

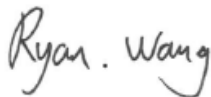
CE EMC Test Report

Project No. : 2104H026
Equipment : RS485 to Ethernet
Brand Name : High-Flying
Test Model : Protoss-PE11
Series Model : N/A
Applicant : Shanghai High-Flying Electronics Technology Co., Ltd.
Address : #17 Building, No.1500 Zu Chongzhi Road, Pudong District, 201203, Shanghai, China
Manufacturer : Shanghai High-Flying Electronics Technology Co., Ltd.
Address : #17 Building, No.1500 Zu Chongzhi Road, Pudong District, 201203, Shanghai, China
Factory : China Dragon Technology Limited
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Date of Receipt : Apr. 14, 2021
Date of Test : Apr. 25, 2021 ~ May 10, 2021
Issued Date : Sep. 13, 2021
Report Version : R00
Test Sample : Engineering Sample No.: SH2021040954
Standard(s) : EN 55032:2015+A11:2020
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019
EN 55035:2017+A11:2020

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



Prepared by : Antonio long



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TESTING CERT #5123.03

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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).

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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.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Sep. 13, 2021

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	Harmonic current	PASS
EN 61000-3-3:2013+A1:2019	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 61000-4-3:2006+A1:2007+A2:2010	RS	PASS
	IEC 61000-4-4:2012	EFT	PASS
	IEC 61000-4-5:2014 +A1:2017	Surge	PASS
	IEC 61000-4-6:2013	CS	PASS
	IEC 61000-4-8:2009	PFMF	PASS
	IEC 61000-4-11:2004+A1:2017	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 is located at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, 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)
SH-CB01 (3m)	CISPR	30 MHz ~ 200 MHz	V	3.76
		30 MHz ~ 200 MHz	H	3.00
		200 MHz ~ 1,000 MHz	V	3.86
		200 MHz ~ 1,000 MHz	H	3.86

B. Radiated emissions above 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
SH-CB01 (3m)	CISPR	1 GHz ~ 6 GHz	4.98

C. Conducted emissions AC mains power port measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
SH-C01	CISPR	150 kHz ~ 30MHz	2.64

D. Conducted disturbance at telecommunication port measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
SH-C01	CISPR	AAN Cat.3 LCL = 55...40 dB	3.42
		AAN Cat.5 LCL = 65...50 dB	3.88
		AAN Cat.6 LCL = 75...60 dB	4.38
		Capacitive MVoltage Probe (CVP)	3.04
		Current Probe (CP)	1.98

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

Test Site	Method	Test Item	U(%)
SH-SR03	EN 61000-3-2	Voltage	0.600
	EN 61000-3-3	Current	0.593

F. Immunity Measurement:

Test Site	Method	Test Item	Expanded uncertaintyk=2
SH-SR01	IEC 61000-4-2	Rise time tr	7.0%
		Peak current Ip	6.0%
		Current at 30 ns	6.0%
		Current at 60 ns	6.7%
SH-CB12	IEC 61000-4-3	Electromagnetic field immunity test	1.84dB
		Electrical measurements	1.84dB
		Measuring the demodulation on analogue wired network lines	1.84dB
		PER or FER measurement, test set-up for RS (WLAN 2.4G&5G ,BT)	1.94dB
SH-SR02	IEC 61000-4-4	Peak voltage (VP)	3.9%
		Rise time (tr)	4.4%
		Pulse width(tw)	4.2%
		Pulse Freq.(kHz)	0.8%
		Burst Duration(ms)	1.4%
		Burst Period(ms)	1.4%
		Peak voltage (VP)-with clamp	3.7%
		Rise time (tr) -with clamp	4.8%
		Pulse width(tw) -with clamp	4.2%
SH-SR02	IEC 61000-4-5	Open-Circuit Output Voltage	4.0%
		Open circuit front time	6.1%
		Open circuit time of half value	4.7%
SH-SR03	IEC 61000-4-6	CDN	1.56dB
		EM clamp	3.44dB
		Electrical measurements	1.56dB
		Measuring the demodulation on analogue wired network lines	1.56dB
		PER or FER measurement, test set-up for CS (WLAN 2.4G&5G ,BT)	1.68dB
SH-TR02	IEC 61000-4-8	Magnetic Field Strength	2.97%
SH-SR02	IEC 61000-4-11	DIP Amplitude	3.7%
		DIP Time Event	5.9%

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	24°C	57%	Devo Wang
Radiated emissions above 1 GHz	24°C	57%	Wilbur Wang
Conducted emissions AC mains power port	26°C	42%	Joven Xiong
Asymmetric mode conducted emissions	26°C	42%	Joven Xiong
Harmonic current	25°C	46%	Andrews Tu
Voltage fluctuations (Flicker)	25°C	46%	Andrews Tu

Test Item	Temperature	Humidity	Pressure	Tested By
ESD	24°C	45%	1011hPa	Benjamin Deng
RS	24°C	53%	/	Max Liu
EFT	26°C	48%	/	Sam Cheng
Surge	26°C	48%	/	Sam Cheng
CS	25°C	46%	/	Andrews Tu
PFMF	20°C	55%	/	Devo Wang
Dips	26°C	48%	/	Sam Cheng

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	RS485 to Ethernet
Brand Name	High-Flying
Test Model	Protoss-PE11
Series Model	N/A
Model Difference(s)	N/A
Power Source	External Power Supply.
Power Rating	Protoss-PE11-H: 100~240VAC@50~60Hz
Connecting I/O Port(s)	1* AC Port 1* RS485 Port 1* Ethernet Port
Classification Of EUT	Class B
Highest Internal Frequency(Fx)	96 MHz

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
Mode 2	Ethernet Port 100Mbps(Unshielded line)
Mode 3	Ethernet Port 10Mbps(Unshielded line)
Mode 4	Ethernet Port 100Mbps(Shielded line)

Radiated emissions up to 1 GHz test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

Radiated emissions Above 1 GHz test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

Conducted emissions AC mains power port test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

Asymmetric mode conducted emissions test	
Final Test Mode	Description
Mode 2	Ethernet Port 100Mbps(Unshielded line)
Mode 3	Ethernet Port 10Mbps(Unshielded line)
Mode 4	Ethernet Port 100Mbps(Shielded line)

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

Immunity Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

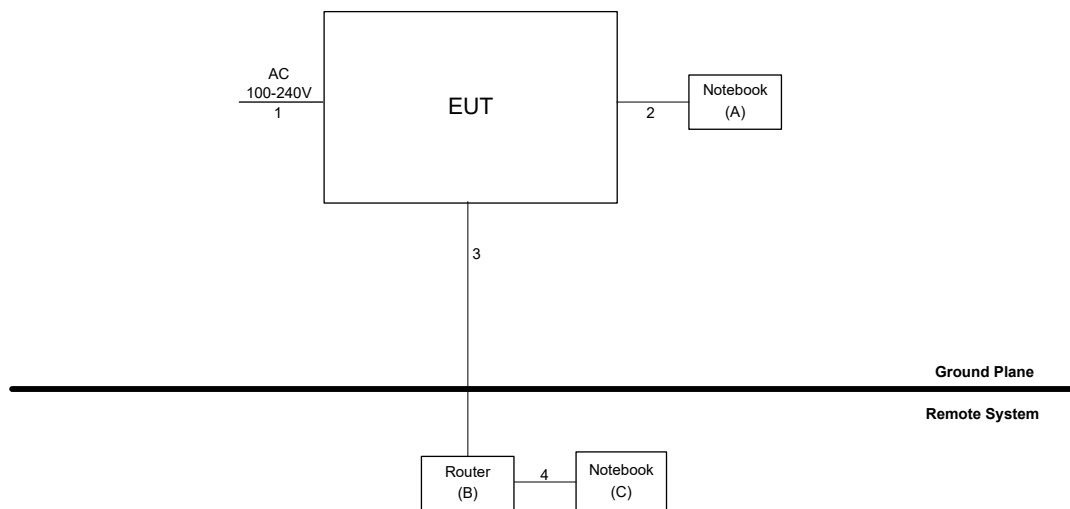
2.3 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

The standard test signals and output signal as following:

1. EUT connect to the Notebook via RS232 to RS485 Cable.
2. EUT connect to the Router via RJ45 Cable.
3. Router connect to the Notebook via RJ45 Cable.

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	ThinkPad	E470C	20H3A00VCDPF0S8287
B	Router	D-Link	DLR-823G	N/A
C	Notebook	ThinkPad	E470C	20H3A00VCDPF0S9M9X

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	AC Cable	NO	NO	1.8m
2	RS232 to RS485 Cable	NO	NO	4m
3	RJ45 Cable	NO	NO	18m
4	RJ45 Cable	NO	NO	1m

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	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 26, 2022
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 20, 2022
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-S M-7000	170330	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-S M-1000	170331	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-N M-3500	170621	Apr. 11, 2022
7	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.

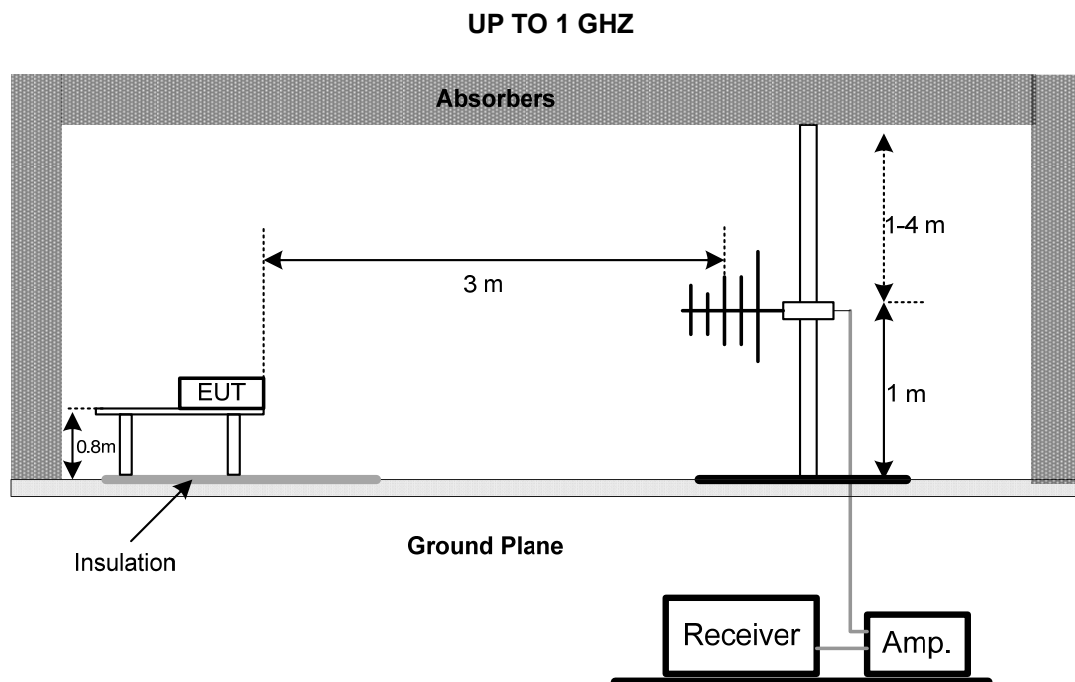
3.1.3 TEST PROCEDURE

- 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 Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- For the actual test configuration, please refer to the related Item - Block Diagram of system tested.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 MEASUREMENT DISTANCE

