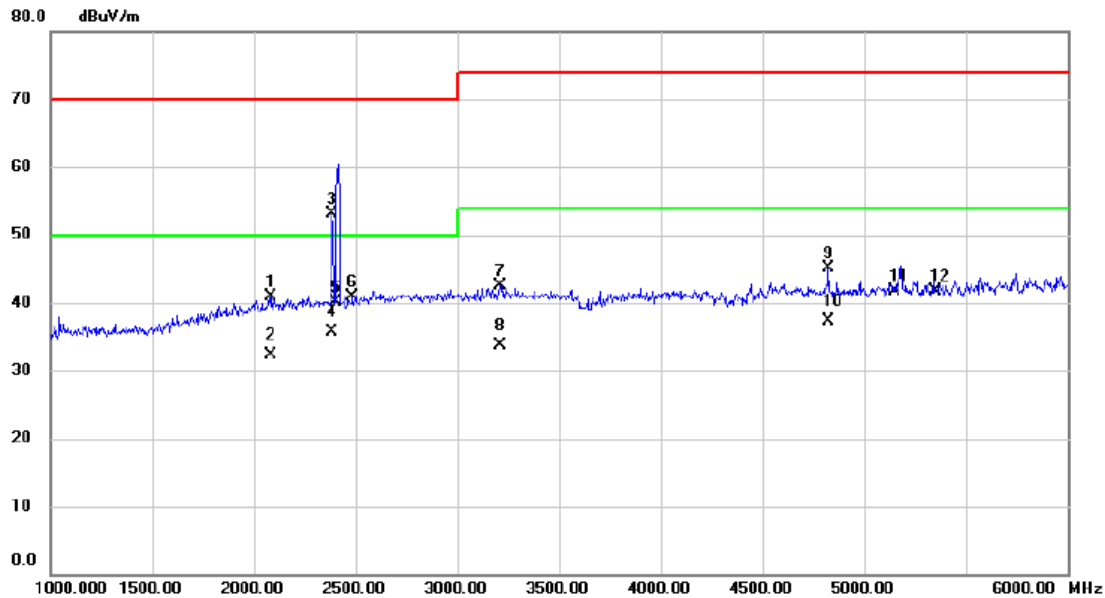
3.2.7 TEST RESULTS

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Mode 1		
Note	2.4G WIFI (2400-2483.5MHz) and 5G WIFI (5150-5350MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



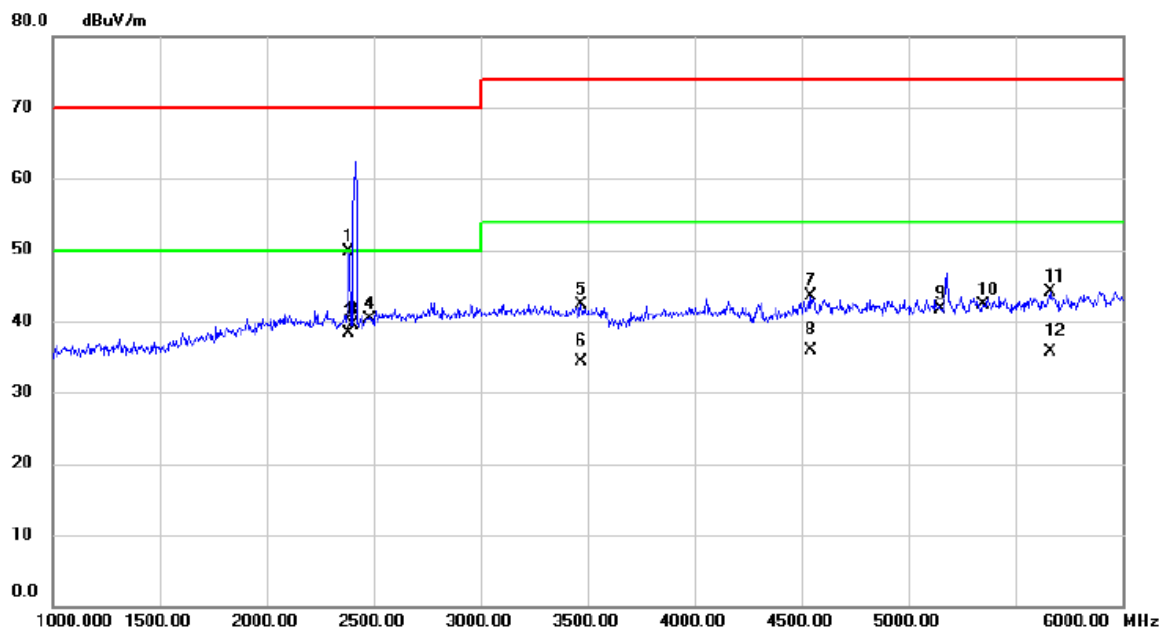
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2055.000	51.81	-11.27	40.54	70.00	-29.46	peak	
2		2055.000	42.36	-11.27	31.09	50.00	-18.91	AVG	
3		2385.000	56.61	-10.08	46.53	70.00	-23.47	peak	
4	*	2385.000	47.25	-10.08	37.17	50.00	-12.83	AVG	
5		2400.000	50.11	-10.03	40.08	70.00	-29.92	peak	
6		2483.500	49.49	-9.73	39.76	70.00	-30.24	peak	
7		3225.000	50.32	-7.96	42.36	74.00	-31.64	peak	
8		3225.000	41.95	-7.96	33.99	54.00	-20.01	AVG	
9		5150.000	46.66	-4.86	41.80	74.00	-32.20	peak	
10		5350.000	47.01	-4.92	42.09	74.00	-31.91	peak	
11		5885.000	47.91	-4.00	43.91	74.00	-30.09	peak	
12		5885.000	38.54	-4.00	34.54	54.00	-19.46	AVG	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Mode 1		
Note	2.4G WIFI (2400-2483.5MHz) and 5G WIFI (5150-5350MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



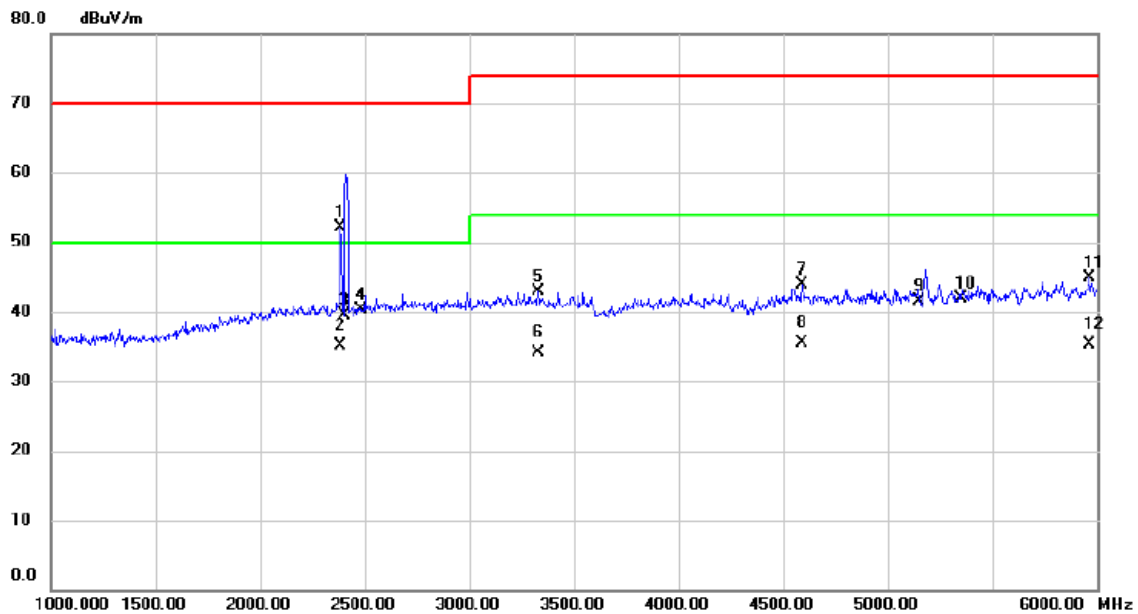
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2085.000	52.12	-11.16	40.96	70.00	-29.04	peak	
2		2085.000	43.51	-11.16	32.35	50.00	-17.65	AVG	
3		2385.000	63.25	-10.08	53.17	70.00	-16.83	peak	
4	*	2385.000	45.69	-10.08	35.61	50.00	-14.39	AVG	
5		2400.000	50.23	-10.03	40.20	70.00	-29.80	peak	
6		2483.500	50.67	-9.73	40.94	70.00	-29.06	peak	
7		3210.000	50.55	-7.98	42.57	74.00	-31.43	peak	
8		3210.000	41.74	-7.98	33.76	54.00	-20.24	AVG	
9		4825.000	50.23	-5.06	45.17	74.00	-28.83	peak	
10		4825.000	42.36	-5.06	37.30	54.00	-16.70	AVG	
11		5150.000	46.56	-4.86	41.70	74.00	-32.30	peak	
12		5350.000	46.72	-4.92	41.80	74.00	-32.20	peak	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	Mode 1		
Note	2.4G WIFI (2400-2483.5MHz) and 5G WIFI (5150-5350MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2385.000	59.75	-10.08	49.67	70.00	-20.33	peak	
2	*	2385.000	48.31	-10.08	38.23	50.00	-11.77	AVG	
3		2400.000	49.55	-10.03	39.52	70.00	-30.48	peak	
4		2483.500	50.00	-9.73	40.27	70.00	-29.73	peak	
5		3470.000	50.02	-7.63	42.39	74.00	-31.61	peak	
6		3470.000	41.87	-7.63	34.24	54.00	-19.76	AVG	
7		4540.000	48.93	-5.45	43.48	74.00	-30.52	peak	
8		4540.000	41.36	-5.45	35.91	54.00	-18.09	AVG	
9		5150.000	46.55	-4.86	41.69	74.00	-32.31	peak	
10		5350.000	47.32	-4.92	42.40	74.00	-31.60	peak	
11		5665.000	48.71	-4.54	44.17	74.00	-29.83	peak	
12		5665.000	40.25	-4.54	35.71	54.00	-18.29	AVG	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	Mode 1		
Note	2.4G WIFI (2400-2483.5MHz) and 5G WIFI (5150-5350MHz) are intentional transmissions, which are not applicable to the radiation emission requirements in this standard.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2385.000	62.26	-10.08	52.18	70.00	-17.82	peak	
2	*	2385.000	45.26	-10.08	35.18	50.00	-14.82	AVG	
3		2400.000	49.61	-10.03	39.58	70.00	-30.42	peak	
4		2483.500	50.02	-9.73	40.29	70.00	-29.71	peak	
5		3330.000	50.81	-7.82	42.99	74.00	-31.01	peak	
6		3330.000	41.85	-7.82	34.03	54.00	-19.97	AVG	
7		4590.000	49.21	-5.38	43.83	74.00	-30.17	peak	
8		4590.000	40.95	-5.38	35.57	54.00	-18.43	AVG	
9		5150.000	46.46	-4.86	41.60	74.00	-32.40	peak	
10		5350.000	46.92	-4.92	42.00	74.00	-32.00	peak	
11		5965.000	48.79	-3.81	44.98	74.00	-29.02	peak	
12		5965.000	39.17	-3.81	35.36	54.00	-18.64	AVG	

3.3 CONDUCTED EMISSION MEASUREMENT AT AC MAINS POWER PORTS

3.3.1 LIMITS

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

Frequency Range MHz	Coupling Device	Detector Type / bandwidth	Class B Limits (dB(μV))
0.15 - 0.5	AMN	Quasi Peak / 9 kHz	66-56
0.5 - 5			56
5 - 30			60
0.15 - 0.5	AMN	Average / 9 kHz	56-46
0.5 - 5			46
5 - 30			50

NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

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

Margin Level = Measurement Value – Limit Value

3.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	102771	Sep. 24, 2024
2	EMI Test Receiver	R&S	ESCI	100895	Feb. 09, 2024
3	Cable	N/A	RG400	N/A	Mar. 06, 2024
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

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

All calibration period of equipment list is one year.