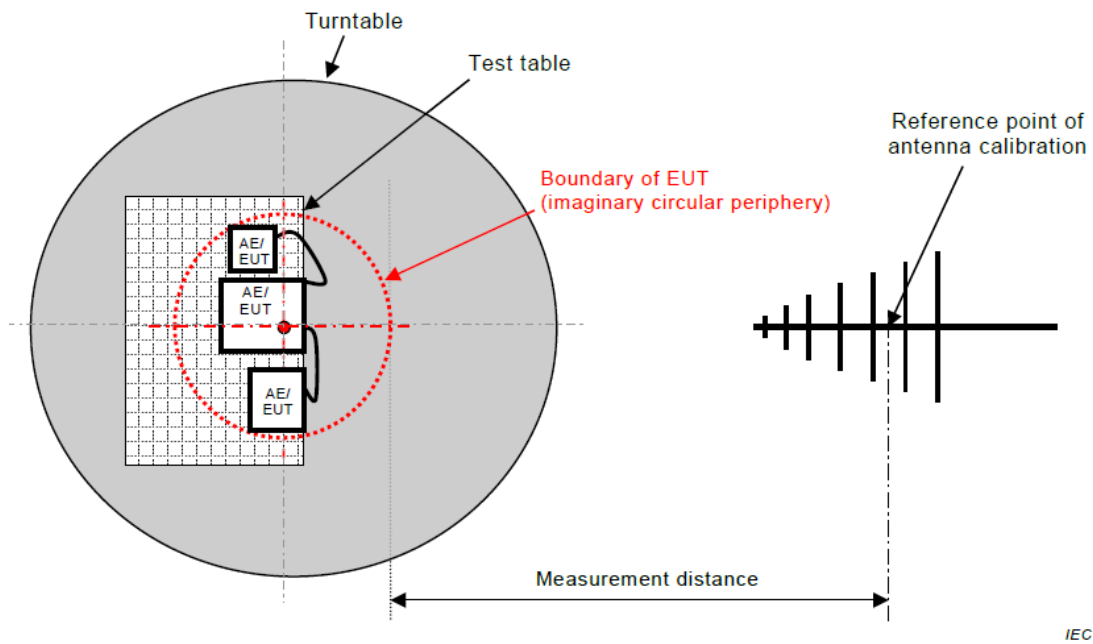


Figure C.1 – Measurement distance

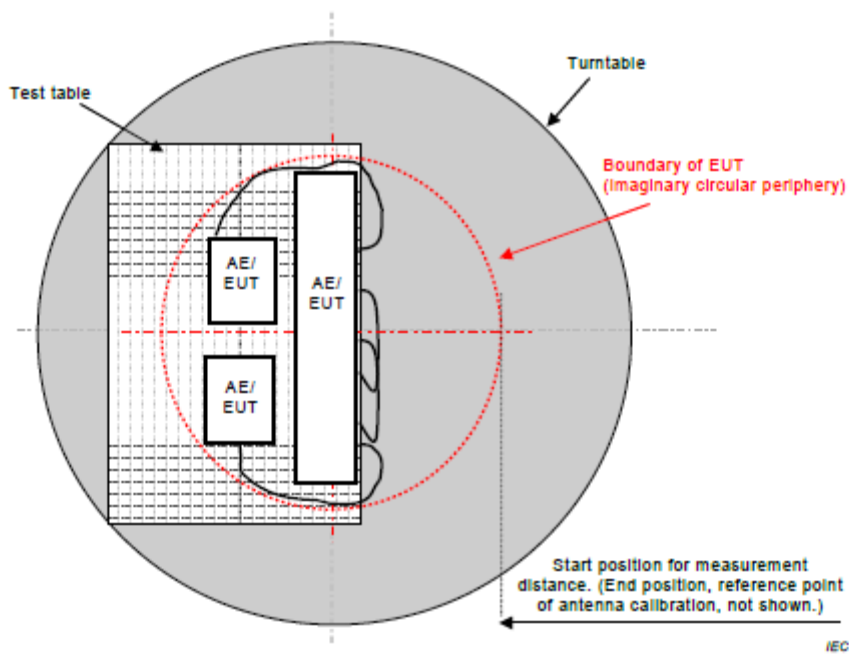
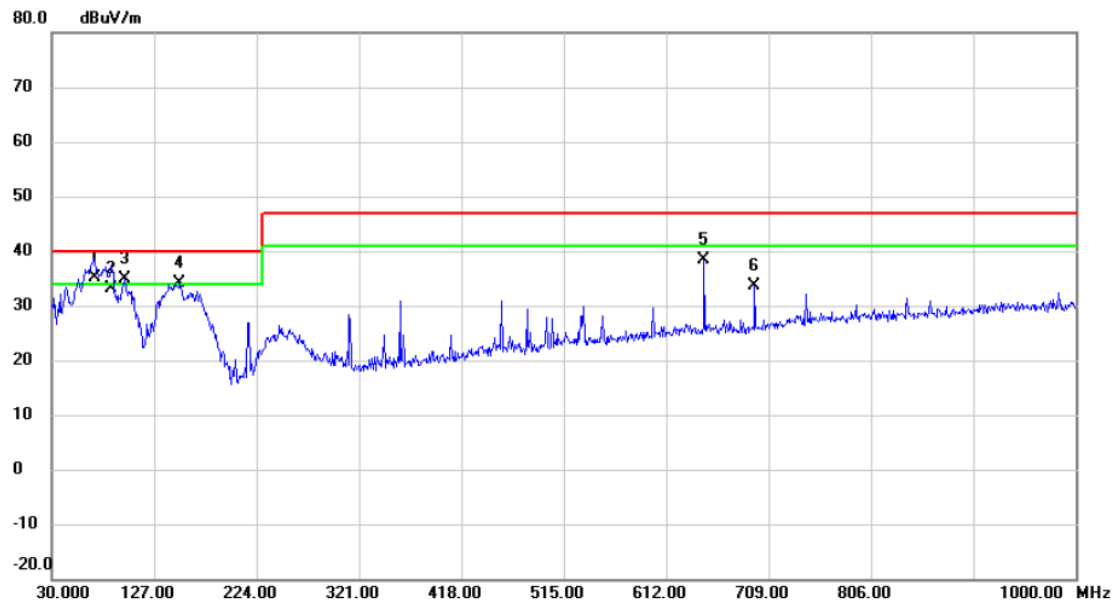


Figure C.2 – Boundary of EUT, Local AE and associated cabling

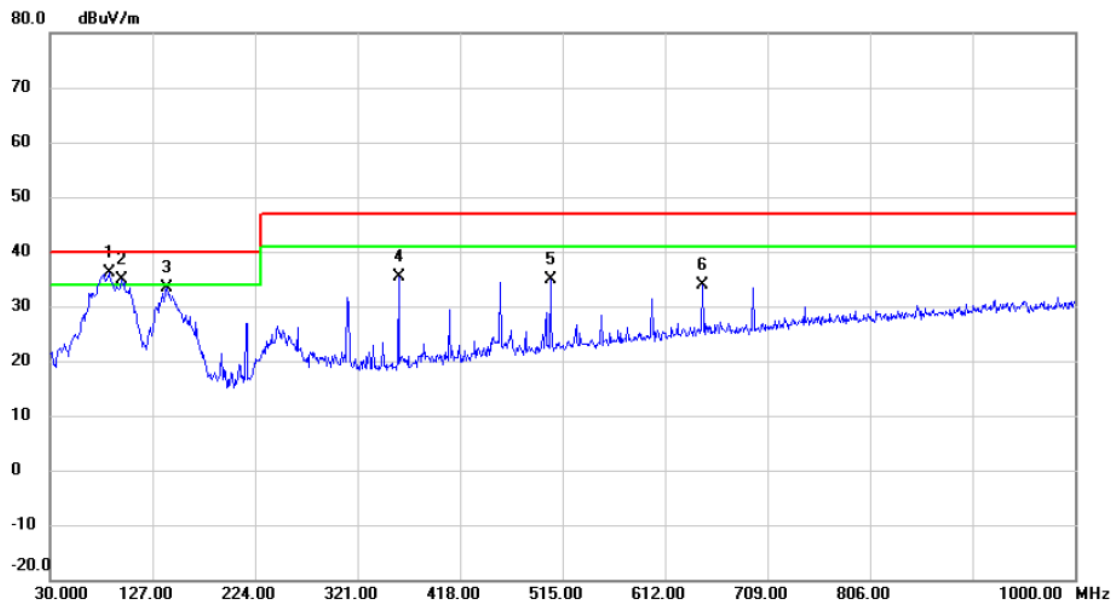
3.1.7 TEST RESULTS

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	FULL SYSTEM		



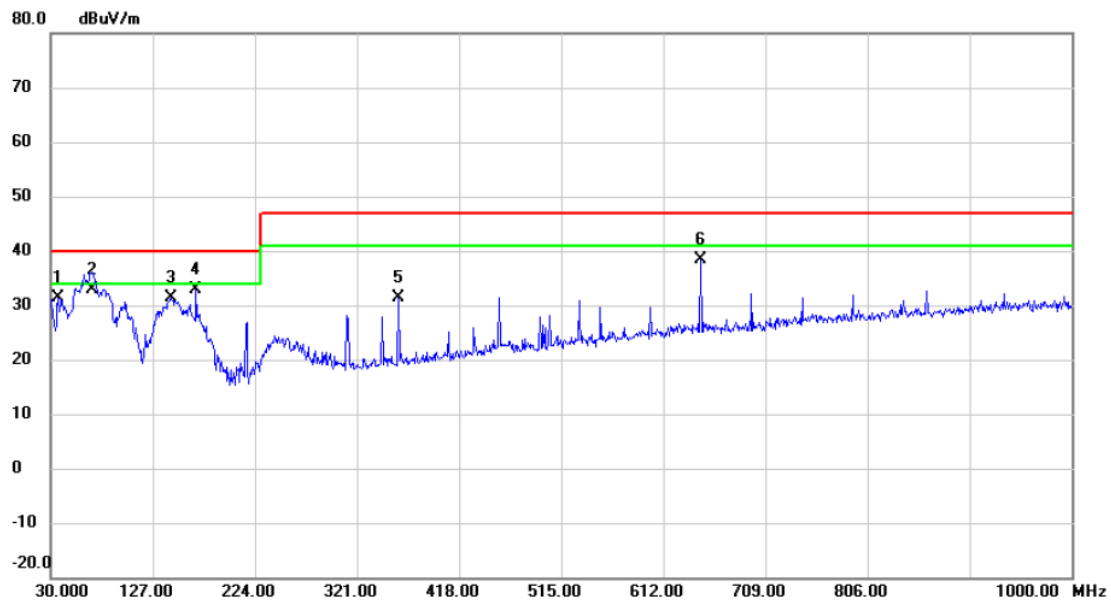
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	70.2550	53.27	-18.02	35.25	40.00	-4.75	QP	
2		86.7450	54.02	-21.00	33.02	40.00	-6.98	QP	
3	!	98.8700	55.19	-20.34	34.85	40.00	-5.15	QP	
4	!	151.2500	49.71	-15.48	34.23	40.00	-5.77	QP	
5		647.8900	45.37	-6.95	38.42	47.00	-8.58	QP	
6		695.9050	40.07	-6.54	33.53	47.00	-13.47	QP	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	FULL SYSTEM		



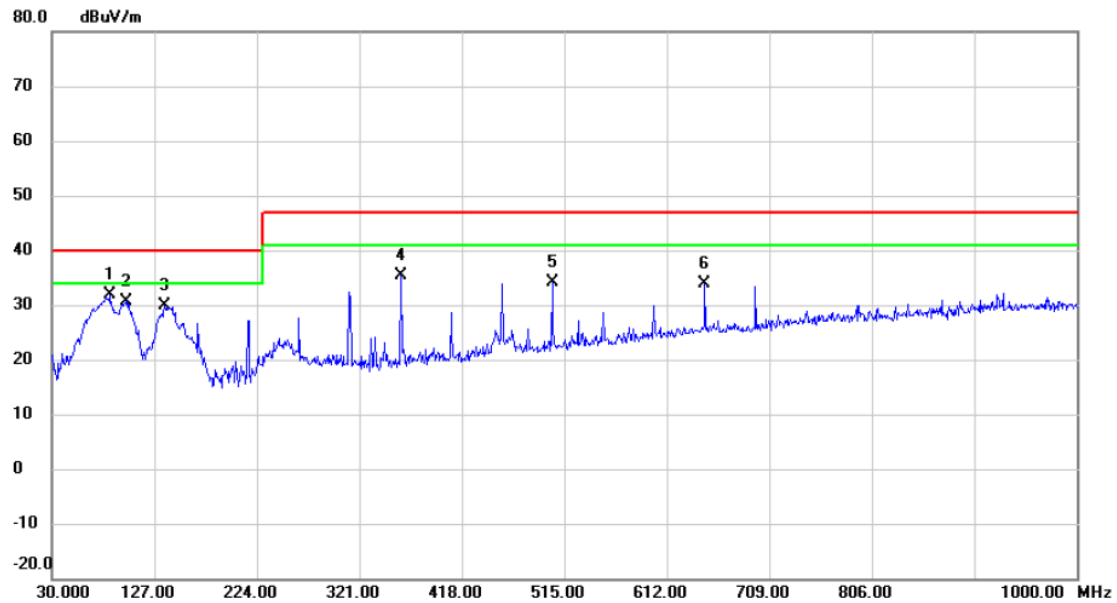
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	85.7750	57.04	-20.96	36.08	40.00	-3.92	QP	
2	!	97.4150	55.40	-20.51	34.89	40.00	-5.11	QP	
3		141.0650	49.41	-16.08	33.33	40.00	-6.67	QP	
4		359.8000	48.46	-13.18	35.28	47.00	-11.72	QP	
5		503.8450	44.79	-10.00	34.79	47.00	-12.21	QP	
6		647.8900	40.91	-6.95	33.96	47.00	-13.04	QP	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	FULL SYSTEM		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		37.2750	48.49	-17.12	31.37	40.00	-8.63	QP	
2	*	69.2850	50.62	-17.84	32.78	40.00	-7.22	QP	
3		144.4600	47.35	-15.86	31.49	40.00	-8.51	QP	
4		168.2250	48.31	-15.53	32.78	40.00	-7.22	QP	
5		359.8000	44.55	-13.18	31.37	47.00	-15.63	QP	
6		647.8900	45.31	-6.95	38.36	47.00	-8.64	QP	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	FULL SYSTEM		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	85.2900	52.86	-20.94	31.92	40.00	-8.08	QP	
2		99.8400	50.94	-20.21	30.73	40.00	-9.27	QP	
3		136.7000	46.28	-16.45	29.83	40.00	-10.17	QP	
4		359.8000	48.49	-13.18	35.31	47.00	-11.69	QP	
5		503.8450	44.05	-10.00	34.05	47.00	-12.95	QP	
6		647.8900	40.87	-6.95	33.92	47.00	-13.08	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

3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	206960	Mar. 28, 2022
2	Pre-Amplifier	emci	EMC012645SE	980421	May 11, 2021
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480545	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-S M-7000	170330	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-S M-1000	170331	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-N M-3500	170621	Apr. 11, 2022
7	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.

3.2.3 TEST PROCEDURE

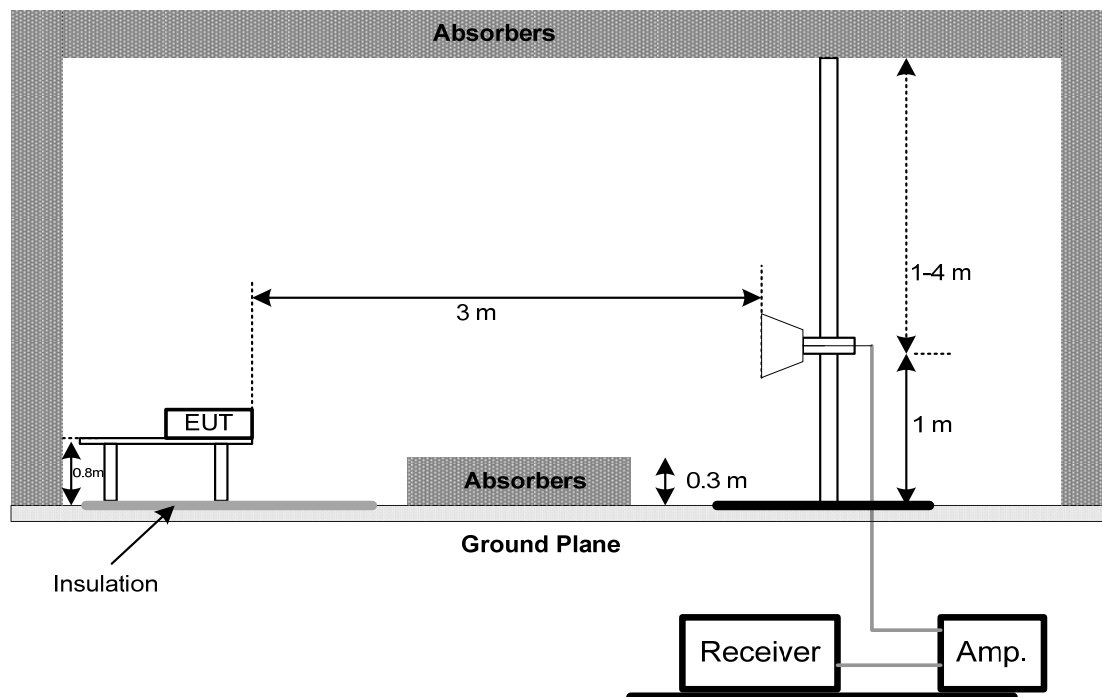
- The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the 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 Quasi Peak 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 - Block Diagram of system tested.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP

ABOVE 1 GHZ



3.2.6 MEASUREMENT DISTANCE

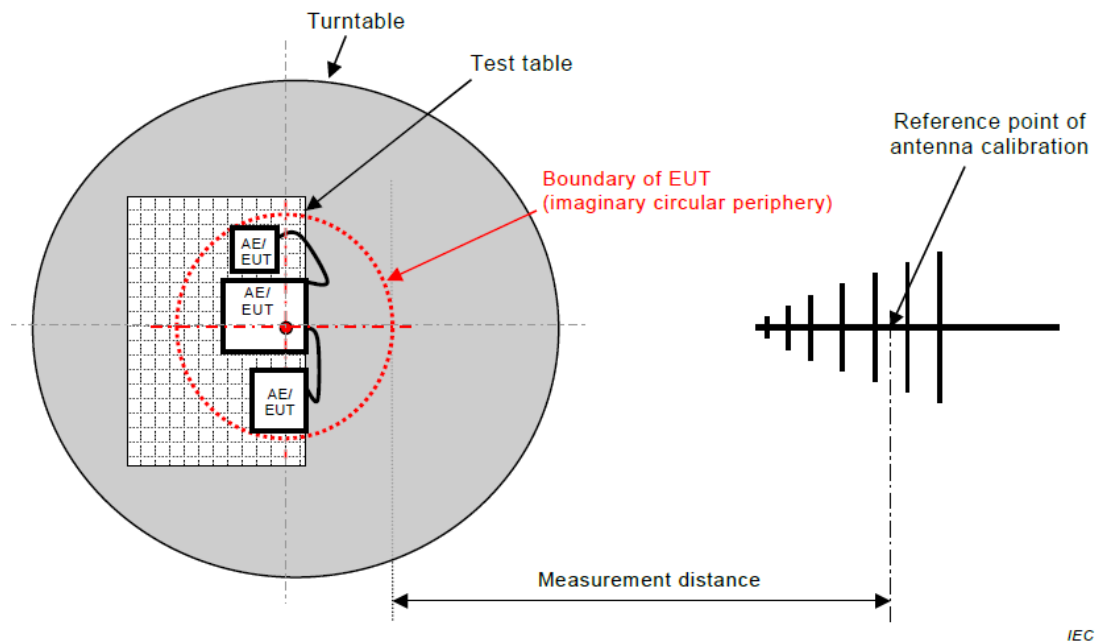


Figure C.1 – Measurement distance

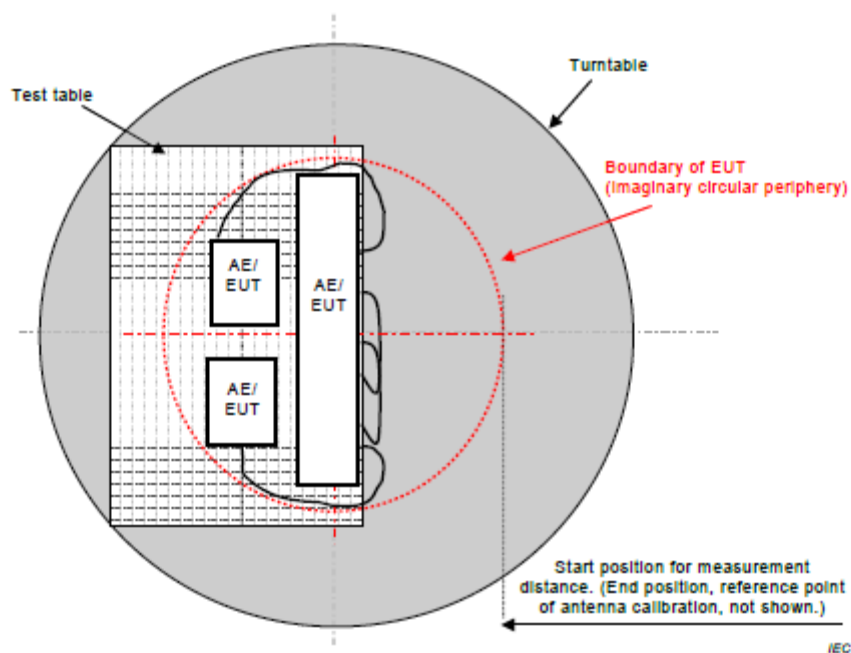
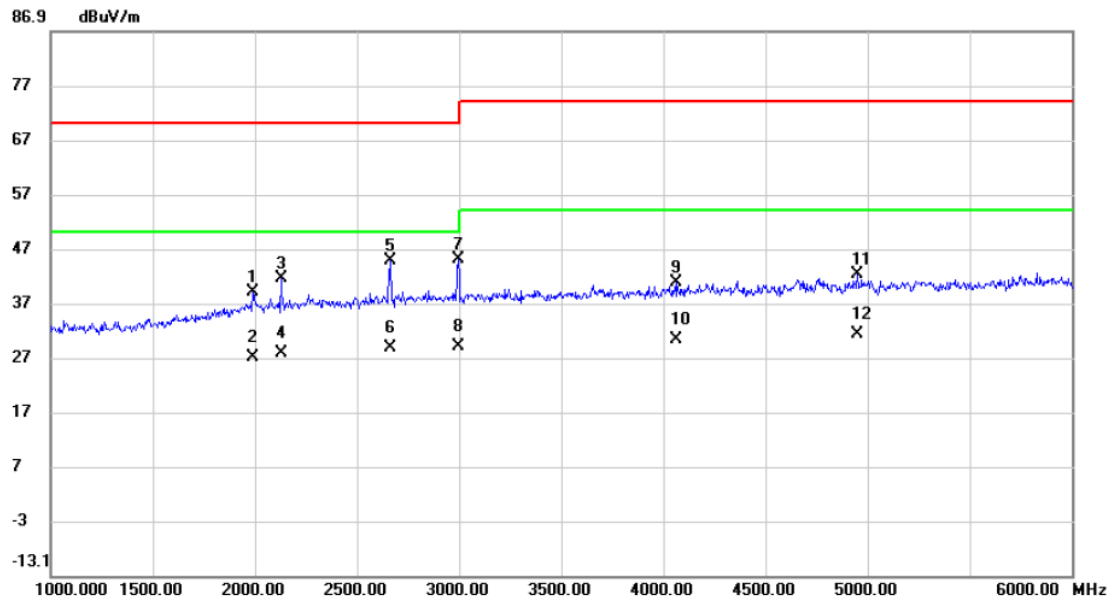


Figure C.2 – Boundary of EUT, Local AE and associated cabling

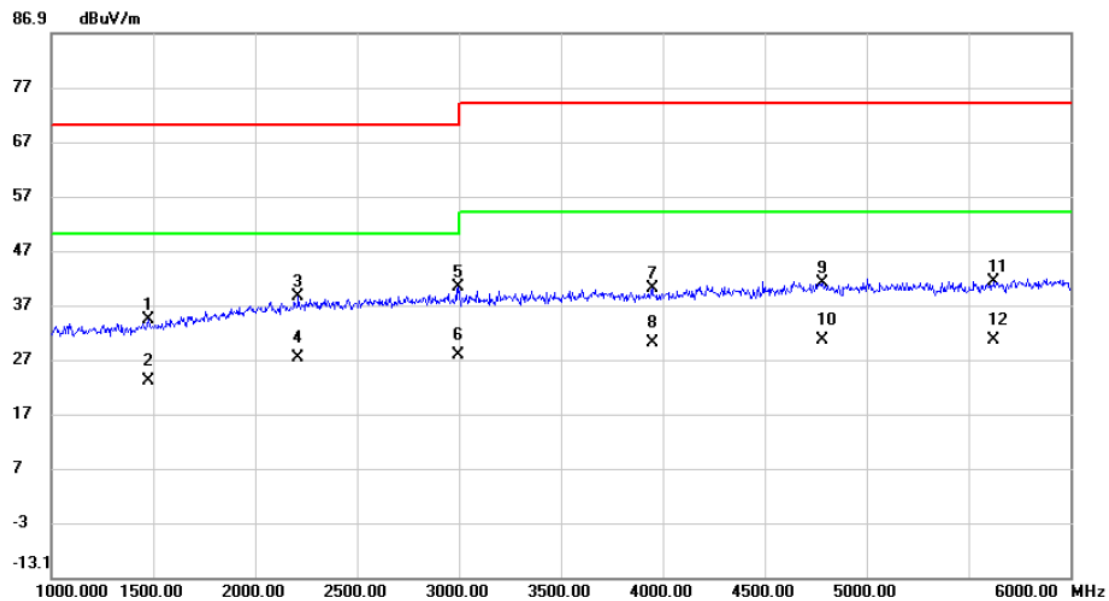
3.2.7 TEST RESULTS

Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	FULL SYSTEM		



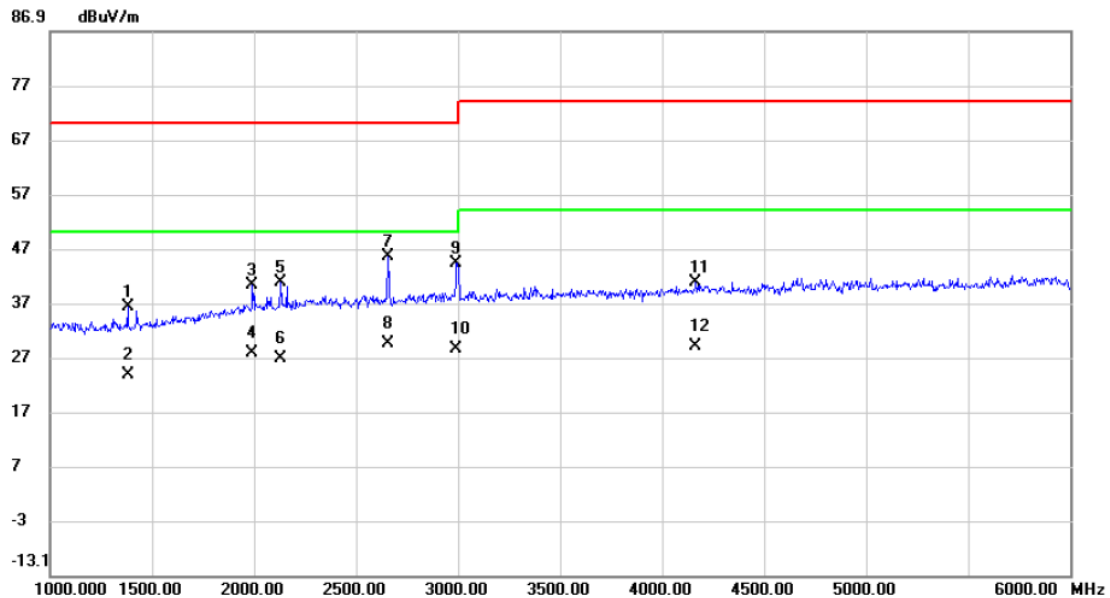
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1992.500	56.41	-17.45	38.96	70.00	-31.04	peak	
2		1992.500	44.59	-17.45	27.14	50.00	-22.86	AVG	
3		2127.500	58.42	-16.85	41.57	70.00	-28.43	peak	
4		2127.500	44.54	-16.85	27.69	50.00	-22.31	AVG	
5		2665.000	59.77	-14.95	44.82	70.00	-25.18	peak	
6		2665.000	43.69	-14.95	28.74	50.00	-21.26	AVG	
7		2997.500	59.34	-14.25	45.09	70.00	-24.91	peak	
8	*	2997.500	43.28	-14.25	29.03	50.00	-20.97	AVG	
9		4065.000	52.72	-12.05	40.67	74.00	-33.33	peak	
10		4065.000	42.21	-12.05	30.16	54.00	-23.84	AVG	
11		4950.000	52.25	-10.03	42.22	74.00	-31.78	peak	
12		4950.000	41.38	-10.03	31.35	54.00	-22.65	AVG	

Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	FULL SYSTEM		



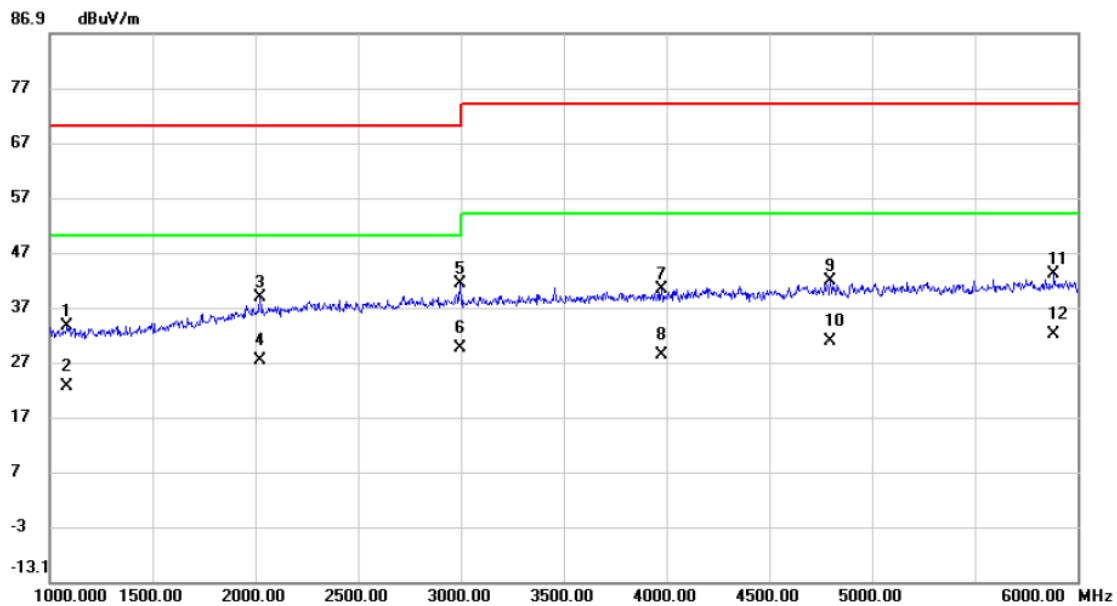
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1477.500	55.92	-21.54	34.38	70.00	-35.62	peak	
2		1477.500	44.57	-21.54	23.03	50.00	-26.97	AVG	
3		2210.000	55.02	-16.51	38.51	70.00	-31.49	peak	
4		2210.000	43.86	-16.51	27.35	50.00	-22.65	AVG	
5		2997.500	54.62	-14.25	40.37	70.00	-29.63	peak	
6	*	2997.500	42.15	-14.25	27.90	50.00	-22.10	AVG	
7		3947.500	52.41	-12.34	40.07	74.00	-33.93	peak	
8		3947.500	42.27	-12.34	29.93	54.00	-24.07	AVG	
9		4780.000	51.52	-10.37	41.15	74.00	-32.85	peak	
10		4780.000	40.80	-10.37	30.43	54.00	-23.57	AVG	
11		5625.000	50.49	-9.11	41.38	74.00	-32.62	peak	
12		5625.000	39.72	-9.11	30.61	54.00	-23.39	AVG	

Test Voltage	AC 110V/60Hz	Polarization	Vertical
Test Mode	FULL SYSTEM		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		1380.000	58.11	-21.84	36.27	70.00	-33.73	peak	
2		1380.000	45.51	-21.84	23.67	50.00	-26.33	AVG	
3		1990.000	57.68	-17.48	40.20	70.00	-29.80	peak	
4		1990.000	45.27	-17.48	27.79	50.00	-22.21	AVG	
5		2132.500	57.68	-16.83	40.85	70.00	-29.15	peak	
6		2132.500	43.62	-16.83	26.79	50.00	-23.21	AVG	
7		2655.000	60.55	-14.97	45.58	70.00	-24.42	peak	
8	*	2655.000	44.54	-14.97	29.57	50.00	-20.43	AVG	
9		2992.500	58.58	-14.27	44.31	70.00	-25.69	peak	
10		2992.500	42.71	-14.27	28.44	50.00	-21.56	AVG	
11		4165.000	52.56	-11.80	40.76	74.00	-33.24	peak	
12		4165.000	40.91	-11.80	29.11	54.00	-24.89	AVG	

Test Voltage	AC 110V/60Hz	Polarization	Horizontal
Test Mode	FULL SYSTEM		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1085.000	56.30	-22.72	33.58	70.00	-36.42	peak	
2		1085.000	45.20	-22.72	22.48	50.00	-27.52	AVG	
3		2020.000	56.13	-17.31	38.82	70.00	-31.18	peak	
4		2020.000	44.68	-17.31	27.37	50.00	-22.63	AVG	
5		2997.500	55.47	-14.25	41.22	70.00	-28.78	peak	
6	*	2997.500	43.79	-14.25	29.54	50.00	-20.46	AVG	
7		3975.000	52.63	-12.27	40.36	74.00	-33.64	peak	
8		3975.000	40.56	-12.27	28.29	54.00	-25.71	AVG	
9		4797.500	52.18	-10.33	41.85	74.00	-32.15	peak	
10		4797.500	41.03	-10.33	30.70	54.00	-23.30	AVG	
11		5885.000	51.22	-8.23	42.99	74.00	-31.01	peak	
12		5885.000	40.32	-8.23	32.09	54.00	-21.91	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	Line Impedance Stabilisation Network	Schwarzbeck	NNLK 8121	8121-822	Mar. 20, 2022
2	TWO-LINE V-NETWORK	R&S	ENV216	101340	Aug. 23, 2021
3	Test Cable	emci	EMCRG400-BM-N M-10000	N/A	Apr. 11, 2022
4	EMI Test Receiver	R&S	ESCI	100082	Mar. 21, 2022
5	50Ω Terminator	SHX	TF2-1G-A	17051602	Mar. 20, 2022
6	50Ω coaxial switch	Anritsu	MP59B	6201750902	Mar. 21, 2022
7	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.