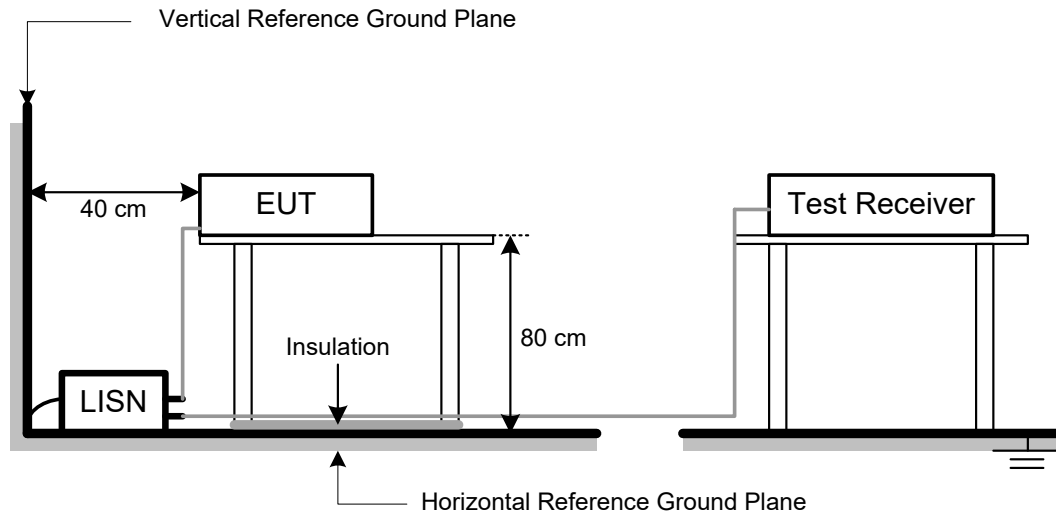
3.3.3 TEST PROCEDURE

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

3.3.4 DEVIATION FROM TEST STANDARD

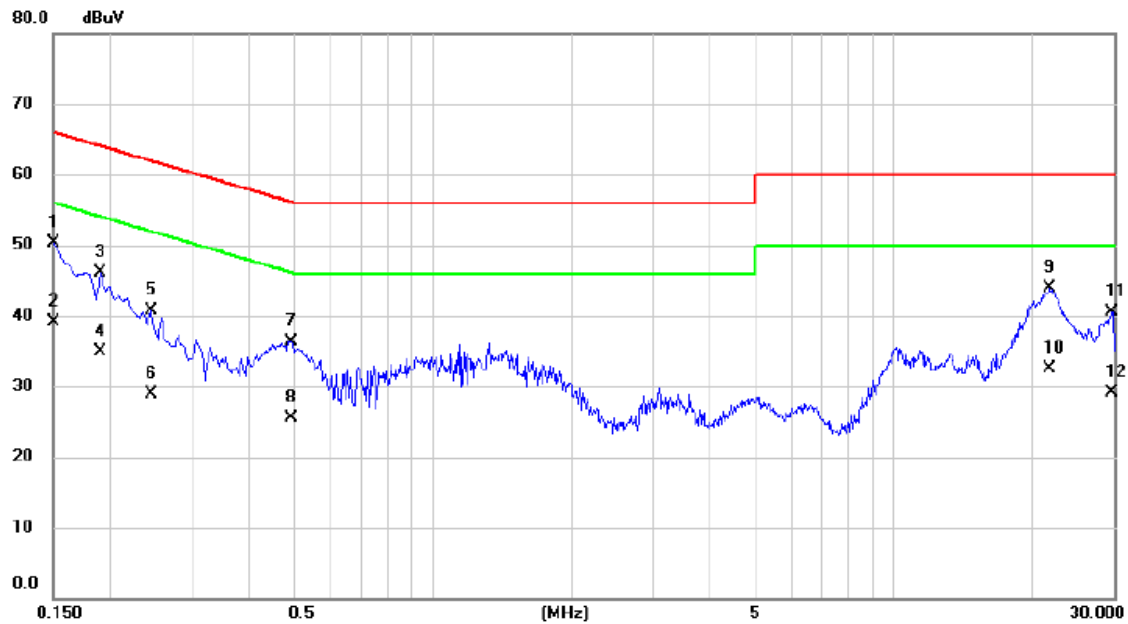
No deviation

3.3.5 TEST SETUP



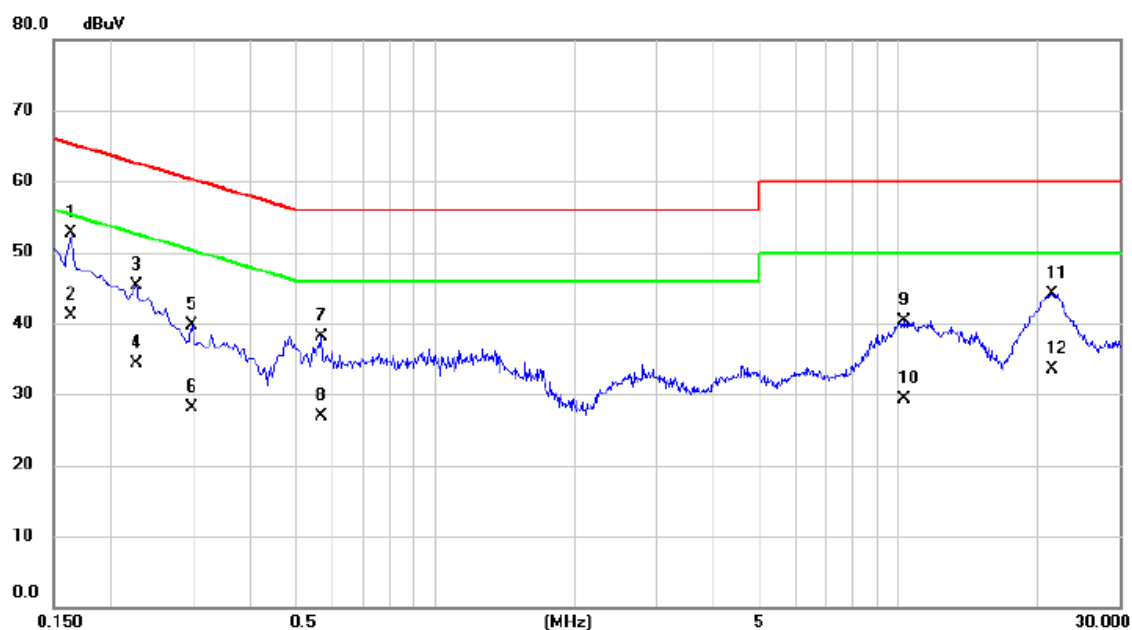
3.3.6 TEST RESULTS

Test Voltage	AC 230V/50Hz	Phase	Line
Test Mode	Mode 4		



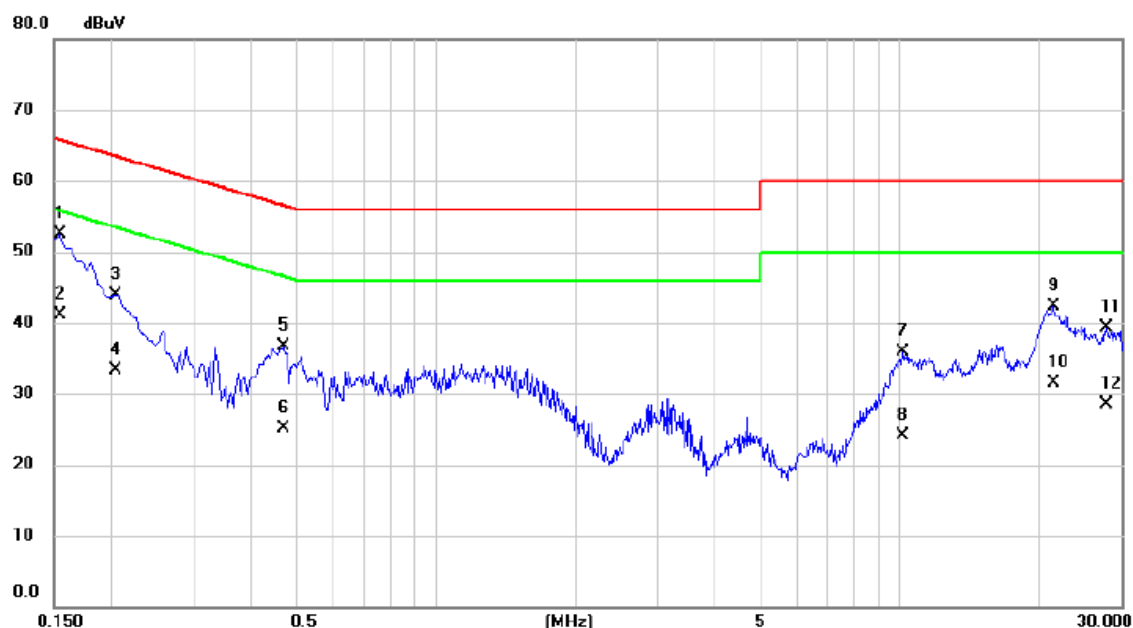
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1500	40.62	9.77	50.39	66.00	-15.61	QP	
2		0.1500	29.30	9.77	39.07	56.00	-16.93	AVG	
3		0.1905	36.28	9.81	46.09	64.01	-17.92	QP	
4		0.1905	25.10	9.81	34.91	54.01	-19.10	AVG	
5		0.2445	30.92	9.79	40.71	61.94	-21.23	QP	
6		0.2445	19.20	9.79	28.99	51.94	-22.95	AVG	
7		0.4920	26.52	9.84	36.36	56.13	-19.77	QP	
8		0.4920	15.60	9.84	25.44	46.13	-20.69	AVG	
9		21.7545	29.88	14.05	43.93	60.00	-16.07	QP	
10		21.7545	18.40	14.05	32.45	50.00	-17.55	AVG	
11		29.7870	24.95	15.60	40.55	60.00	-19.45	QP	
12		29.7870	13.50	15.60	29.10	50.00	-20.90	AVG	

Test Voltage	AC 230V/50Hz	Phase	Neutral
Test Mode	Mode 4		



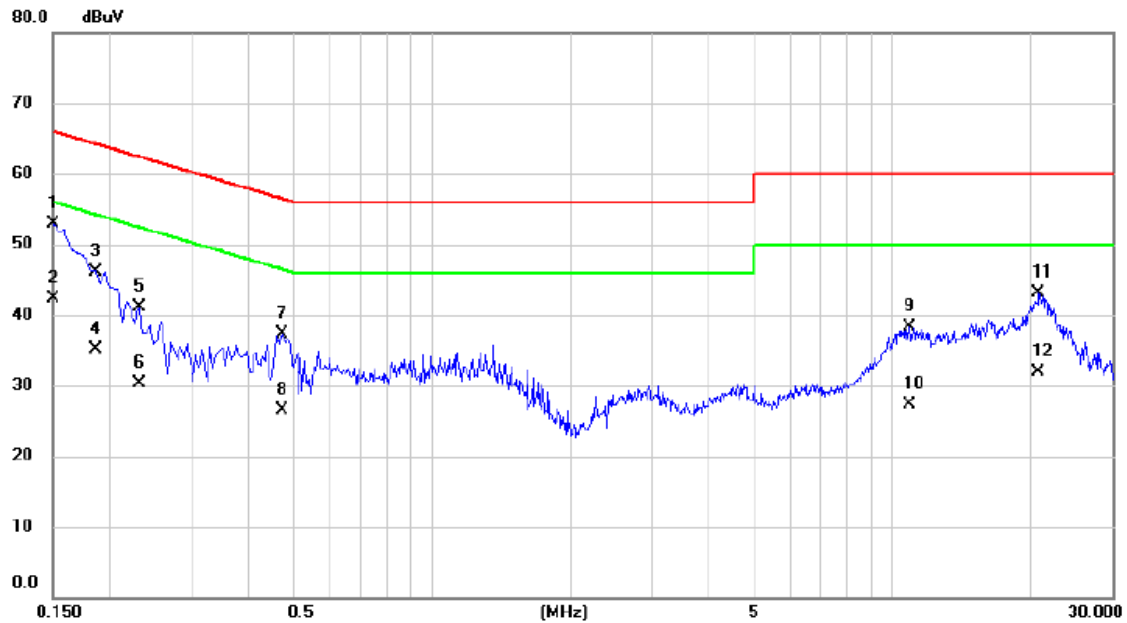
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1635	42.98	9.77	52.75	65.28	-12.53	QP	
2		0.1635	31.40	9.77	41.17	55.28	-14.11	AVG	
3		0.2265	35.56	9.80	45.36	62.58	-17.22	QP	
4		0.2265	24.50	9.80	34.30	52.58	-18.28	AVG	
5		0.2985	29.88	9.82	39.70	60.28	-20.58	QP	
6		0.2985	18.30	9.82	28.12	50.28	-22.16	AVG	
7		0.5685	28.23	9.87	38.10	56.00	-17.90	QP	
8		0.5685	17.10	9.87	26.97	46.00	-19.03	AVG	
9		10.3065	28.18	12.05	40.23	60.00	-19.77	QP	
10		10.3065	17.20	12.05	29.25	50.00	-20.75	AVG	
11		21.5160	30.23	13.93	44.16	60.00	-15.84	QP	
12		21.5160	19.60	13.93	33.53	50.00	-16.47	AVG	

Test Voltage	AC 110V/60Hz	Phase	Line
Test Mode	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1545	42.64	9.77	52.41	65.75	-13.34	QP	
2		0.1545	31.40	9.77	41.17	55.75	-14.58	AVG	
3		0.2040	34.10	9.83	43.93	63.45	-19.52	QP	
4		0.2040	23.50	9.83	33.33	53.45	-20.12	AVG	
5		0.4695	26.77	9.84	36.61	56.52	-19.91	QP	
6		0.4695	15.30	9.84	25.14	46.52	-21.38	AVG	
7		10.1580	23.84	11.97	35.81	60.00	-24.19	QP	
8		10.1580	12.10	11.97	24.07	50.00	-25.93	AVG	
9		21.4665	28.38	13.99	42.37	60.00	-17.63	QP	
10		21.4665	17.60	13.99	31.59	50.00	-18.41	AVG	
11		27.7710	24.01	15.22	39.23	60.00	-20.77	QP	
12		27.7710	13.20	15.22	28.42	50.00	-21.58	AVG	

Test Voltage	AC 110V/60Hz	Phase	Neutral
Test Mode	Mode 4		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1500	43.20	9.77	52.97	66.00	-13.03	QP	
2		0.1500	32.50	9.77	42.27	56.00	-13.73	AVG	
3		0.1864	36.39	9.79	46.18	64.20	-18.02	QP	
4		0.1864	25.40	9.79	35.19	54.20	-19.01	AVG	
5		0.2310	31.33	9.80	41.13	62.41	-21.28	QP	
6		0.2310	20.60	9.80	30.40	52.41	-22.01	AVG	
7		0.4740	27.51	9.85	37.36	56.44	-19.08	QP	
8		0.4740	16.70	9.85	26.55	46.44	-19.89	AVG	
9		10.8600	26.15	12.15	38.30	60.00	-21.70	QP	
10		10.8600	15.10	12.15	27.25	50.00	-22.75	AVG	
11		20.7240	29.32	13.77	43.09	60.00	-16.91	QP	
12		20.7240	18.20	13.77	31.97	50.00	-18.03	AVG	

3.4 ASYMMETRIC MODE CONDUCTED EMISSIONS TEST

3.4.1 LIMITS

Requirements for asymmetric mode conducted emissions from Class B equipment

Frequency Range MHz	Coupling device	Detector type / Bandwidth	Class B voltage limits dB(μV)	Class B current limits dB(μA)
0.15 - 0.5	AAN	Quasi Peak / 9 kHz	84 - 74	n/a
0.5 - 30			74	
0.15 - 0.5	AAN	Average / 9 kHz	74 - 64	
0.5 - 30			64	

NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

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

Margin Level = Measurement Value – Limit Value

3.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	IMPEDANCE STABILIZATION NETWORK	TESEQ	ISN T800	60379	Jul. 07, 2024
2	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
3	Coaxial load	SHX	TF5-3	211020254	Feb. 09, 2024
4	TWO-LINE V-NETWORK	R&S	ENV216	102771	Sep. 24, 2024
5	EMI Test Receiver	R&S	ESCI	100895	Feb. 09, 2024
6	Cable	N/A	RG400	N/A	Mar. 06, 2024

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

All calibration period of equipment list is one year.