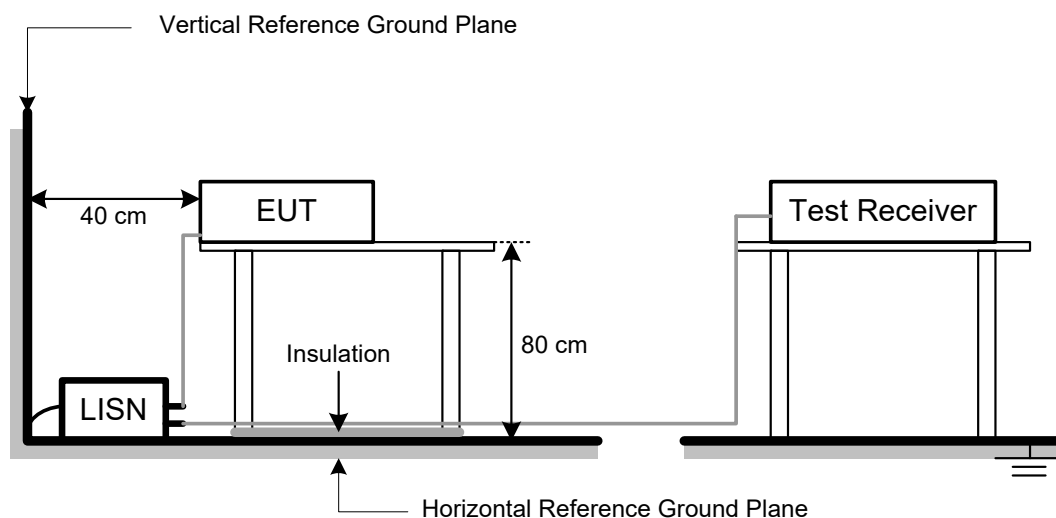
3.3.3 TEST PROCEDURE

- 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

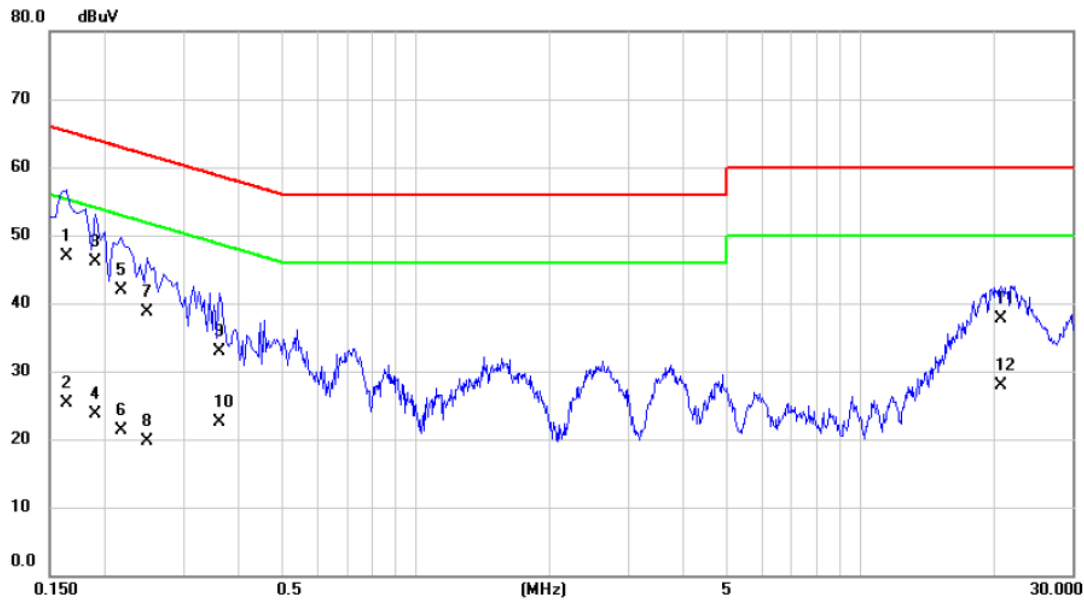
No deviation

3.3.5 TEST SETUP



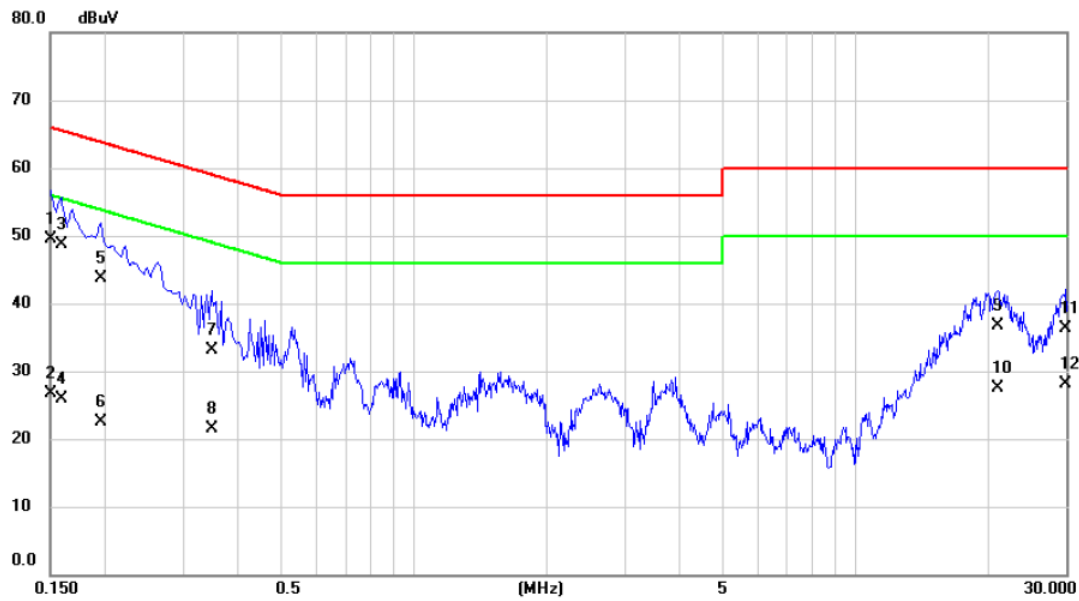
3.3.6 TEST RESULTS

Test Voltage	AC 230V/50Hz	Phase	Line
Test Mode	FULL SYSTEM		



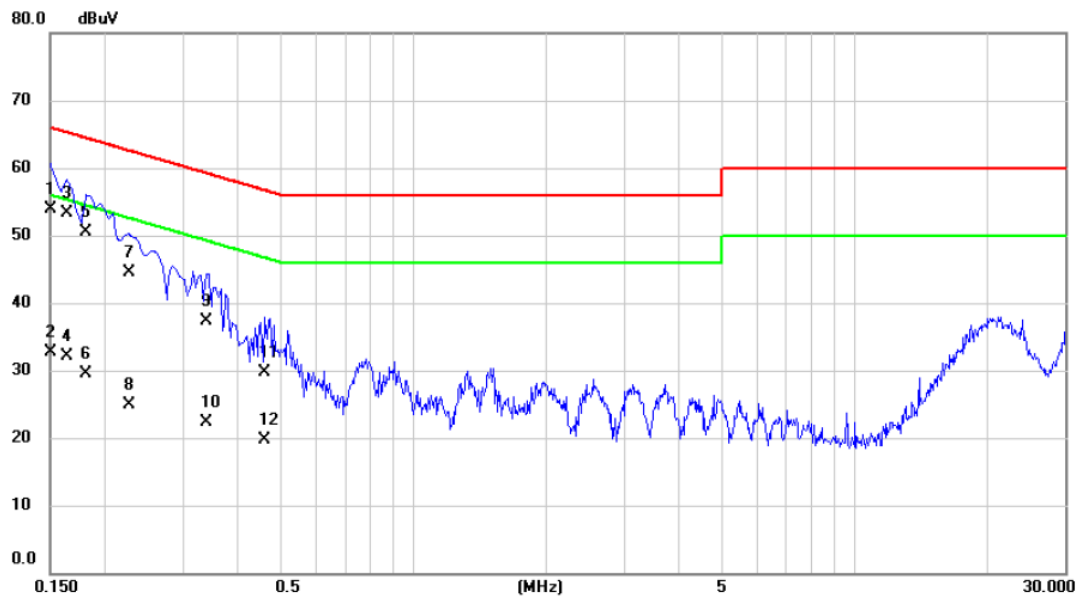
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1635	37.20	9.73	46.93	65.28	-18.35	QP	
2		0.1635	15.50	9.73	25.23	55.28	-30.05	AVG	
3	*	0.1905	36.30	9.74	46.04	64.01	-17.97	QP	
4		0.1905	14.00	9.74	23.74	54.01	-30.27	AVG	
5		0.2175	32.10	9.74	41.84	62.91	-21.07	QP	
6		0.2175	11.60	9.74	21.34	52.91	-31.57	AVG	
7		0.2490	29.00	9.74	38.74	61.79	-23.05	QP	
8		0.2490	10.00	9.74	19.74	51.79	-32.05	AVG	
9		0.3615	23.20	9.78	32.98	58.69	-25.71	QP	
10		0.3615	12.70	9.78	22.48	48.69	-26.21	AVG	
11		20.7420	27.10	10.53	37.63	60.00	-22.37	QP	
12		20.7420	17.40	10.53	27.93	50.00	-22.07	AVG	

Test Voltage	AC 230V/50Hz	Phase	Neutral
Test Mode	FULL SYSTEM		



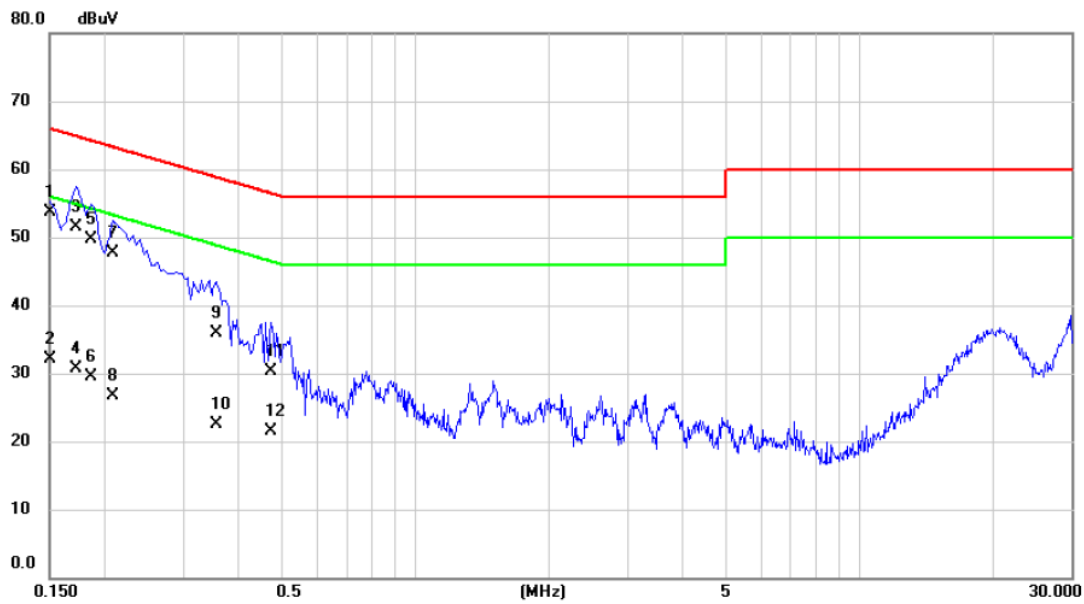
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1500	39.90	9.68	49.58	66.00	-16.42	QP	
2		0.1500	17.10	9.68	26.78	56.00	-29.22	AVG	
3		0.1590	39.00	9.69	48.69	65.52	-16.83	QP	
4		0.1590	16.20	9.69	25.89	55.52	-29.63	AVG	
5		0.1950	34.00	9.71	43.71	63.82	-20.11	QP	
6		0.1950	12.80	9.71	22.51	53.82	-31.31	AVG	
7		0.3480	23.40	9.74	33.14	59.01	-25.87	QP	
8		0.3480	11.70	9.74	21.44	49.01	-27.57	AVG	
9		20.9670	26.10	10.60	36.70	60.00	-23.30	QP	
10		20.9670	17.00	10.60	27.60	50.00	-22.40	AVG	
11		29.8500	25.60	10.72	36.32	60.00	-23.68	QP	
12		29.8500	17.40	10.72	28.12	50.00	-21.88	AVG	

Test Voltage	AC 110V/60Hz	Phase	Line
Test Mode	FULL SYSTEM		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	44.20	9.71	53.91	66.00	-12.09	QP	
2		0.1500	22.90	9.71	32.61	56.00	-23.39	AVG	
3	*	0.1635	43.60	9.73	53.33	65.28	-11.95	QP	
4		0.1635	22.40	9.73	32.13	55.28	-23.15	AVG	
5		0.1815	40.80	9.73	50.53	64.42	-13.89	QP	
6		0.1815	19.80	9.73	29.53	54.42	-24.89	AVG	
7		0.2265	34.70	9.74	44.44	62.58	-18.14	QP	
8		0.2265	15.20	9.74	24.94	52.58	-27.64	AVG	
9		0.3390	27.60	9.76	37.36	59.23	-21.87	QP	
10		0.3390	12.50	9.76	22.26	49.23	-26.97	AVG	
11		0.4605	19.90	9.79	29.69	56.68	-26.99	QP	
12		0.4605	10.00	9.79	19.79	46.68	-26.89	AVG	

Test Voltage	AC 110V/60Hz	Phase	Neutral
Test Mode	FULL SYSTEM		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1500	44.10	9.68	53.78	66.00	-12.22	QP	
2		0.1500	22.40	9.68	32.08	56.00	-23.92	AVG	
3		0.1725	41.80	9.70	51.50	64.84	-13.34	QP	
4		0.1725	21.00	9.70	30.70	54.84	-24.14	AVG	
5		0.1860	40.00	9.70	49.70	64.21	-14.51	QP	
6		0.1860	19.90	9.70	29.60	54.21	-24.61	AVG	
7		0.2085	38.00	9.71	47.71	63.26	-15.55	QP	
8		0.2085	17.00	9.71	26.71	53.26	-26.55	AVG	
9		0.3570	26.10	9.75	35.85	58.80	-22.95	QP	
10		0.3570	12.70	9.75	22.45	48.80	-26.35	AVG	
11		0.4740	20.50	9.77	30.27	56.44	-26.17	QP	
12		0.4740	11.70	9.77	21.47	46.44	-24.97	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	Line Impedance Stabilisation Network	Schwarzbeck	NNLK 8121	8121-822	Mar. 20, 2022
2	TWO-LINE V-NETWORK	R&S	ENV216	101340	Aug. 23, 2021
3	EMI Test Receiver	R&S	ESCI	100082	Mar. 21, 2022
4	Test Cable	emci	EMCRG400-BM-NM-10000	N/A	Apr. 11, 2022
5	50Ω Terminator	SHX	TF2-1G-A	17051602	Mar. 20, 2022
6	50Ω Terminator	SHX	TF2-1G-A	17051603	Mar. 20, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	ISN	Teseq	ISN T8-Cat6	43900	Nov. 24, 2021
9	ISN	Teseq	ISN ST08	45264	Nov. 27, 2021

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

- a. 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.
- 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 30 to 40 cm long.
- c. 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.
- d. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- e. **AAN** at least 80 cm from nearest part of EUT chassis.

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

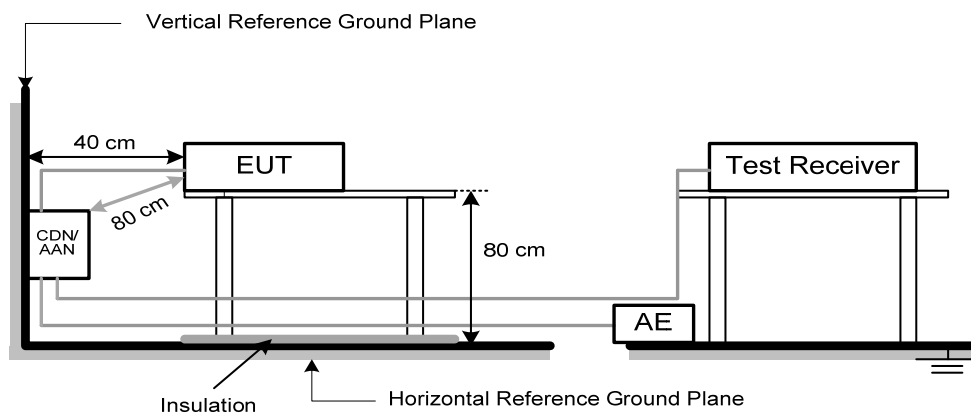
Compare the corrected voltage with the limit.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation

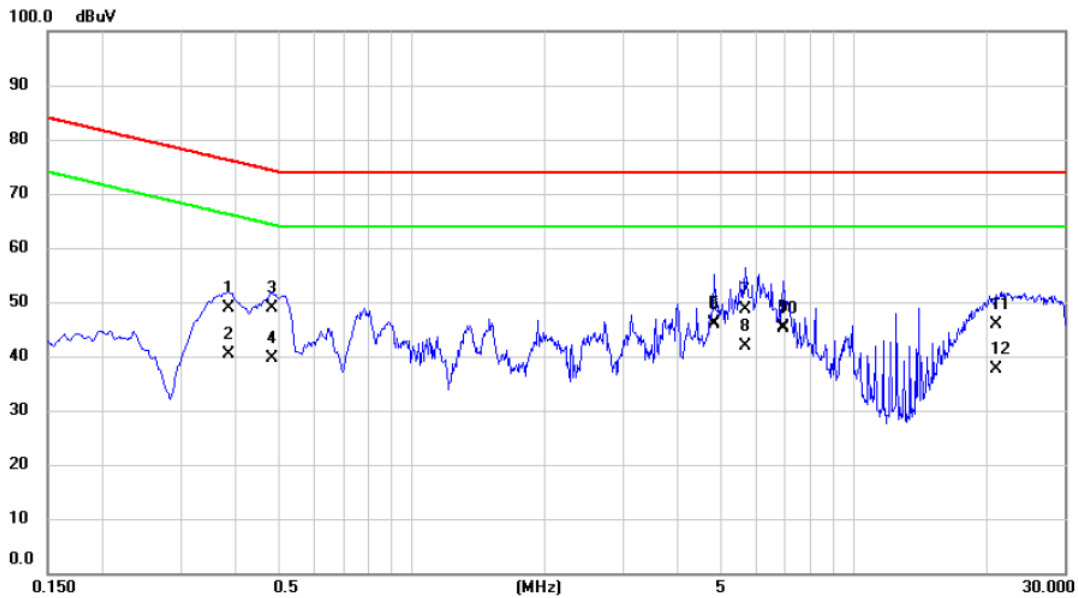
3.4.5 TEST SETUP

Cable Type: Balanced Unscreened, Screened or Coaxial



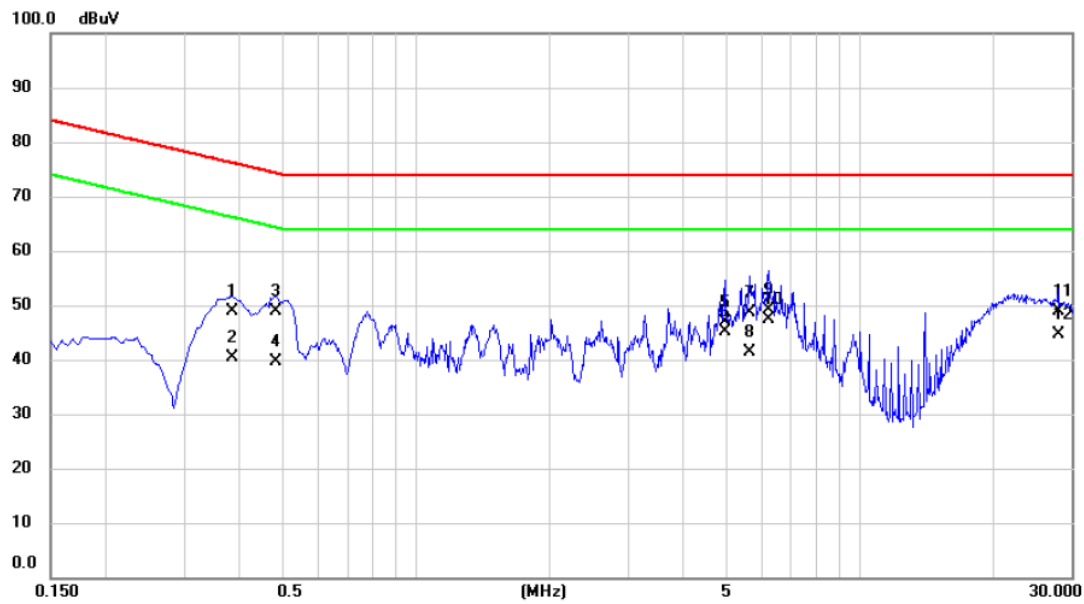
3.4.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	Ethernet Port 100Mbps(Unshielded line)