3.4.3 TEST PROCEDURE

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

NOTE:

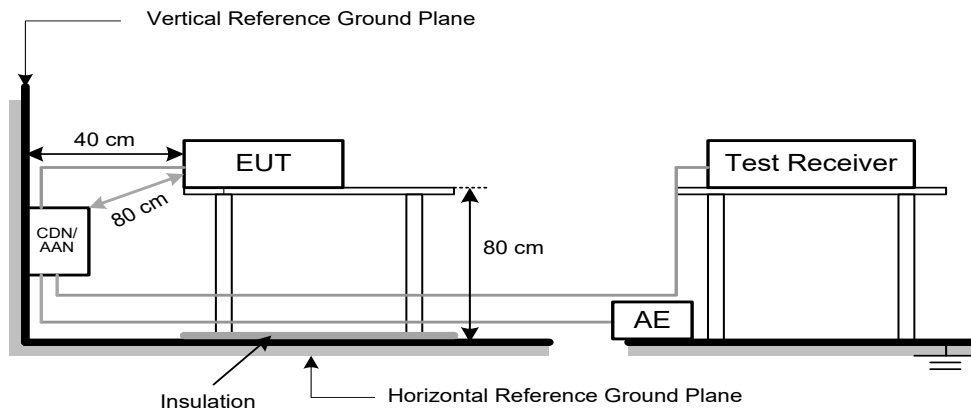
- The communication function of EUT was executed and AAN was connected between EUT and associated equipment and the AAN was connected directly to reference ground plane.
Measure the voltage at the measurement port of the AAN
Correct the measured voltage by adding the AAN voltage division factor
Compare the corrected voltage with the limit.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation

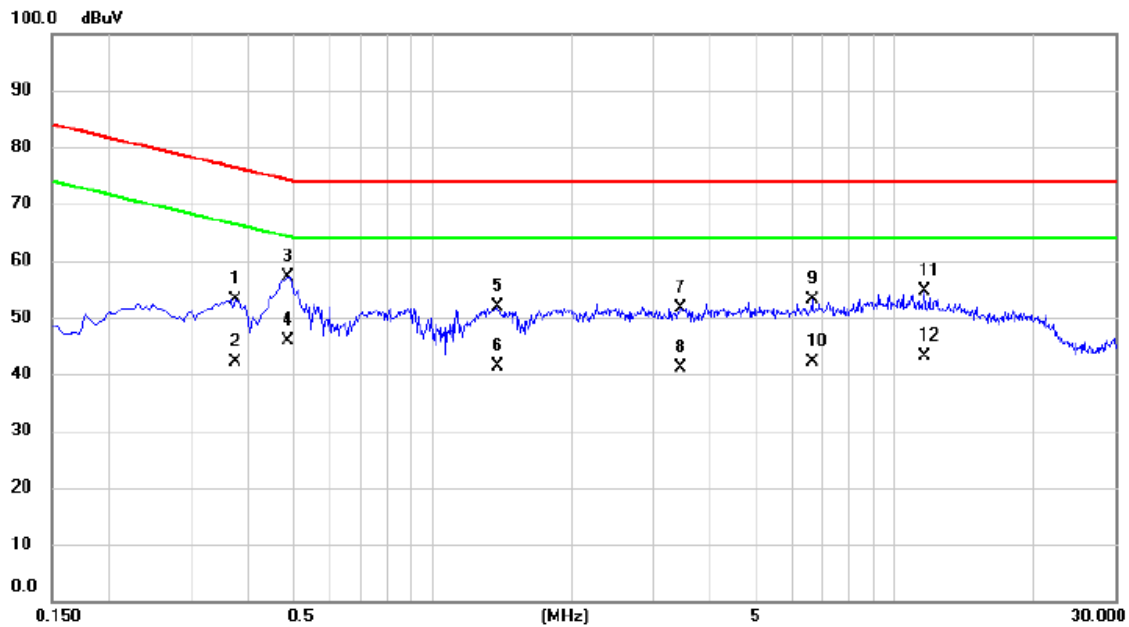
3.4.5 TEST SETUP

a) Cable Type: Balanced Unscreened, Screened or Coaxial



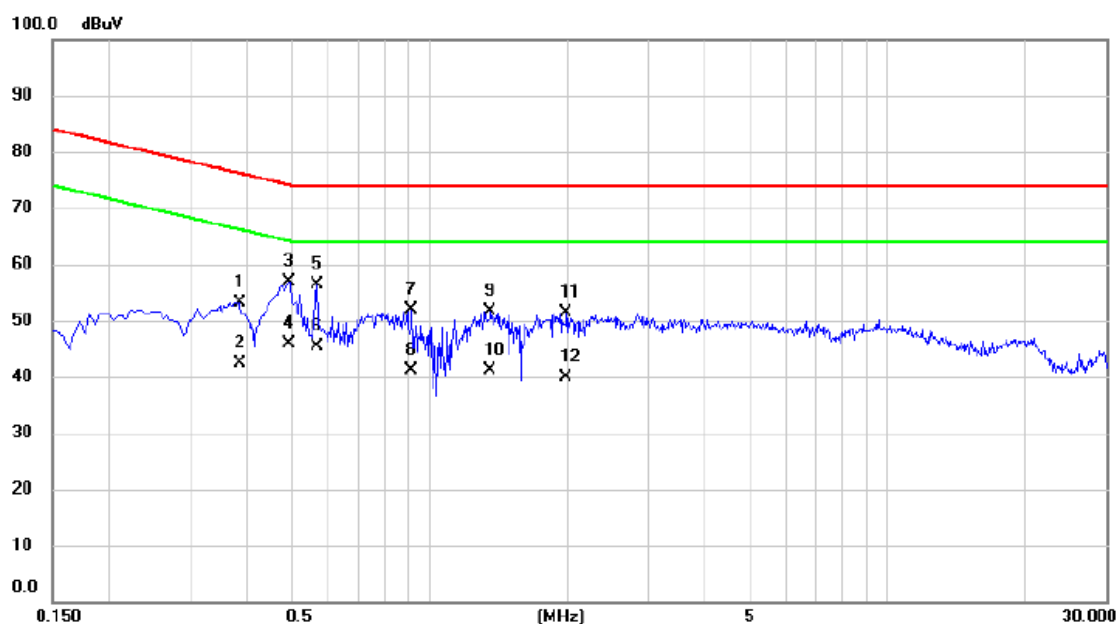
3.4.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 4(LAN1 1Gbps)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.3750	43.34	9.72	53.06	76.39	-23.33	QP	
2		0.3750	32.30	9.72	42.02	66.39	-24.37	AVG	
3	*	0.4875	47.41	9.68	57.09	74.21	-17.12	QP	
4		0.4875	36.10	9.68	45.78	64.21	-18.43	AVG	
5		1.3830	42.16	9.61	51.77	74.00	-22.23	QP	
6		1.3830	31.80	9.61	41.41	64.00	-22.59	AVG	
7		3.4395	42.06	9.64	51.70	74.00	-22.30	QP	
8		3.4395	31.50	9.64	41.14	64.00	-22.86	AVG	
9		6.6165	43.32	9.75	53.07	74.00	-20.93	QP	
10		6.6165	32.40	9.75	42.15	64.00	-21.85	AVG	
11		11.5980	44.70	9.88	54.58	74.00	-19.42	QP	
12		11.5980	33.20	9.88	43.08	64.00	-20.92	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Mode 4(WAN/LAN2 1Gbps)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.3840	43.52	9.71	53.23	76.19	-22.96	QP	
2		0.3840	32.60	9.71	42.31	66.19	-23.88	AVG	
3	*	0.4920	47.28	9.67	56.95	74.13	-17.18	QP	
4		0.4920	36.10	9.67	45.77	64.13	-18.36	AVG	
5		0.5685	46.78	9.67	56.45	74.00	-17.55	QP	
6		0.5685	35.70	9.67	45.37	64.00	-18.63	AVG	
7		0.9150	42.34	9.63	51.97	74.00	-22.03	QP	
8		0.9150	31.50	9.63	41.13	64.00	-22.87	AVG	
9		1.3560	42.01	9.61	51.62	74.00	-22.38	QP	
10		1.3560	31.40	9.61	41.01	64.00	-22.99	AVG	
11		1.9815	41.89	9.59	51.48	74.00	-22.52	QP	
12		1.9815	30.20	9.59	39.79	64.00	-24.21	AVG	

3.5 HARMONIC CURRENT EMISSIONS TEST

3.5.1 LIMITS

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

3.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonic current/voltage wave analyzer	EMC Partner	HAR1000-1P230V	103488-0270	Sep. 21, 2024
2	Measurement Software	EMC-PARTNER	Harmonics-1000	N/A	N/A

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

All calibration period of equipment list is one year.

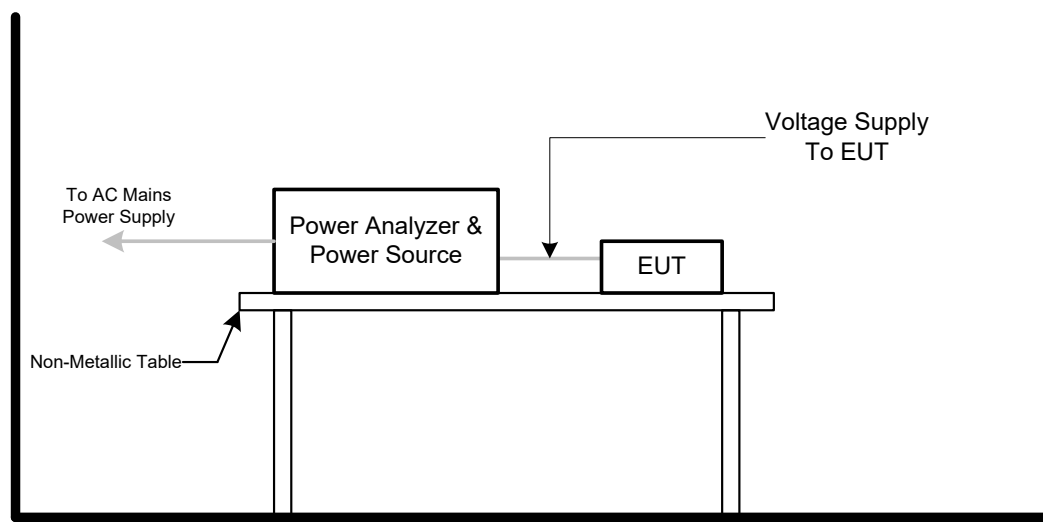
3.5.3 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- The classification of EUT is according to of EN IEC 61000-3-2. The EUT is classified as Class A.
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.5.4 DEVIATION FROM TEST STANDARD

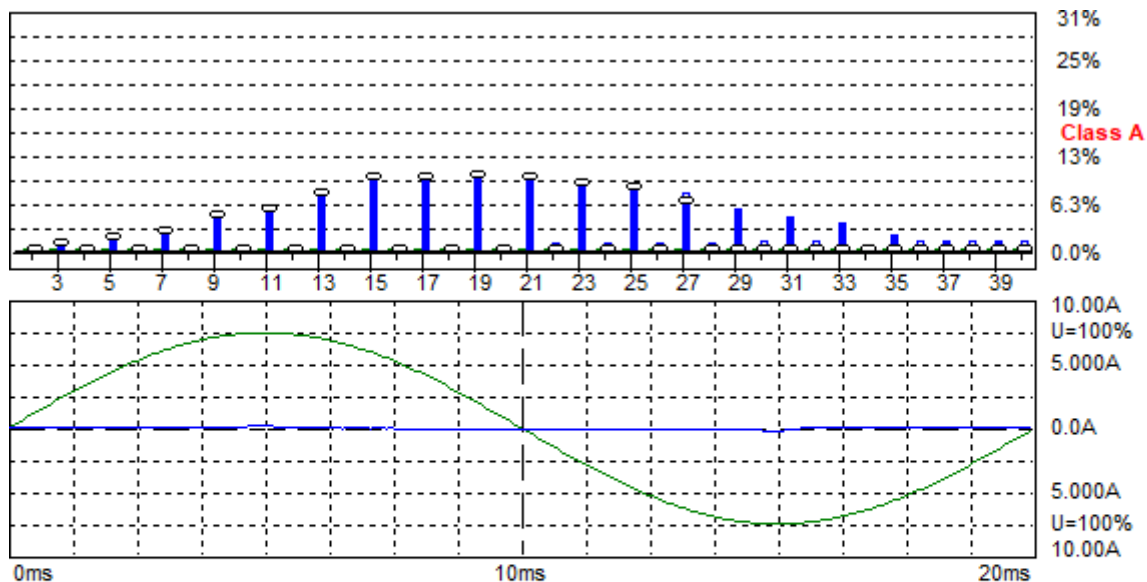
No deviation

3.5.5 TEST SETUP



3.5.6 TEST RESULTS

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



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2)

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Urms = 230.1 V P = 6.136 W THC = 0.053 A
Irms = 0.063 A pf = 0.420

Range: 10 A
V-nom: 230 V
TestTime: 3 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

Current Test Result Summary (Run time)

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

Urms = 230.1V Freq = 49.987 Range: 10 A
 Irms = 0.063A Ipik = 0.332A cf = 5.231
 P = 6.136W S = 14.61VA pf = 0.420
 THDi = 171 % THDu = 0.10 % Class A
 Test - Time : 3min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Irms [A]	Imax [A]	Limit [A]	Status	Vrms [V]	Vmax [V]	Limit [V]
1	50	0.0316	0.0317	0.0323			230.16	230.28	0.0000
2	100	0.0000	0.0006	0.0006	1.0800		0.1963	0.2209	0.4663
3	150	0.0196	0.0195	0.0201	2.3000		0.0736	0.0982	2.0615
4	200	0.0000	0.0006	0.0006	0.4300		0.0491	0.0491	0.4663
5	250	0.0194	0.0195	0.0201	1.1400		0.0491	0.0491	0.9081
6	300	0.0000	0.0006	0.0006	0.3000		0.0245	0.0491	0.4663
7	350	0.0190	0.0195	0.0195	0.7700		0.0245	0.0736	0.6872
8	400	0.0000	0.0006	0.0006	0.2300		0.0245	0.0245	0.4663
9	450	0.0184	0.0189	0.0189	0.4000		0.0245	0.0736	0.4663
10	500	0.0000	0.0006	0.0006	0.1840		0.0245	0.0245	0.4663
11	550	0.0178	0.0177	0.0183	0.3300		0.0245	0.0736	0.2209
12	600	0.0000	0.0006	0.0006	0.1533		0.0245	0.0245	0.2209
13	650	0.0154	0.0159	0.0159	0.2100		0.0245	0.0736	0.2209
14	700	0.0000	0.0006	0.0006	0.1314		0.0000	0.0245	0.2209
15	750	0.0140	0.0140	0.0146	0.1500		0.0000	0.0736	0.2209
16	800	0.0000	0.0006	0.0006	0.1150		0.0000	0.0245	0.2209
17	850	0.0129	0.0128	0.0134	0.1324		0.0245	0.0982	0.2209
18	900	0.0000	0.0006	0.0006	0.1022		0.0000	0.0245	0.2209
19	950	0.0115	0.0116	0.0116	0.1184		0.0245	0.0982	0.2209
20	1000	0.0000	0.0006	0.0006	0.0920		0.0000	0.0000	0.2209
21	1050	0.0102	0.0098	0.0104	0.1071		0.0245	0.0982	0.2209
22	1100	0.0000	0.0000	0.0006	0.0836		0.0000	0.0000	0.2209
23	1150	0.0085	0.0085	0.0085	0.0978		0.0000	0.0982	0.2209
24	1200	0.0000	0.0000	0.0006	0.0767		0.0000	0.0000	0.2209
25	1250	0.0073	0.0073	0.0073	0.0900		0.0000	0.0982	0.2209
26	1300	0.0000	0.0000	0.0006	0.0708		0.0000	0.0000	0.2209
27	1350	0.0055	0.0055	0.0061	0.0833		0.0000	0.0982	0.2209
28	1400	0.0000	0.0000	0.0006	0.0657		0.0000	0.0000	0.2209
29	1450	0.0000	0.0043	0.0043	0.0776		0.0000	0.0982	0.2209
30	1500	0.0000	0.0000	0.0006	0.0613		0.0000	0.0000	0.2209
31	1550	0.0000	0.0031	0.0031	0.0726		0.0000	0.0736	0.2209
32	1600	0.0000	0.0000	0.0006	0.0575		0.0000	0.0000	0.2209
33	1650	0.0000	0.0024	0.0024	0.0682		0.0000	0.0736	0.2209
34	1700	0.0000	0.0000	0.0000	0.0541		0.0000	0.0245	0.2209
35	1750	0.0000	0.0012	0.0012	0.0643		0.0000	0.0736	0.2209
36	1800	0.0000	0.0000	0.0006	0.0511		0.0000	0.0000	0.2209
37	1850	0.0000	0.0006	0.0006	0.0608		0.0000	0.0736	0.2209
38	1900	0.0000	0.0000	0.0006	0.0484		0.0000	0.0245	0.2209
39	1950	0.0000	0.0006	0.0006	0.0577		0.0245	0.0491	0.2209
40	2000	0.0000	0.0000	0.0006	0.0460		0.0000	0.0245	0.2209