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.3840	39.00	9.86	48.86	76.19	-27.33	QP	
2	0.3840	30.50	9.86	40.36	66.19	-25.83	AVG	
3	0.4830	39.00	9.82	48.82	74.29	-25.47	QP	
4	0.4830	29.70	9.82	39.52	64.29	-24.77	AVG	
5	4.8390	36.50	9.75	46.25	74.00	-27.75	QP	
6 *	4.8390	36.20	9.75	45.95	64.00	-18.05	AVG	
7	5.6715	38.80	9.77	48.57	74.00	-25.43	QP	
8	5.6715	32.20	9.77	41.97	64.00	-22.03	AVG	
9	6.9180	35.50	9.79	45.29	74.00	-28.71	QP	
10	6.9180	35.30	9.79	45.09	64.00	-18.91	AVG	
11	20.9444	35.70	10.07	45.77	74.00	-28.23	QP	
12	20.9444	27.60	10.07	37.67	64.00	-26.33	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Ethernet Port 10Mbps(Unshielded line)



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.3840	38.90	9.86	48.76	76.19	-27.43	QP	
2	0.3840	30.60	9.86	40.46	66.19	-25.73	AVG	
3	0.4830	39.00	9.82	48.82	74.29	-25.47	QP	
4	0.4830	29.80	9.82	39.62	64.29	-24.67	AVG	
5	4.9560	37.10	9.74	46.84	74.00	-27.16	QP	
6	4.9560	35.40	9.74	45.14	64.00	-18.86	AVG	
7	5.6310	38.80	9.77	48.57	74.00	-25.43	QP	
8	5.6310	31.60	9.77	41.37	64.00	-22.63	AVG	
9	6.2250	39.30	9.78	49.08	74.00	-24.92	QP	
10 *	6.2250	37.70	9.78	47.48	64.00	-16.52	AVG	
11	28.0005	38.70	10.20	48.90	74.00	-25.10	QP	
12	28.0005	34.40	10.20	44.60	64.00	-19.40	AVG	

Test Voltage	AC 230V/50Hz
Test Mode	Ethernet Port 100Mbps(Shielded line)



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.3750	42.00	9.71	51.71	76.39	-24.68	QP	
2	0.3750	33.20	9.71	42.91	66.39	-23.48	AVG	
3	0.4740	42.20	9.71	51.91	74.44	-22.53	QP	
4	0.4740	33.80	9.71	43.51	64.44	-20.93	AVG	
5	0.7214	40.00	9.72	49.72	74.00	-24.28	QP	
6	0.7214	31.60	9.72	41.32	64.00	-22.68	AVG	
7	2.6250	35.00	9.80	44.80	74.00	-29.20	QP	
8	2.6250	27.00	9.80	36.80	64.00	-27.20	AVG	
9	14.0010	43.60	10.70	54.30	74.00	-19.70	QP	
10 *	14.0010	43.30	10.70	54.00	64.00	-10.00	AVG	
11	25.9620	43.70	10.62	54.32	74.00	-19.68	QP	
12	25.9620	34.30	10.62	44.92	64.00	-19.08	AVG	

3.5 HARMONIC CURRENT EMISSIONS TEST

3.5.1 LIMITS

EN 61000-3-2		
Equipment Category	Harmonic Order	Max. Permissible Harmonic Current
	n	A
Class A	Odd Harmonics	
	3	2.30
	5	1.14
	7	0.77
	9	0.40
	11	0.33
	13	0.21
	15≤n≤39	0.15 x 15/n
	Even Harmonics	
	2	1.08
	4	0.43
	6	0.30
	8≤n≤40	0.23 x 8/n

3.5.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	3 kVA single Phase Harmonics & Flicker Measuring System	Teseq	ProfLine 2103	1705A04171	Aug. 23, 2021
2	Measurement Software	California	CTS4 Version 4.23.0	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.

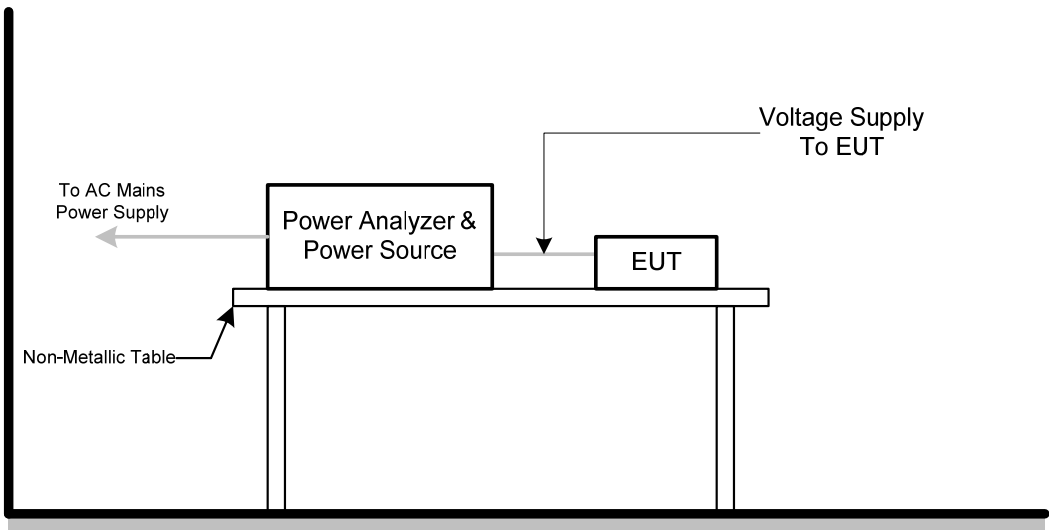
3.5.3 TEST PROCEDURE

- 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 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

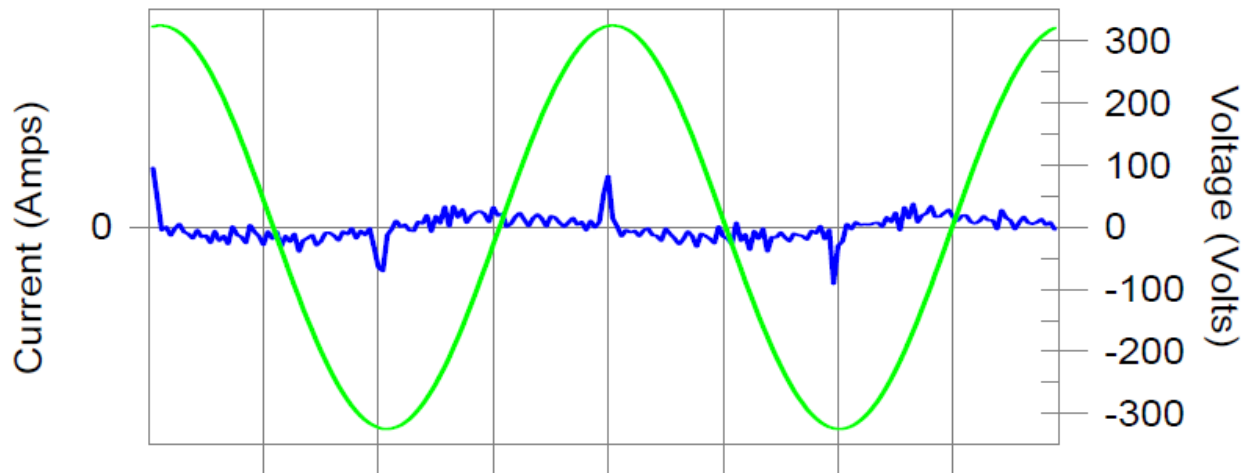
3.5.5 TEST SETUP



3.5.6 TEST RESULTS

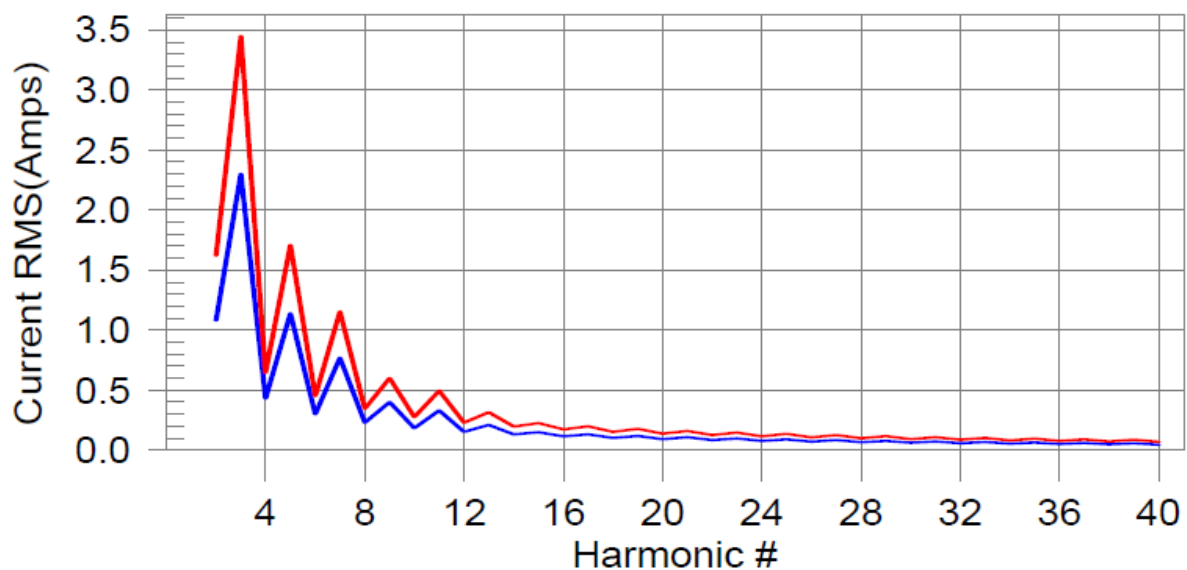
Harmonics – Class-A	
Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit

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

Highest parameter values during test:

V _{RMS} (Volts):	229.70	Frequency(Hz):	50.00
I _{Peak} (Amps):	0.069	I _{RMS} (Amps):	0.012
I _{Fund} (Amps):	0.008	Crest Factor:	6.012
Power (Watts):	0.5	Power Factor:	0.191

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

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

Highest parameter values during test:

Voltage (Vrms):	229.70	Frequency(Hz):	50.00
I_Peak (Amps):	0.069	I_RMS (Amps):	0.012
I_Fund (Amps):	0.008	Crest Factor:	6.012
Power (Watts):	0.5	Power Factor:	0.191

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.061	0.459	13.32	OK
3	0.408	2.067	19.72	OK
4	0.044	0.459	9.49	OK
5	0.014	0.919	1.55	OK
6	0.022	0.459	4.76	OK
7	0.034	0.689	4.97	OK
8	0.013	0.459	2.93	OK
9	0.014	0.459	3.00	OK
10	0.016	0.459	3.51	OK
11	0.013	0.230	5.64	OK
12	0.011	0.230	4.72	OK
13	0.009	0.230	3.92	OK
14	0.005	0.230	2.20	OK
15	0.011	0.230	4.75	OK
16	0.008	0.230	3.34	OK
17	0.010	0.230	4.29	OK
18	0.006	0.230	2.80	OK
19	0.013	0.230	5.55	OK
20	0.010	0.230	4.28	OK
21	0.012	0.230	5.22	OK
22	0.005	0.230	2.24	OK
23	0.008	0.230	3.49	OK
24	0.005	0.230	1.99	OK
25	0.008	0.230	3.67	OK
26	0.006	0.230	2.82	OK
27	0.009	0.230	3.71	OK
28	0.004	0.230	1.70	OK
29	0.010	0.230	4.47	OK
30	0.003	0.230	1.33	OK
31	0.005	0.230	2.04	OK
32	0.004	0.230	1.53	OK
33	0.008	0.230	3.32	OK
34	0.003	0.230	1.48	OK
35	0.005	0.230	2.35	OK
36	0.003	0.230	1.21	OK
37	0.005	0.230	2.01	OK
38	0.003	0.230	1.49	OK
39	0.007	0.230	3.04	OK
40	0.007	0.230	3.11	OK

3.6 VOLTAGE FLUCTUATIONS (FLICKER) TEST

3.6.1 LIMITS

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

3.6.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	3 kVA single Phase Harmonics & Flicker Measuring System	Teseq	ProfLine 2103	1705A04171	Aug. 23, 2021
2	Measurement Software	California	CTS4 Version 4.23.0	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.

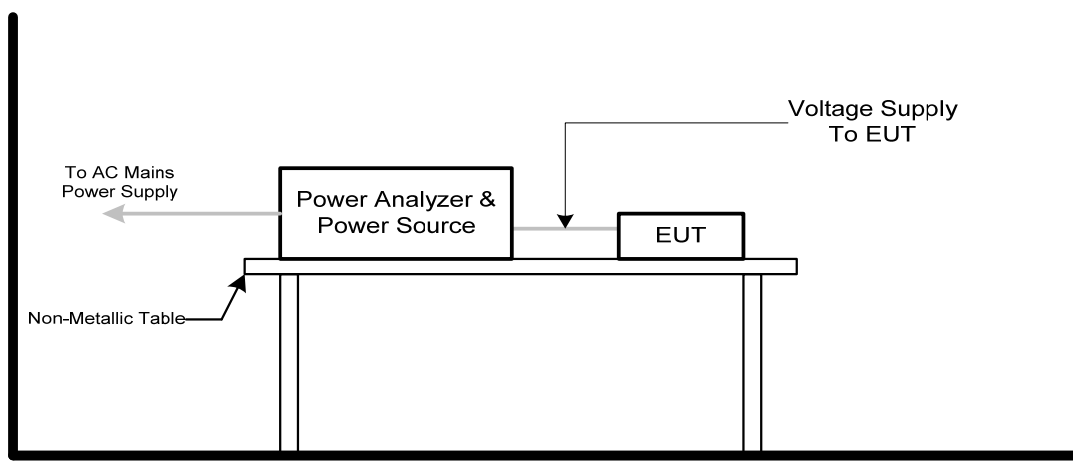
3.6.3 TEST PROCEDURE

- 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

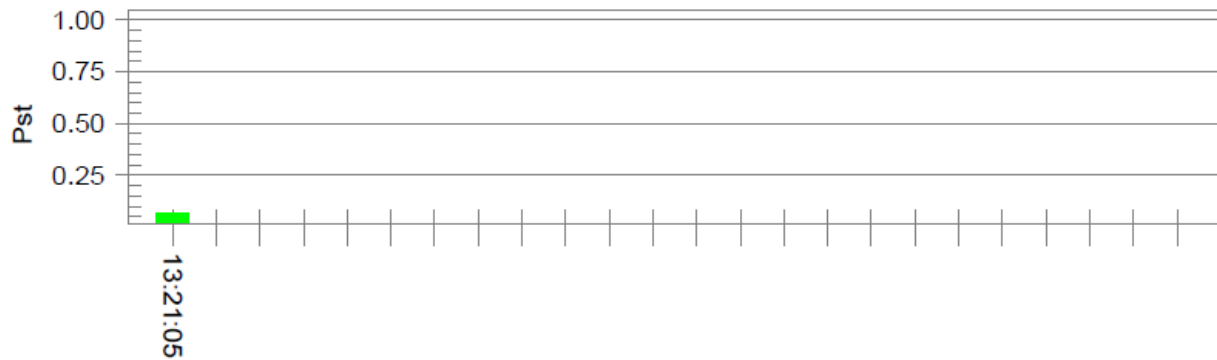


3.6.6 TEST RESULTS

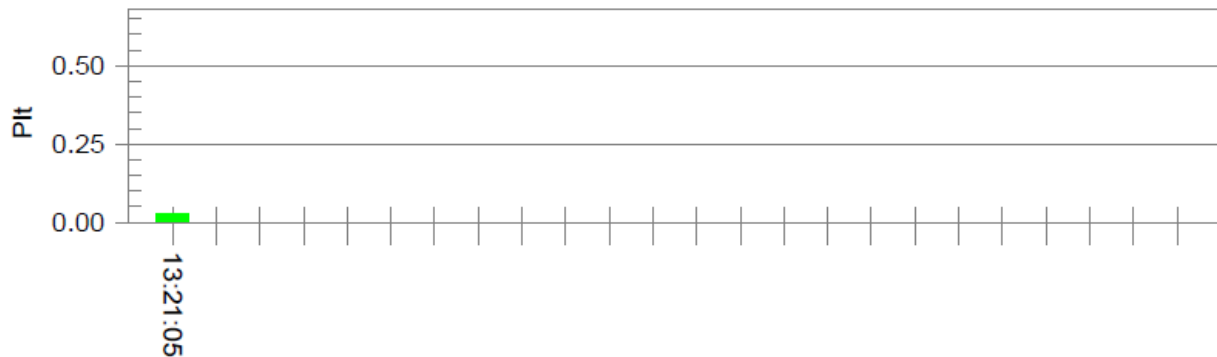
Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.66

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.064

Highest Plt (2 hr. period): 0.028

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass

Test limit: 0.650 Pass

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SPECIFICATION LEVEL/CRITERIA-EN 55035

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

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, unintentional 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. Areboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

4.3.1 TEST SPECIFICATION

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

4.3.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	Teseq	NSG 437	1133	May 12, 2021

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

All calibration period of equipment list is one year.

4.3.3 TEST PROCEDURE

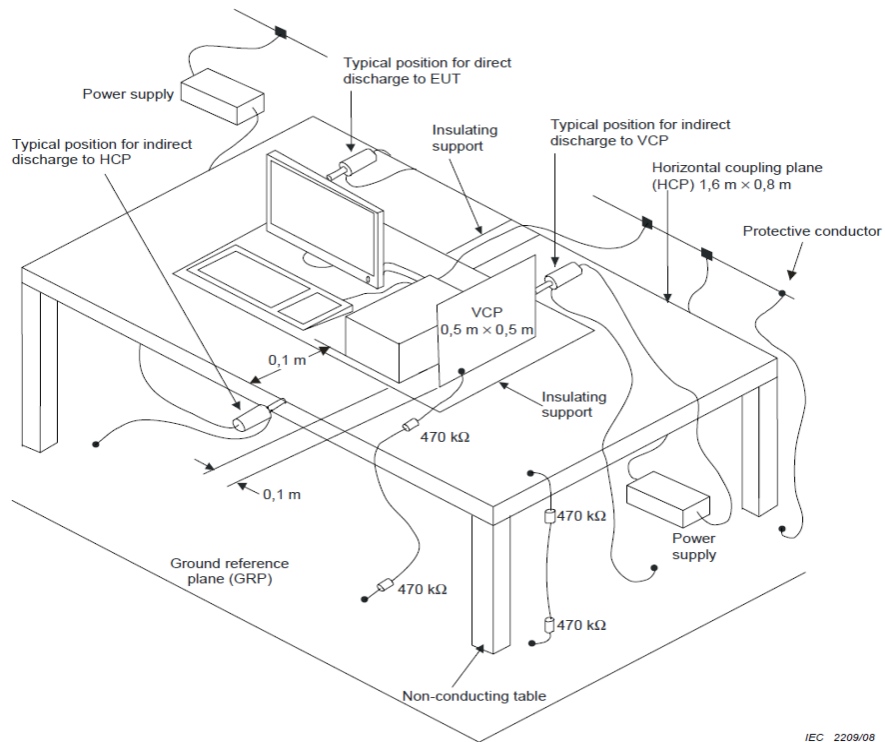
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



IEC 2209/08

4.3.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

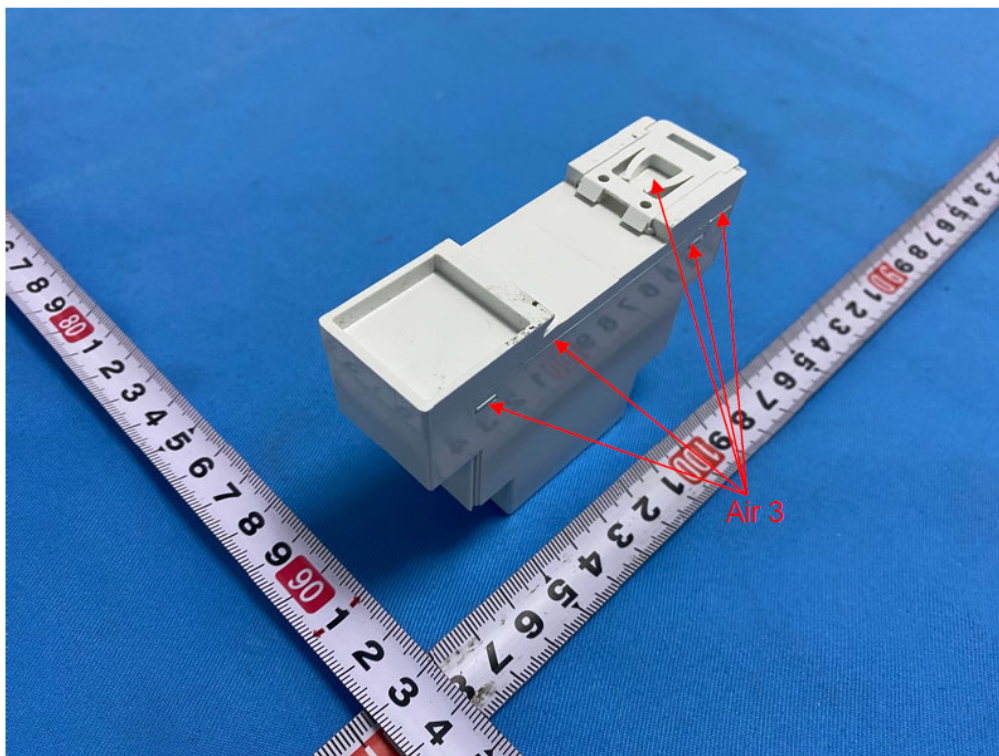
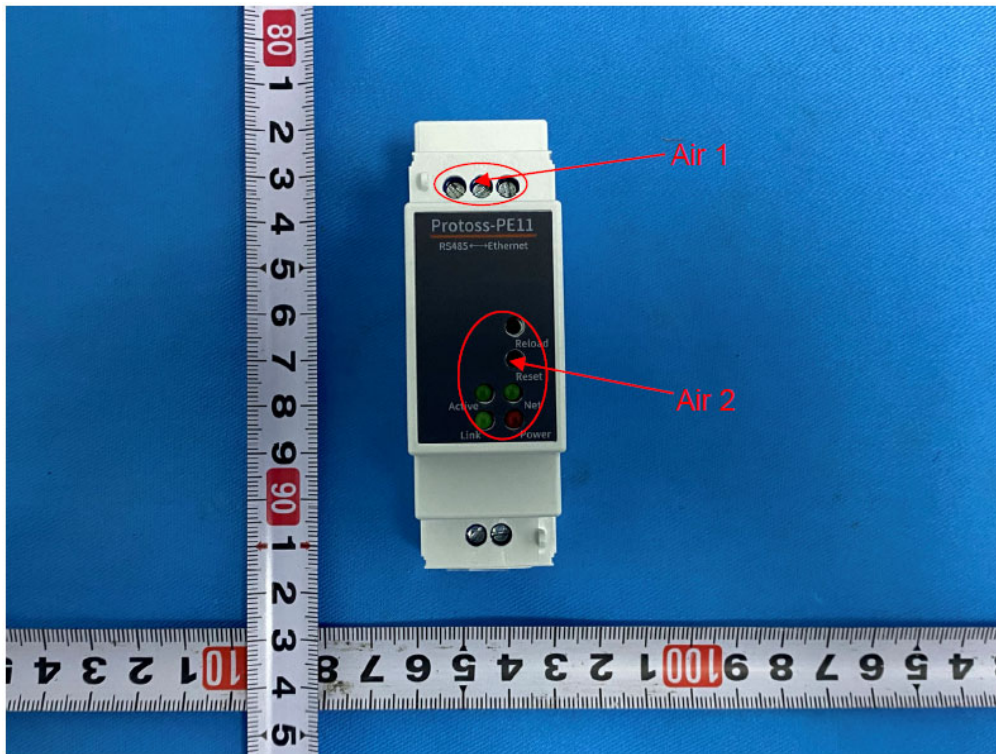
Mode	Air Discharge								Contact Discharge					
Test Level	2kV		4kV		8kV		- kV		2kV		4kV		-kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	B	B	-	-	A	A	A	A	-	-
2	A	A	A	A	B	B	-	-	-	-	-	-	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-
4	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B								B					
Result	B								A					