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

Order	Limits in Ampere			
	90%	100%	150%	200%
2	0.9717	1.0797	1.6196	2.1594
3	2.0698	2.2998	3.4497	4.5996
4	0.3873	0.4303	0.6454	0.8606
5	1.0261	1.1401	1.7102	2.2803
6	0.2703	0.3003	0.4504	0.6006
7	0.6932	0.7703	1.1554	1.5405
8	0.2071	0.2301	0.3452	0.4602
9	0.3598	0.3998	0.5997	0.7996
10	0.1653	0.1837	0.2756	0.3674
11	0.2972	0.3302	0.4953	0.6604
12	0.1379	0.1532	0.2298	0.3064
13	0.1890	0.2100	0.3149	0.4199
14	0.1181	0.1312	0.1968	0.2625
15	0.1351	0.1501	0.2252	0.3003
16	0.1033	0.1147	0.1721	0.2295
17	0.1192	0.1324	0.1987	0.2649
18	0.0917	0.1019	0.1529	0.2039
19	0.1066	0.1184	0.1776	0.2368
20	0.0829	0.0922	0.1382	0.1843
21 *	0.0967	0.1074	0.1611	0.2148
22	0.0753	0.0836	0.1254	0.1672
23 *	0.0879	0.0977	0.1465	0.1953
24	0.0692	0.0769	0.1154	0.1538
25 *	0.0807	0.0897	0.1346	0.1794
26	0.0637	0.0708	0.1062	0.1416
27 *	0.0753	0.0836	0.1254	0.1672
28	0.0593	0.0659	0.0989	0.1318
29 *	0.0698	0.0775	0.1163	0.1550
30	0.0549	0.0610	0.0916	0.1221
31 *	0.0654	0.0726	0.1089	0.1453
32	0.0516	0.0574	0.0861	0.1147
33 *	0.0615	0.0684	0.1025	0.1367
34	0.0489	0.0543	0.0815	0.1086
35 *	0.0577	0.0641	0.0961	0.1282
36	0.0461	0.0513	0.0769	0.1025
37 *	0.0549	0.0610	0.0916	0.1221
38	0.0434	0.0482	0.0723	0.0964
39 *	0.0522	0.0580	0.0870	0.1160
40	0.0412	0.0458	0.0687	0.0916

3.6 VOLTAGE FLUCTUATIONS (FLICKER) TEST

3.6.1 LIMITS

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

3.6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonic current/voltage wave analyzer	EMC Partner	HAR1000-1P230V	103488-0270	Sep. 21, 2024
2	Measurement Software	EMC-PARTNER	Harmonics-1000	N/A	N/A

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

All calibration period of equipment list is one year.

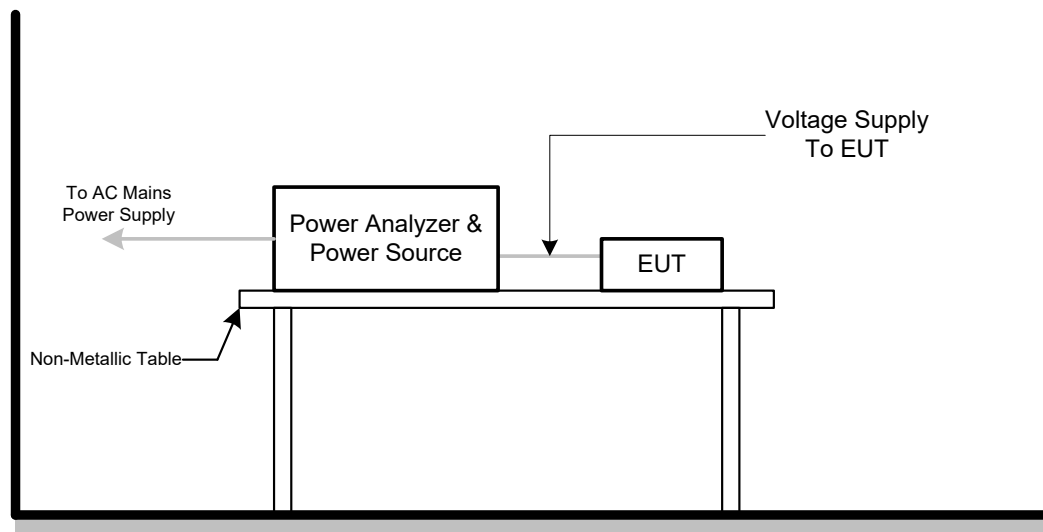
3.6.3 TEST PROCEDURE

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

3.6.4 DEVIATION FROM TEST STANDARD

No deviation

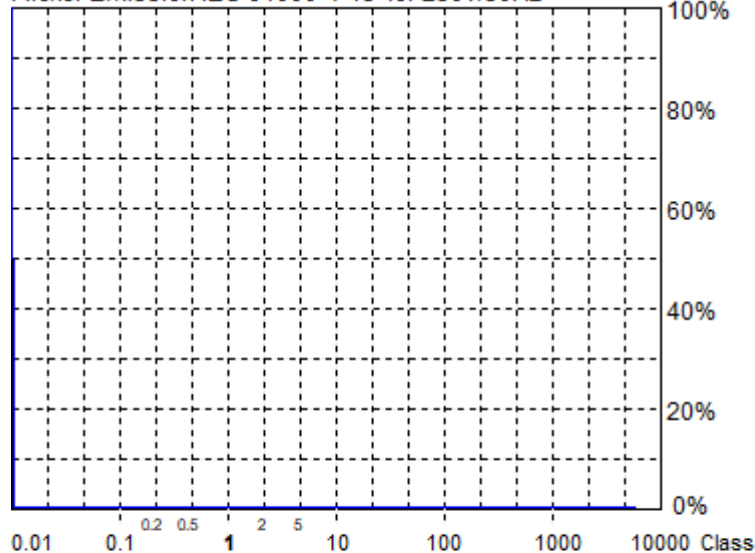
3.6.5 TEST SETUP



3.6.6 TEST RESULTS

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

Flicker Emission IEC 61000-4-15 for 230V/50Hz



Actual Flicker (Fli):	0.00
Short-term Flicker (Pst):	0.07
Limit (Pst):	1.00
Long-term Flicker (Plt):	0.07
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	0.00%
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	0.01%
Limit (dc):	3.30%
Tmax 3.00% (dt):	0.00ms
Limit (dt>Lim):	500ms

Flicker Emission - IEC 61000-3-3, EN 61000-3-3

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Urms = 230.1 V P = 6.136 W
Irms = 0.063 A pf = 0.420

Range: 10 A
V-nom: 230 V
TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Driver

Urms = 230.1V Freq = 50.039 Range: 10 A
Irms = 0.063A Ipk = 0.327A cf = 5.154
P = 6.136W S = 14.61VA pf = 0.420

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.00 % dt>Lim: 500ms

Test completed, Result: PASSED

	Pst	P3s	Fli	dmax
				[%]
1	0.072	0.010	0.000	0.000

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

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

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

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

Note.

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

4.2 GENERAL PERFORMANCE CRITERIA

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

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

4.3 ANNEX F (NORMATIVE) - NETWORKING FUNCTION

4.3.1 GENERAL PERFORMANCE CRITERIA FOR NETWORK FUNCTIONS

Performance criterion A:

Where relevant, during the application of the test the network function shall, as a minimum, operate ensuring that:

- established connections shall be maintained throughout the application of the test;
- no change of operational state or corruption of stored data occurs;
- no increase in error rate above the figure defined by the manufacturer occurs. The manufacturer should select the most appropriate performance measurement criteria for the product or system, for example bit error rate, block error rate;
- no request for retry above the figure defined by the manufacturer;
- the data transmission rate does not reduce below the figure defined by the manufacturer;
- no protocol failure occurs;
- the audio noise level at a two-wire analogue interface (supporting telephony) shall satisfy the requirements of Table G.3. The audio level measurements shall be performed at the demodulated frequency of the disturbance using a narrowband filter with a 3 dB bandwidth of 100 Hz using the method defined in table clause G.1.4. See G.6.1.

As described in the example given in J.3.5 the networking function is monitored during testing using direct functions specified elsewhere in this document.

If needed to verify the operation of the protocol, the following functions shall be verified as described in Table H.1 when performing the additional spot frequency tests:

- ability to establish a connection,
- ability to clear a connection.

Where an EUT has supervisory functions they shall not be affected. Elements that should be monitored include, but are not limited to:

- alarms,
- signalling lamps,
- printer output errors,
- network traffic rates,
- network monitor errors,
- measured network parameters.

Performance criterion B:

Established connections shall be maintained throughout the test, or shall self-recover in a way and timescale that is imperceptible to the user.

The error rate, request for retry and data transmission rates may be degraded during the application of the test. Degradation of the performance as described in criterion A is permitted, provided that the normal operation of the EUT is self-recoverable to the condition established prior to the application of the test.

Where required, the acceptable operation of the function shall be verified at the completion of the test as described in Table H.1, by confirming the following:

- the EUT's ability to establish a connection,
- the EUT's ability to clear a connection.

During surge testing disconnection is allowed on the analogue/digital data port being tested.

If the EUT is a supervisory equipment, it shall not impact the normal operation of the network being monitored. In addition, any supervisory functions impacted during the period of the test shall return to the state prior to the test. Elements to consider include:

- alarms,
- signalling lamps,
- printer output,
- network traffic rates,
- network monitoring.

Performance criterion C:

Degradation of performance as described in criteria A and B is permitted provided that the normal operation of the EUT is self-recoverable to the condition immediately before the application of the test, or can be restored after the test by the operator.

4.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.4.1 TEST SPECIFICATION

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

4.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Generator	TESEQ AG	NSG 437	450	Nov. 12, 2024

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

All calibration period of equipment list is one year.

4.4.3 TEST PROCEDURE

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

- a. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied.

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

For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

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

Vertical Coupling Plane (VCP):

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

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

Horizontal Coupling Plane (HCP):

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

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

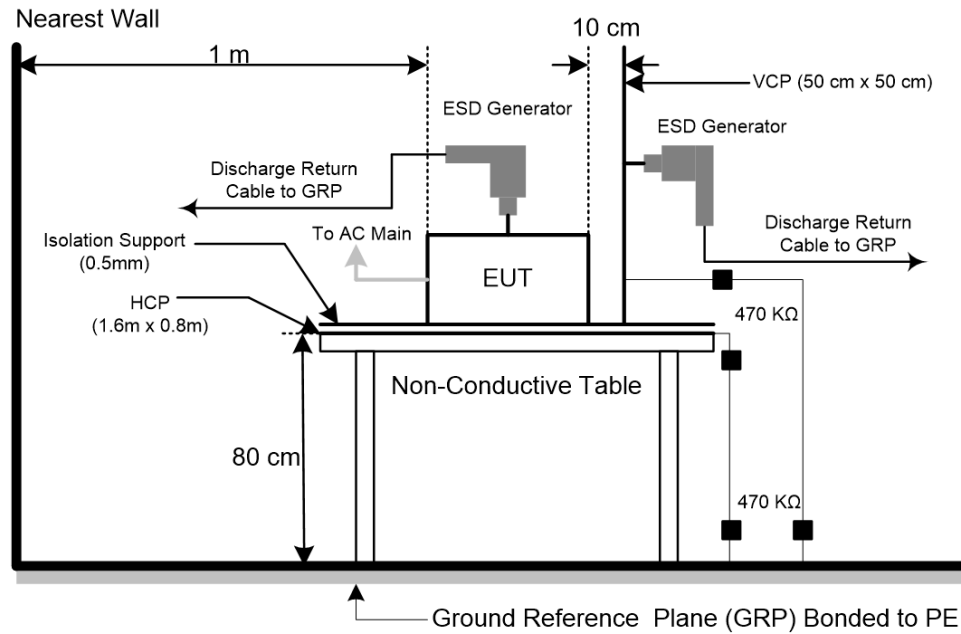
- b. For TABLE-TOP equipment:

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

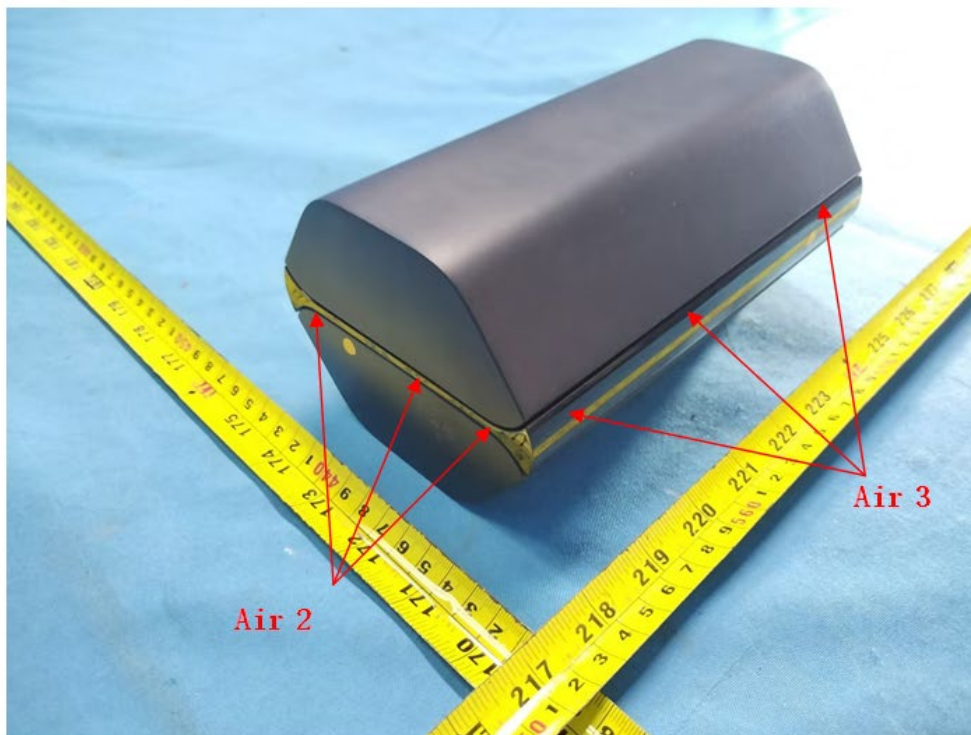
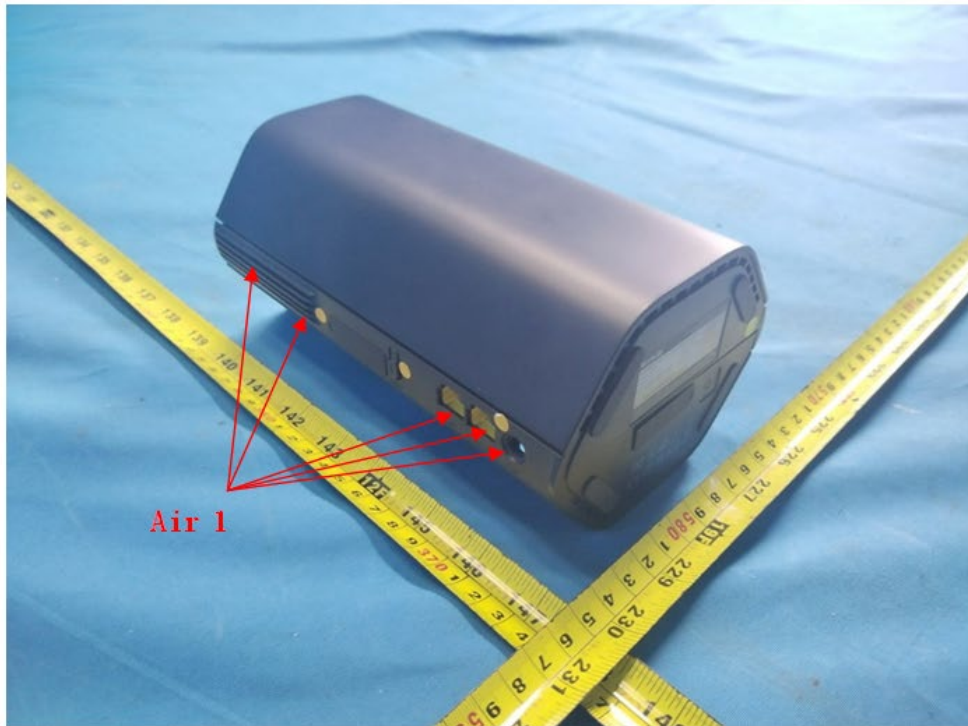
Mode	Air Discharge								Contact Discharge					
	2kV		4kV		8kV		- kV		4kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	A	-	-	-	-	-	-	-	-
2	A	A	A	A	A	A	-	-	-	-	-	-	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-
4	A	A	A	A	A	A	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B						-		B				-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

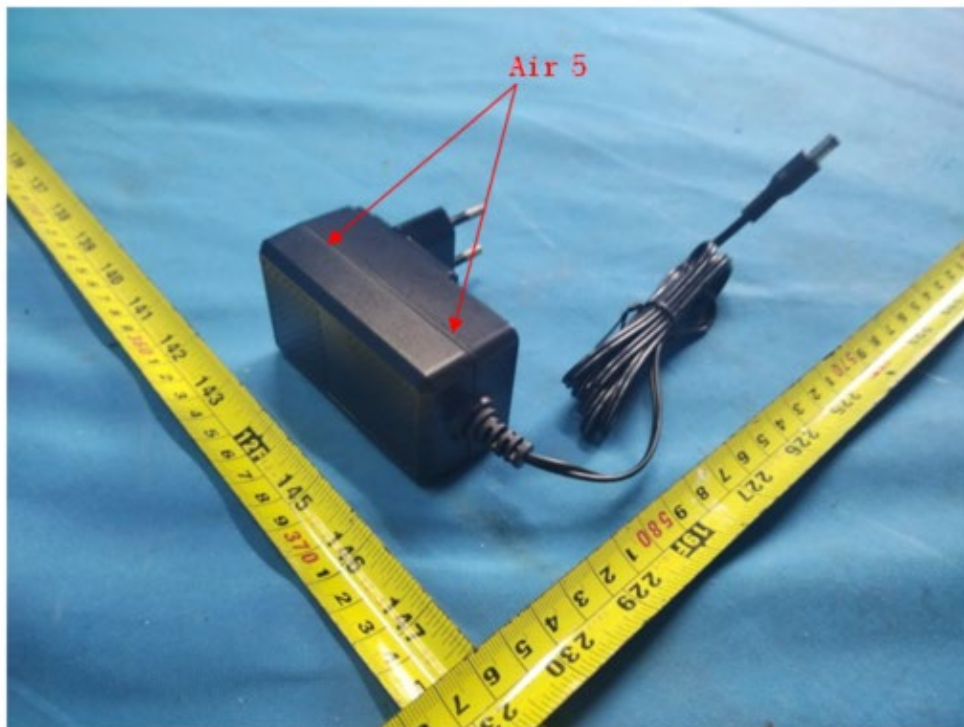
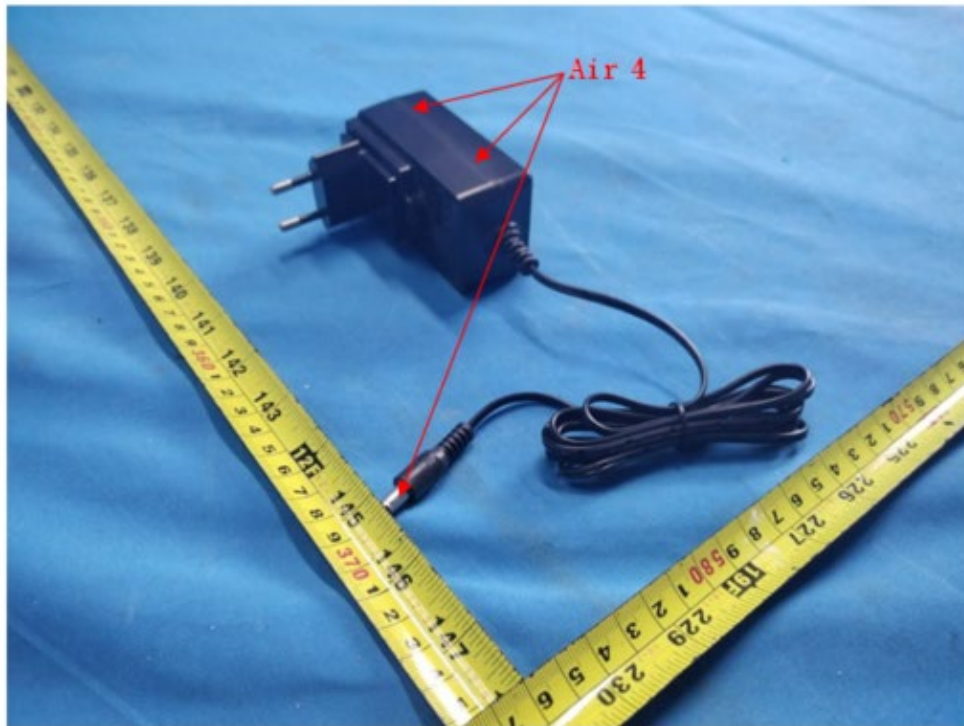
Mode	HCP Contact Discharge						VCP Contact Discharge					
	4kV		- kV		- kV		4kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N
Left side	B	B	-	-	-	-	B	B	-	-	-	-
Right side	B	B	-	-	-	-	B	B	-	-	-	-
Front side	B	B	-	-	-	-	B	B	-	-	-	-
Rear side	B	B	-	-	-	-	B	B	-	-	-	-
Criteria	B				-		B				-	
Result	B		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

Note:

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

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





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

4.5.1 TEST SPECIFICATION

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

4.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	ETS	3142C	66462	Mar. 25, 2024
2	Amplifier	AR	50S1G4A	326720	Dec. 22, 2024
3	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Jun. 17, 2024
4	Power amplifier	MILMEGA	AS1860-50	1064834	Dec. 22, 2024
5	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9149	9149-277	Apr. 14, 2024
6	Power amplifier	MILMEGA	80RF1000-250	1064833	Dec. 22, 2024
7	Measurement Software	Farad	(EZ-RS)V2.0.1.3	N/A	N/A

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

All calibration period of equipment list is one year.

4.5.3 TEST PROCEDURE

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

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

For TABLE-TOP equipment:

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

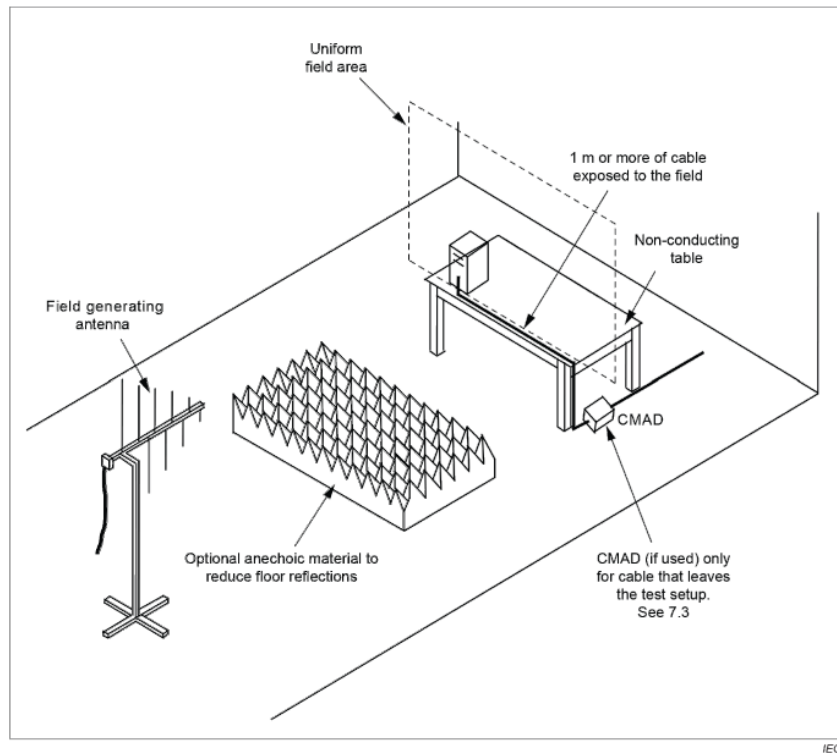
- The field strength level was 3 V/m(unmodulated, r.m.s).
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. Where the frequency range is swept incrementally, the step size was 1% of the preceding frequency.
- The dwell time at each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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP

a) For Continuous induced RF disturbances



4.5.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

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

4.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

4.6.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-4
Required Performance	B
Test Voltage	AC mains power ports: ± 1 kV Analogue/digital data ports: ± 0.5 kV
Polarity	Positive & Negative
Impulse Frequency	5 kHz
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	1 min.

4.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Fast Transient Burst Simulator	Prima	EFT61004TA	PR190741004	Jun. 16, 2024
2	Measurement Software	Prima	EFT_Series V1.0.0.0.20180710	N/A	N/A

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

All calibration period of equipment list is one year.

4.6.3 TEST PROCEDURE

For TABLE-TOP equipment:

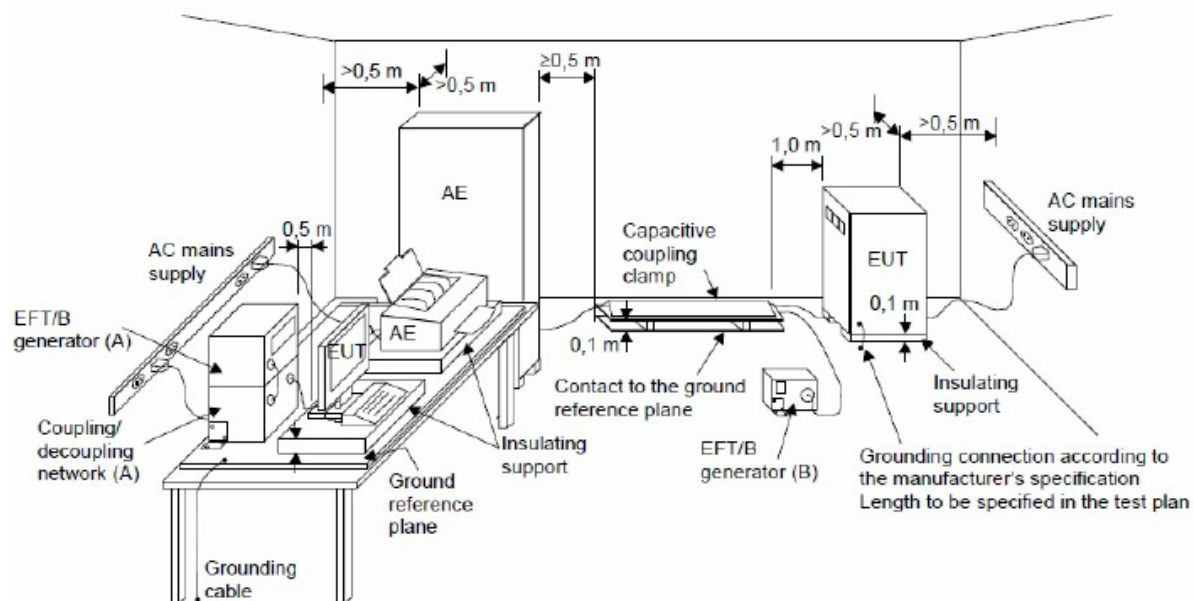
The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m \pm 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum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

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

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

EUT Ports Tested		Polarity	Repetition Frequency	Test Level 0.5 kV	Criterion	Result
Analogue/digital data ports	LAN1	+	5 kHz	B	B	B
		-	5 kHz	B		
	WAN/LAN2	+	5 kHz	B	B	B
		-	5 kHz	B		

4.7 SURGE IMMUNITY TEST (SURGE)

4.7.1 TEST SPECIFICATION

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

4.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Lightning Surge Generator	Prima	SUG61005TB	PR190854067	Jun. 16, 2024
2	Measurement Software	Prima	SUG_Series V1.0.0.7.20190827	N/A	N/A

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

All calibration period of equipment list is one year.

4.7.3 TEST PROCEDURE

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 2meters in length (or shorter).

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

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

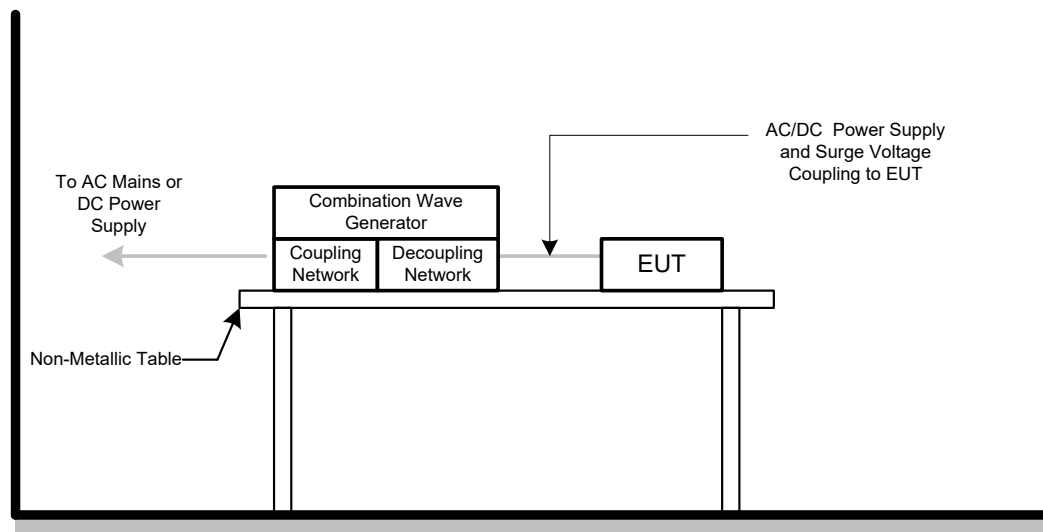
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT :

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

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

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

4.8.1 TEST SPECIFICATION

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

4.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TEST SYSTEM FOR CONDUCTED AND RADIATED IMMUNITY	TESEQ	NSG 4070B	37513	Jun. 16, 2024
2	Attenuator	Teseq	100-SA-FFN-06	163357	Jun. 16, 2024
3	Measurement Software	Farad	EZ-CS (V2.0.1.4)	N/A	N/A
4	Power CDN	FCC	FCC-801-M2/M3-16A	100270	Dec. 22, 2024
5	Coupling Decoupling Network	Teseq GmbH	CDN M016	35834	Jun. 16, 2024
6	Coupling Decoupling Network	Teseq GmbH	CDN T8-10	40373	Jun. 16, 2024

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

All calibration period of equipment list is one year.

4.8.3 TEST PROCEDURE

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

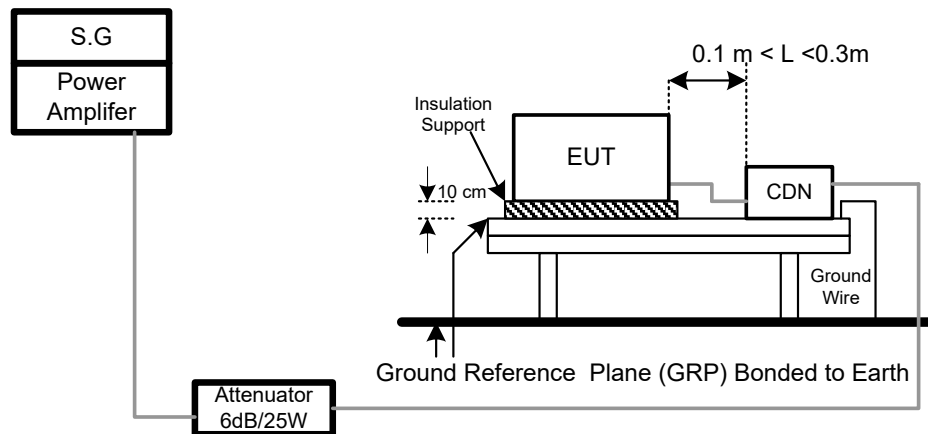
The other condition as following manner:

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

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



4.8.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

Test Ports (Mode)	Freq.Range (MHz)	Field Strength	Modulation	Criteria	Results
AC mains power ports	0.15 - 10	3V	AM Modulated 1000Hz, 80%	A	A
	10 - 30	3V to 1V			
	30 - 80	1V			
Analogue/digital data ports (LAN1)	0.15 - 10	3V	AM Modulated 1000Hz, 80%	A	A
	10 - 30	3V to 1V			
	30 - 80	1V			
Analogue/digital data ports (WAN/LAN2)	0.15 - 10	3V	AM Modulated 1000Hz, 80%	A	A
	10 - 30	3V to 1V			
	30 - 80	1V			

4.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

4.9.1 TEST SPECIFICATION

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

4.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field test Generator	FCC	F-1000-4-8-G-125A	4032	Dec. 22, 2024
2	Magnetic Field immunity loop	Thermo KeyTek	F-1000-4-8/9/10-L-1M	4024	Dec. 22, 2024

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

All calibration period of equipment list is one year.

4.9.3 TEST PROCEDURE

For TABLE-TOP equipment:

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

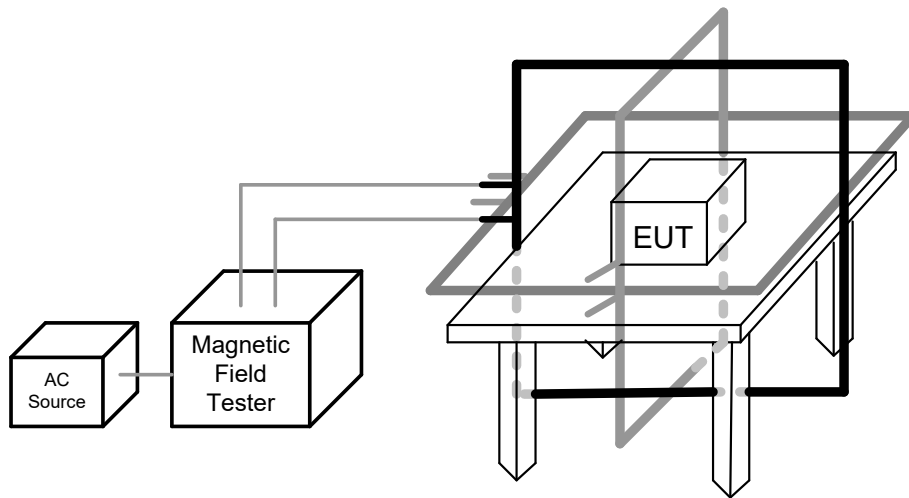
The other condition as following manner:

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

4.9.4 DEVIATION FROM TEST STANDARD

No deviation

4.9.5 TEST SETUP



4.9.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Mode 1-5

50Hz

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

60Hz

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

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

4.10.1 TEST SPECIFICATION

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

4.10.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Cycle Sag Simulator	Prima	DRP61011TA	PR19076452	Jun. 16, 2024

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

All calibration period of equipment list is one year.

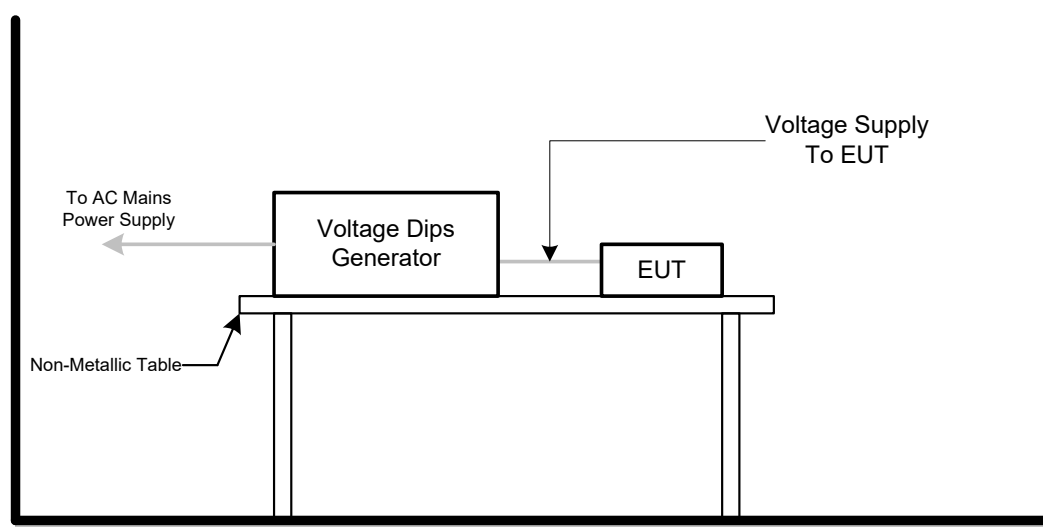
4.10.3 TEST PROCEDURE

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

4.10.4 DEVIATION FROM TEST STANDARD

No deviation

4.10.5 TEST SETUP



4.10.6 TEST RESULTS

Test Voltage	AC 100V/50Hz, AC 230V/50Hz, AC 240V/50Hz
Test Mode	Mode 1-5

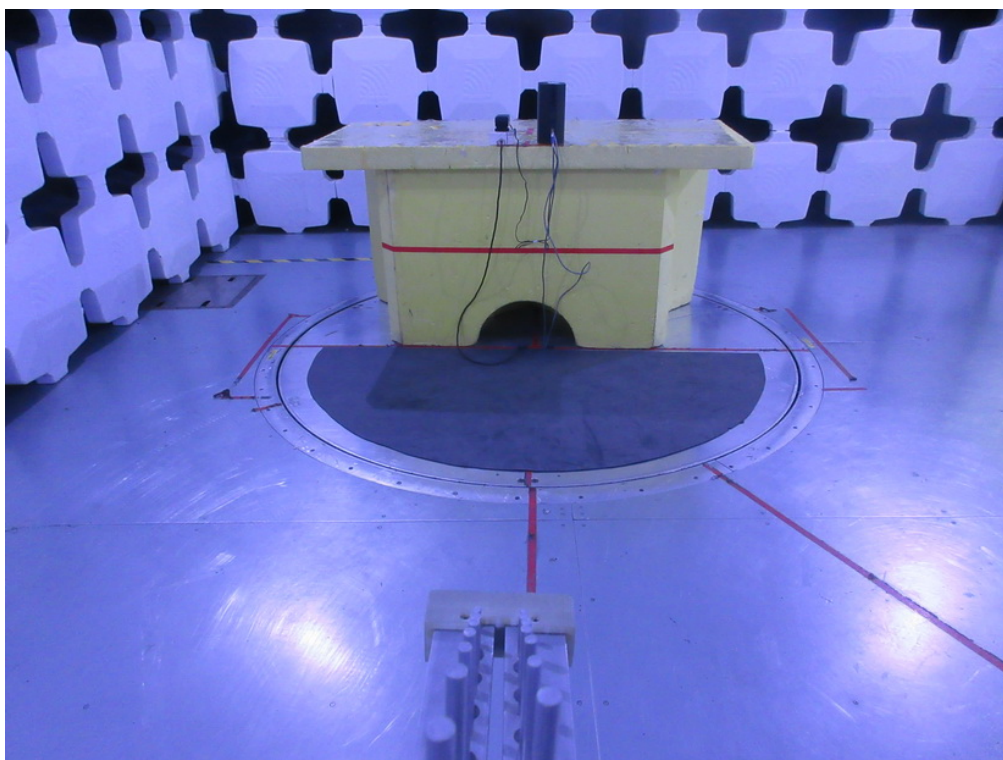
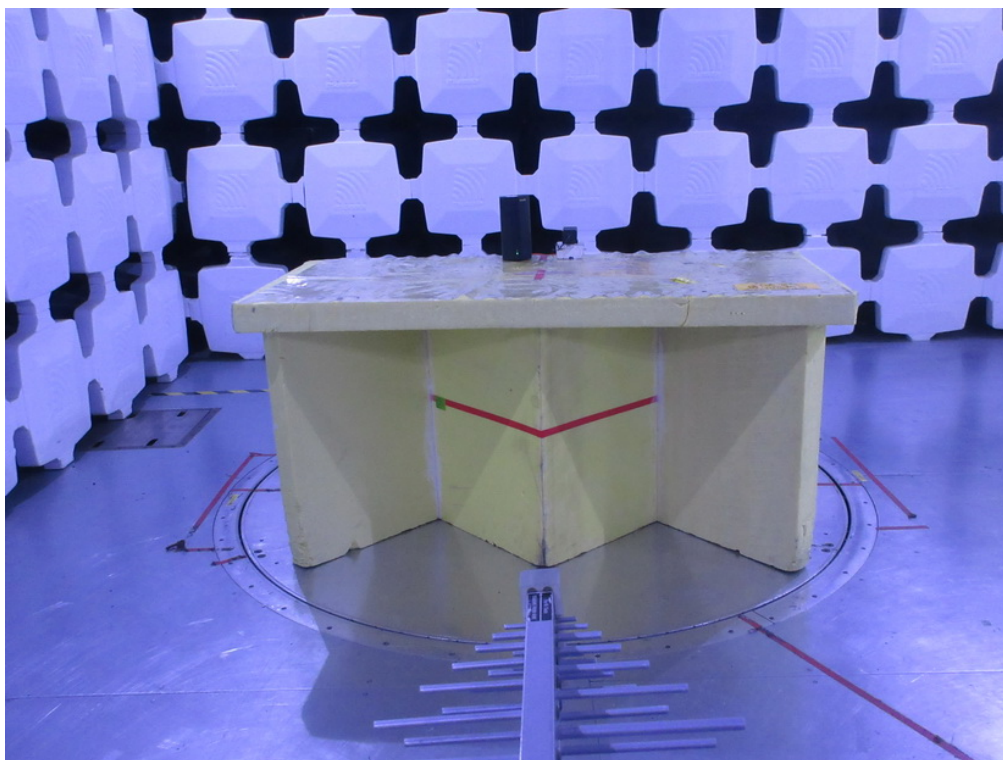
AC 100V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	C

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

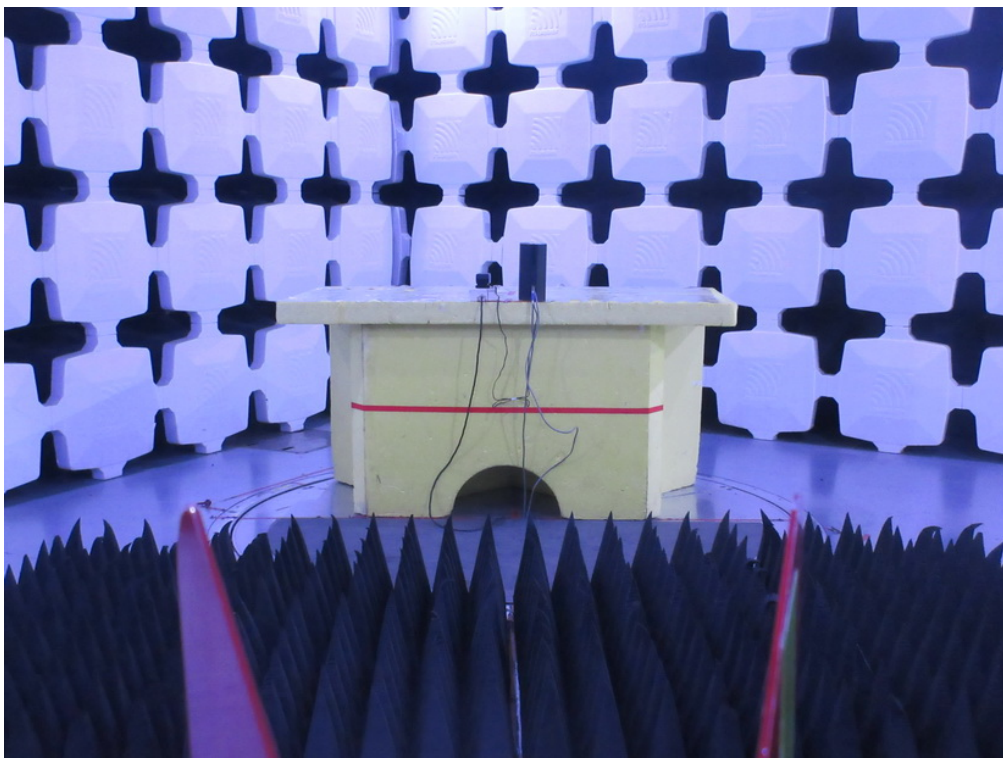
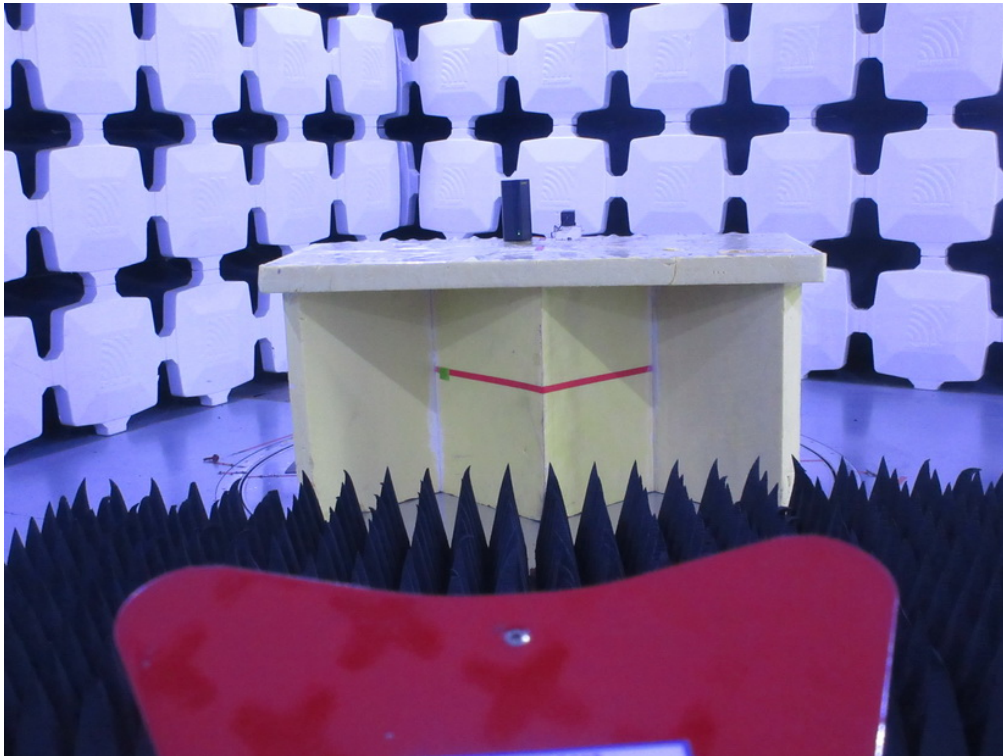
AC 240V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	C

5. EUT TEST PHOTO

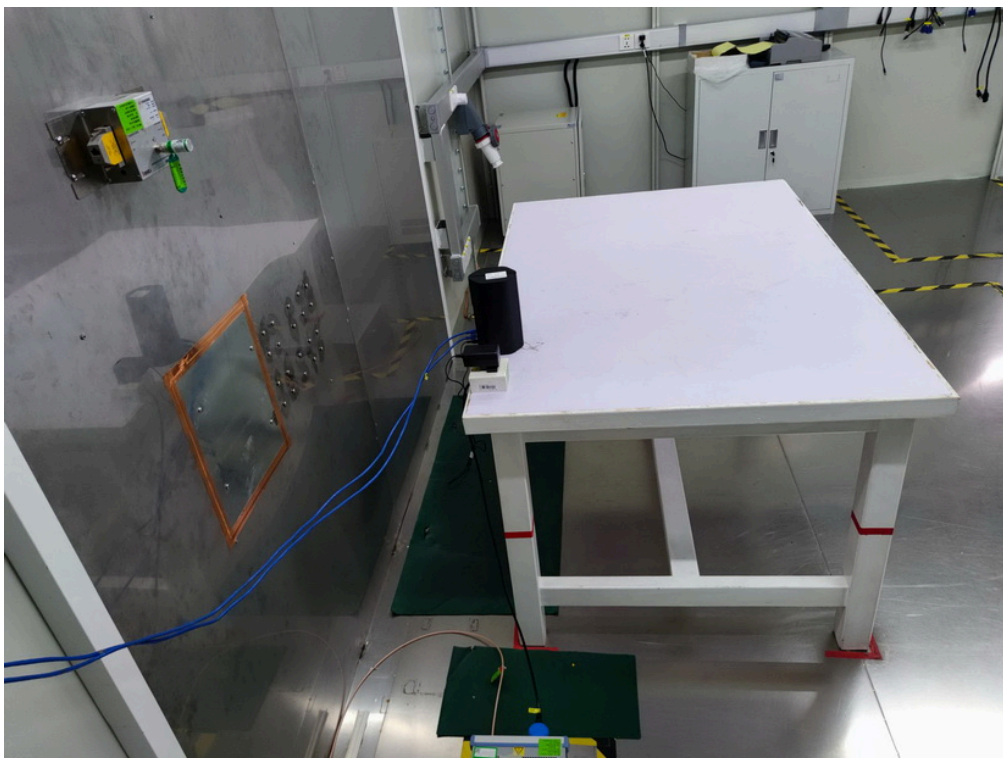
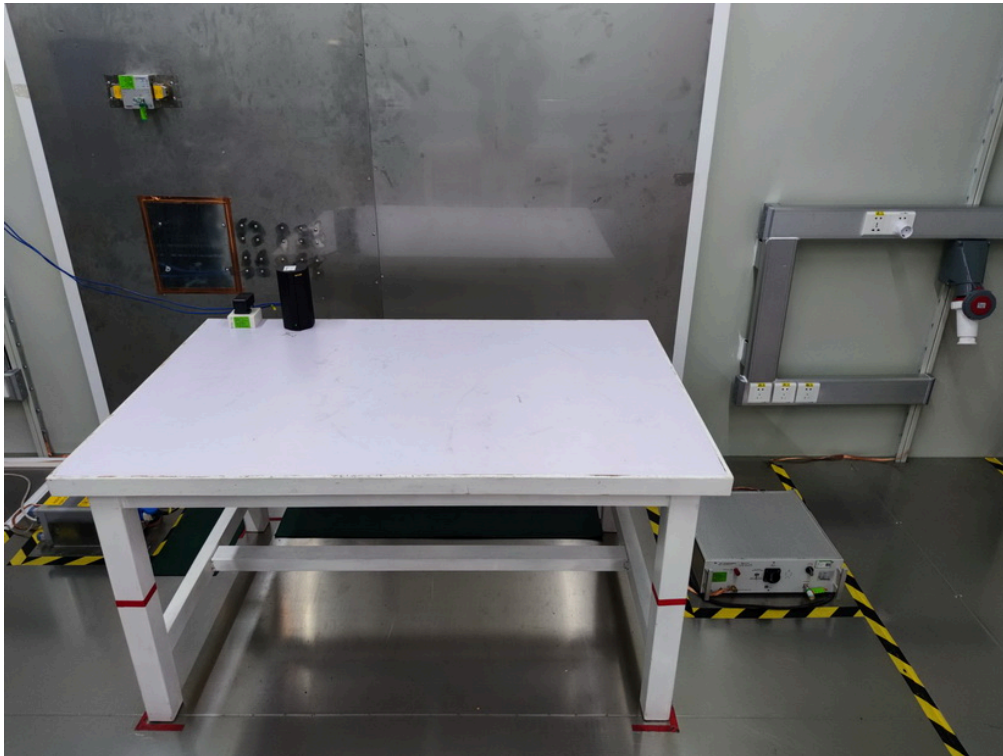
Radiated emissions up to 1 GHz



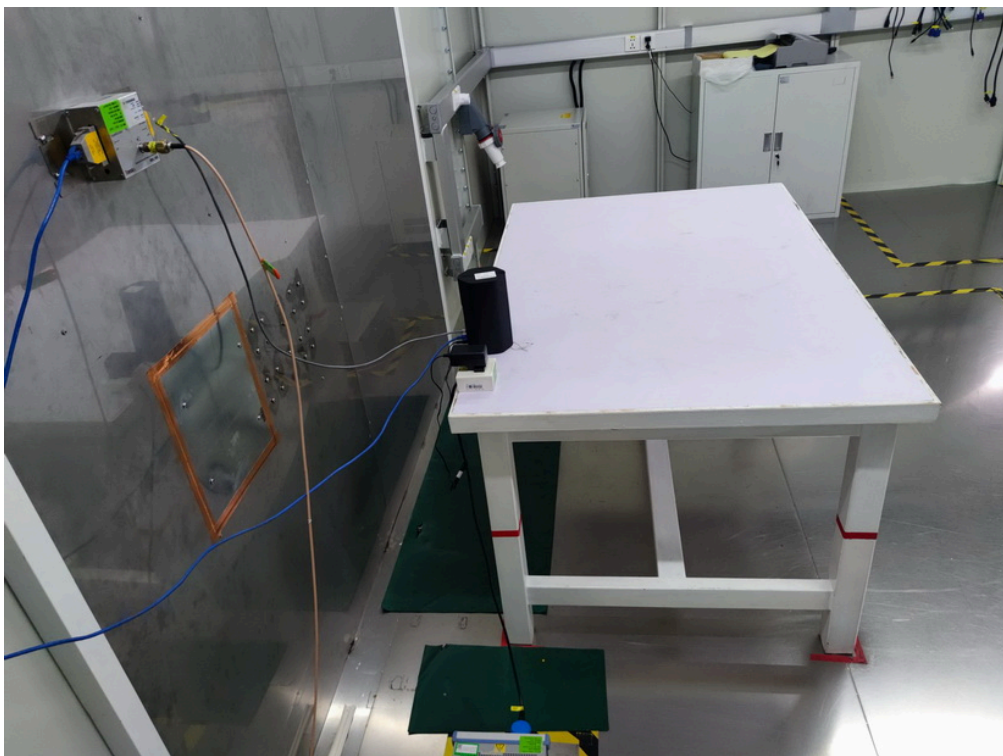
Radiated emissions above 1 GHz



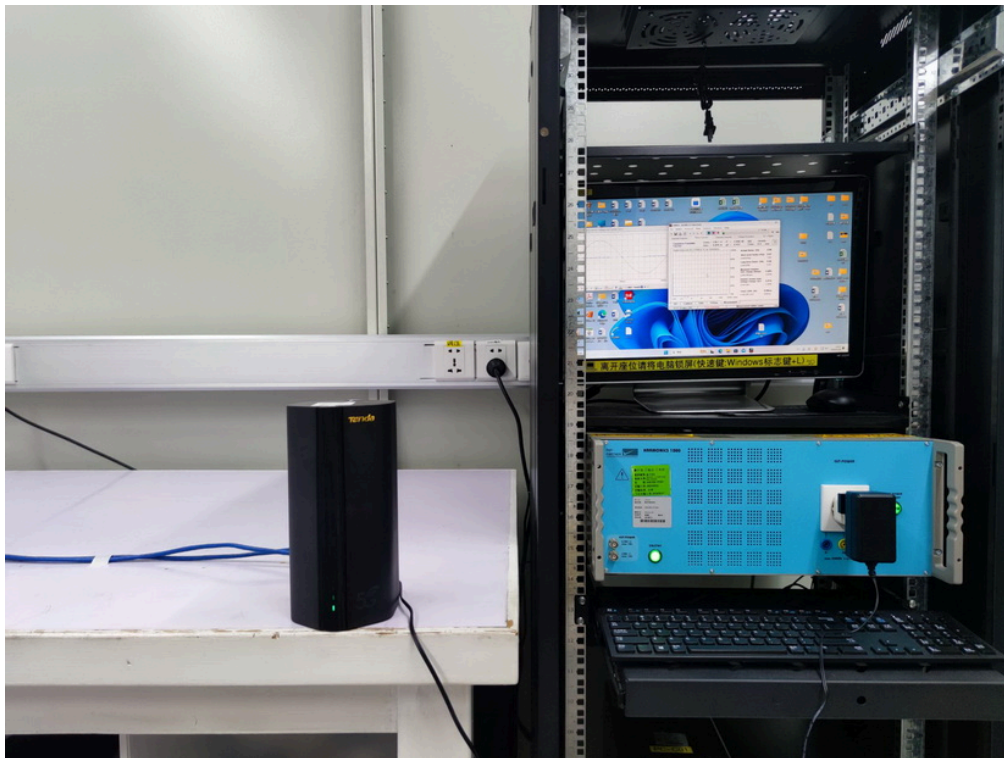
Conducted emissions AC mains power port



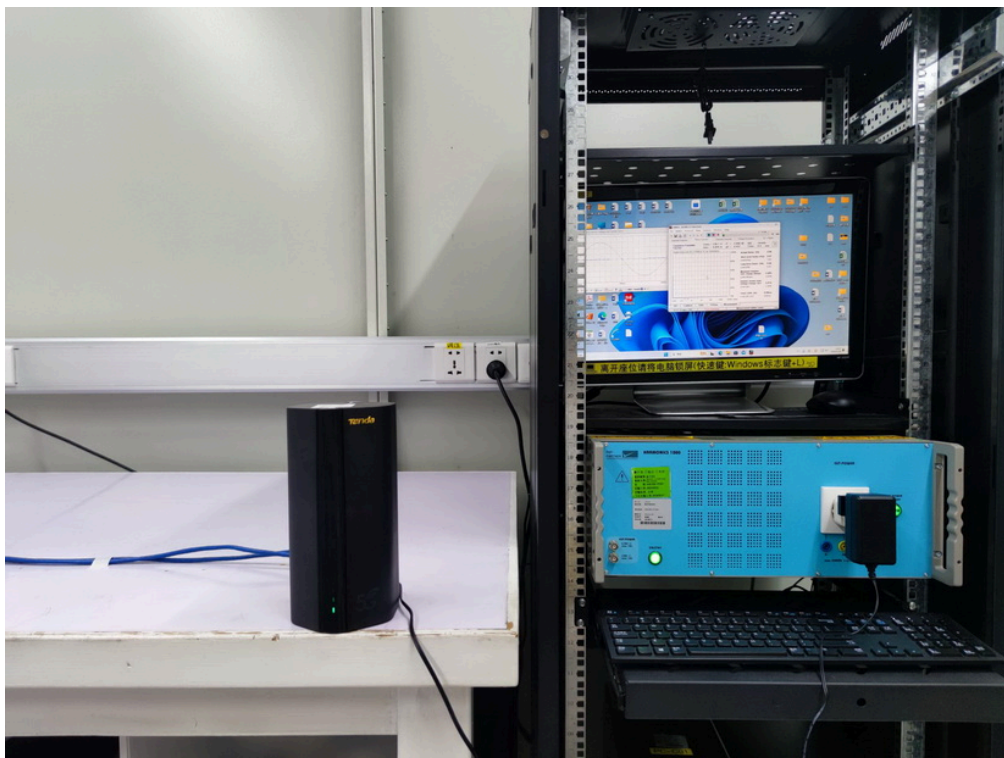
Asymmetric mode conducted emissions(RJ45)



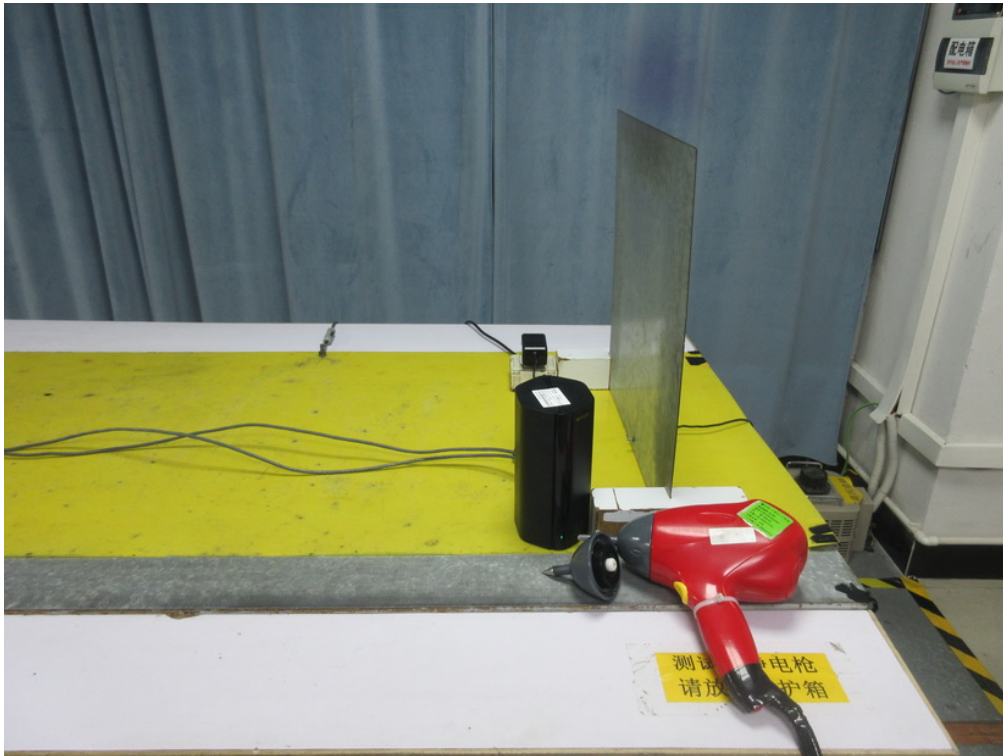
Harmonic current



Voltage fluctuations (Flicker)



Electrostatic discharge immunity



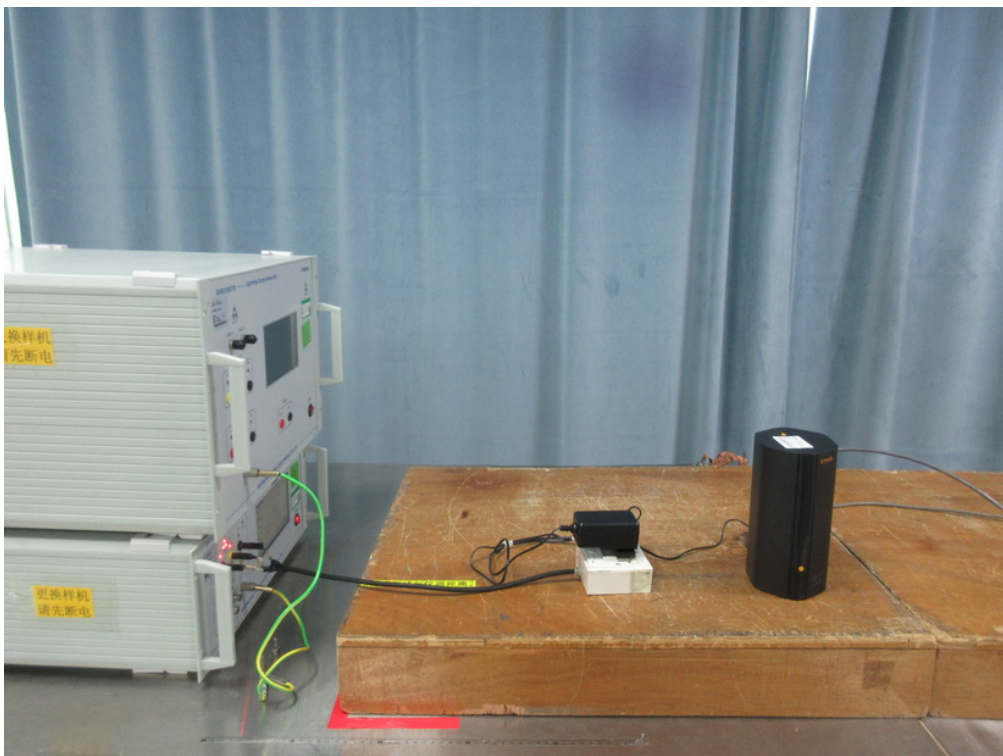
Radiated, radio-frequency, electromagnetic field immunity – Up to 1GHz



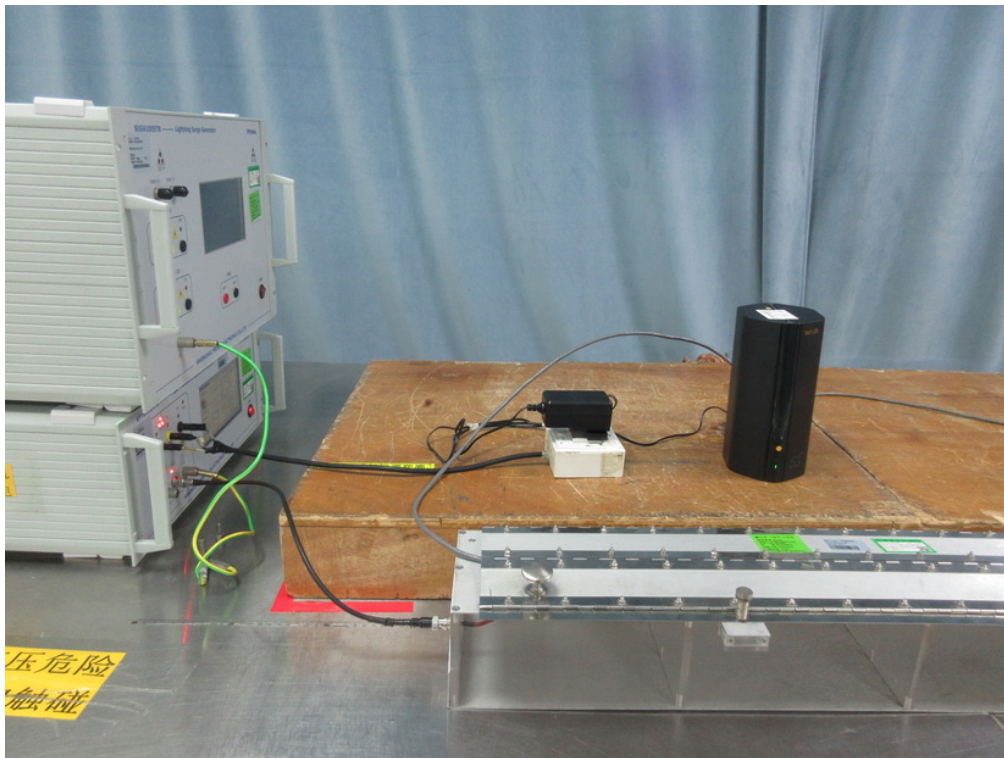
Radiated, radio-frequency, electromagnetic field immunity – Above 1GHz



Electrical fast transient/burst immunity - AC



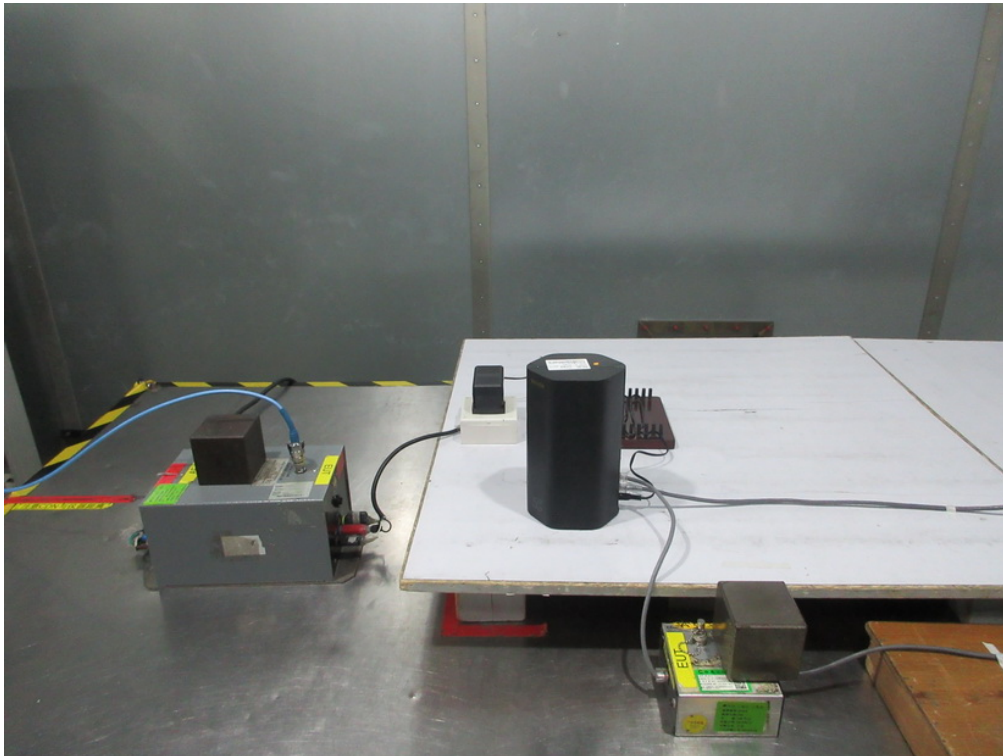
Electrical fast transient/burst immunity(RJ45)



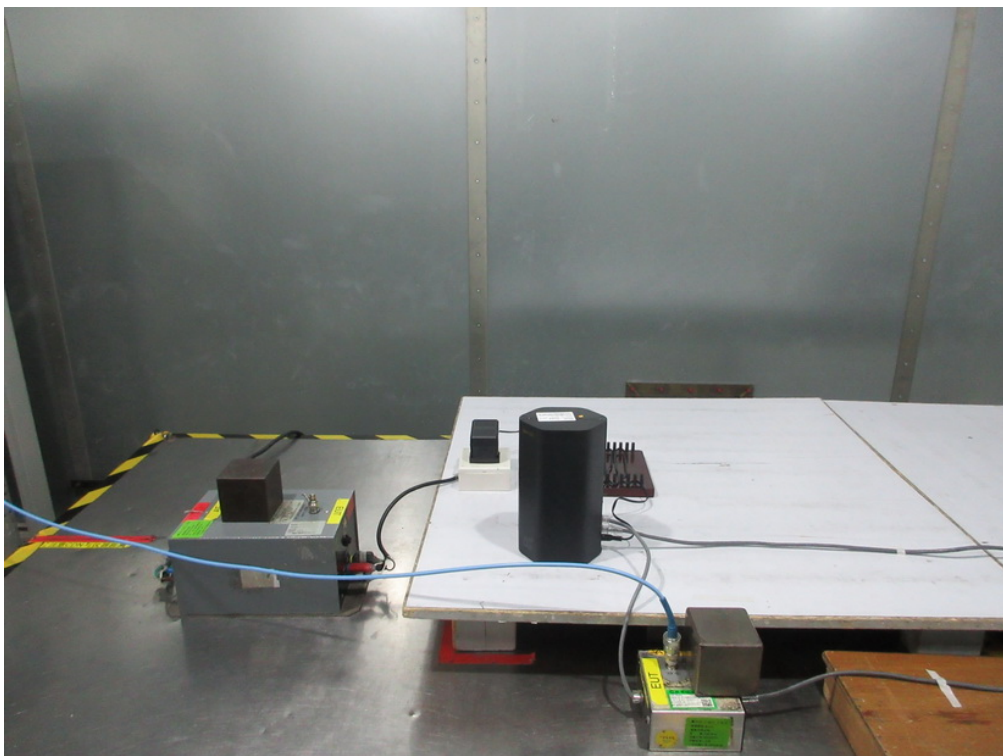
Surge immunity - AC



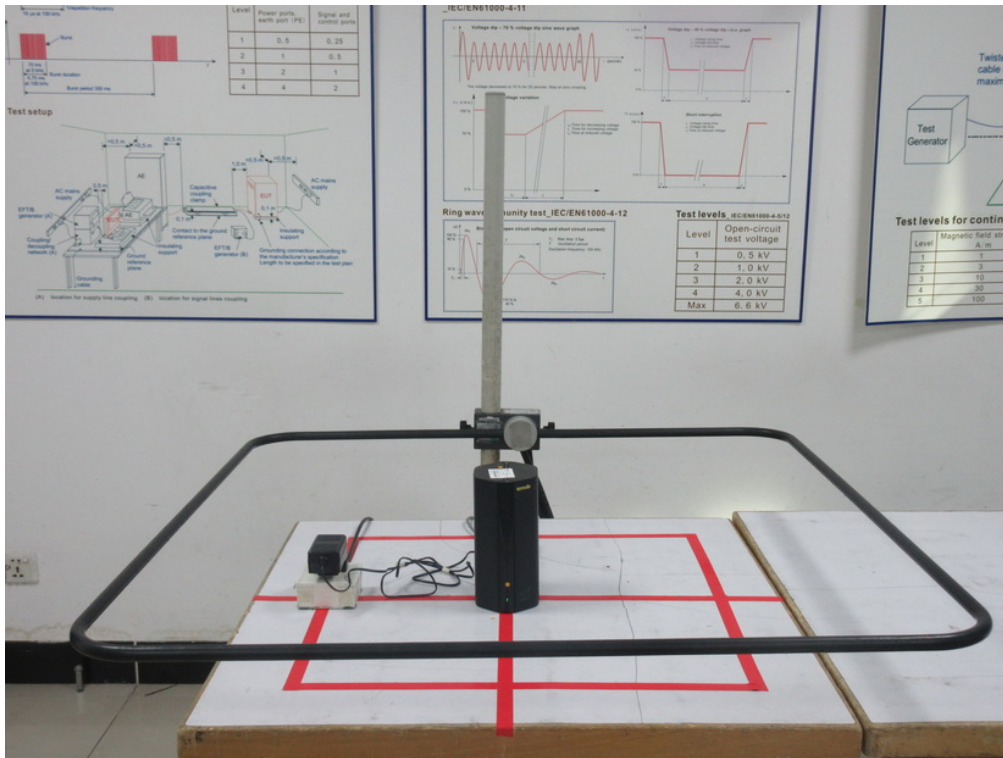
Immunity to conducted disturbances, induced by radio-frequency fields - AC



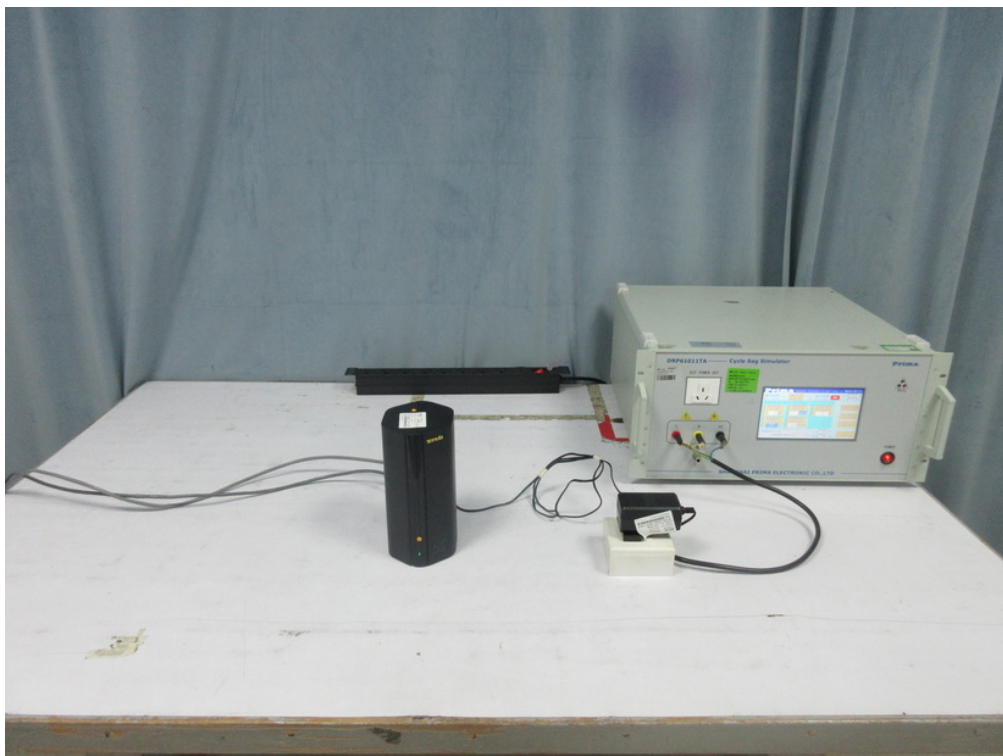
Immunity to conducted disturbances, induced by radio-frequency fields(RJ45)



Power frequency magnetic field immunity



Voltage dips, short interruptions and voltage variations immunity



End of Test Report