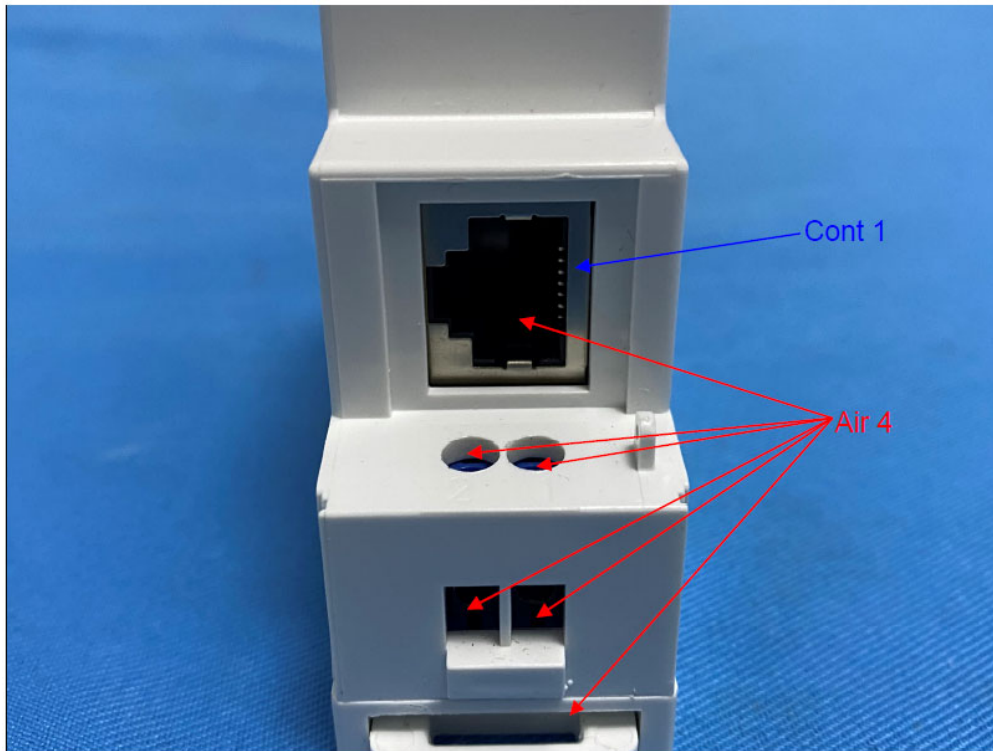
Mode	HCP Contact Discharge						VCP Contact Discharge					
Test Level	2kV		4kV		-kV		2kV		4kV		-kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	-	-	A	A	A	A	-	-
2	A	A	A	A	-	-	A	A	A	A	-	-
3	A	A	A	A	-	-	A	A	A	A	-	-
4	A	A	A	A	-	-	A	A	A	A	-	-
Criteria	B						B					
Result	A						A					

Note:

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

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





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

4.4.1 TEST SPECIFICATION

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

4.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Microwave Log.-Per. Antenna	Schwarzbeck	STLP 9129	9129 027	Mar. 25, 2023
2	Radiated Immunity test system	Teseq	ITS 6006	37668	Aug. 23, 2021
3	RF Switch network	Teseq	RFB 2000	45816	N/A
4	Power meter	Teseq	PM 6006	75508	Aug. 23, 2021
5	Power meter	Teseq	PM 6006	75509	Aug. 23, 2021
6	40dB Dual Directional Coupler	Werlatone	C5982-10	112687	N/A
7	40dB Dual directional coupler	Werlatone	C10117-10	112805	N/A
8	Power Amplifier	MILMEGA	80RF1000-300	1078551	Aug. 23, 2021
9	Power Amplifier	MILMEGA	AS0860-50/50	1078552	Aug. 23, 2021
10	Test Cable	emci	S10172B	N/A	N/A
11	Test Cable	emci	S10172B	N/A	N/A
12	Test Cable	emci	RG214/U	N/A	N/A
13	Test Cable	emci	S10172B	N/A	N/A
14	Measurement Software	AUDIX	i2 20170414a Ver5	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.

4.4.3 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:

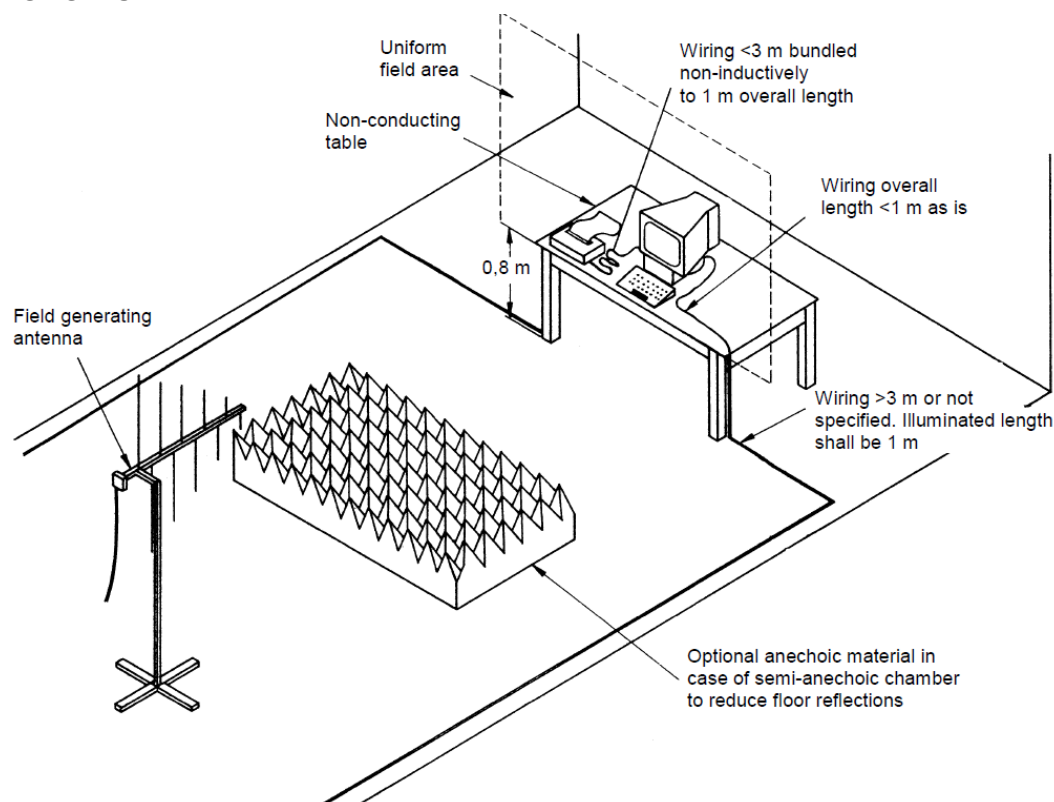
The EUT installed in a representative system as described in IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

- 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. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

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		

4.5 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT)

4.5.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-4
Required Performance	B
Test Voltage	AC Power Ports: ± 1 kV Signal 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.

4.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Aug. 23, 2021
2	Burst/EFT Coupling Clamp	Teseq	CDN 3425	3049	Aug. 23, 2021
3	Measurement Software	Teseq	Win 3000 Version 1.3.2	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

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.

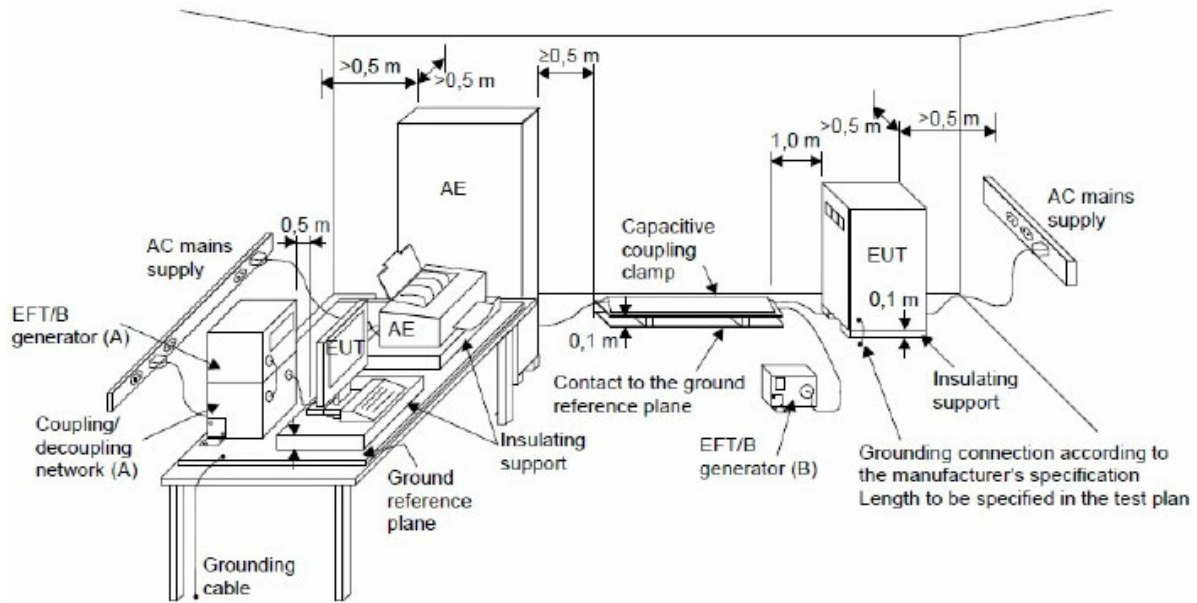
The other condition as following manner:

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

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
Signal Port	Ethernet Port	+	5 kHz	B	B	B
		-	5 kHz	B		

4.6 SURGE IMMUNITY TEST (SURGE)

4.6.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-5
Required Performance	B (For AC/DC Power Ports) C (For Signal ports)
Wave-Shape	1.2/50(8/20) Tr/Th μ s combination wave 10/700(5/320) Tr/Th μ s combination wave
Test Voltage	AC Power Port: ± 1 kV Signal/Telecommunication Port: ± 1 kV
Generator Source Impedance	2 Ω of the low-voltage power supply network. 40 Ω (15 Ω +25 Ω) between outdoor unshielded symmetrical interconnection line and ground when use 10/700(5/320) waveform.
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.

4.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Aug. 23, 2021
2	Measurement Software	Teseq	Win 3000 Version 1.3.2	N/A	N/A
3	Signal & Data line coupling network	Teseq	CDN 118	44678	Aug. 23, 2021
4	Signal & Data line coupling network	Teseq	CDN 118	44679	Aug. 23, 2021
5	Coupler	Teseq	INA170	N/A	N/A
6	Matching resistor network	Teseq	INA185	44060	Aug. 23, 2021
7	Matching resistor network	Teseq	INA185	44058	Aug. 23, 2021

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

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

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

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

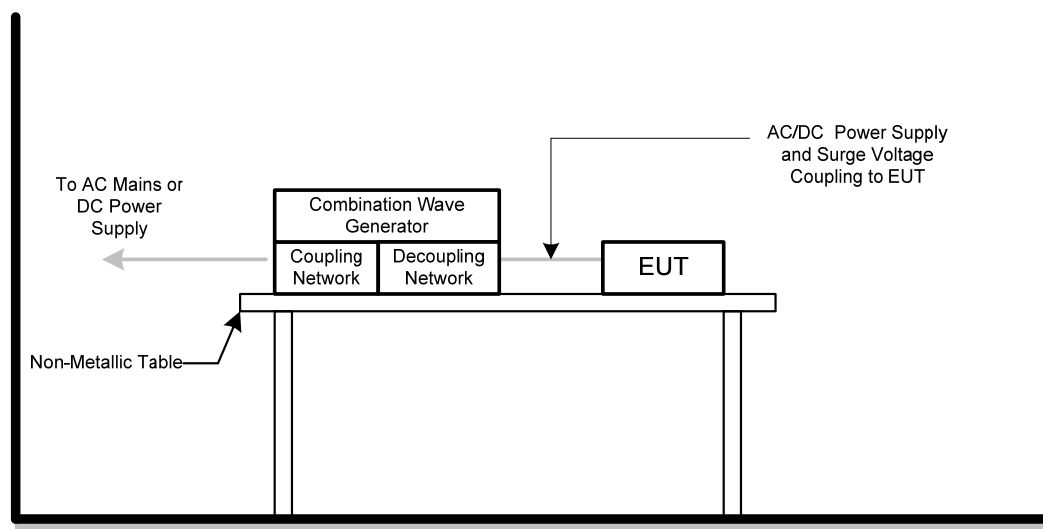
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT :

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

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

Wave Form EUT Ports Tested	10/700(5/320)Tr/Thµs						Criterion	Result
	Polarity	Phase	Voltage					
			0.5 kV	1kV	-- kV	-- kV		
Analogue/digital data ports (Ethernet Port)	+/-	-	-	B	-	-	C	B

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

4.7.1 TEST SPECIFICATION

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

4.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Compact immunity test system	Teseq	NSG 4070B-35	45751	Aug. 23, 2021
2	Attenuator	Teseq	ATN 6050	16121502	Aug. 23, 2021
3	50Ω Terminator	SHX	TF2-1G-A	17051603	Mar. 20, 2022
4	Measurement Software	Teseq	NSG 4070 Version 1.3.0.1	N/A	N/A
5	CDN	Teseq	CDN M016S	45669	Aug. 23, 2021
6	CDN	Teseq	CDN T8-10	45611	Aug. 23, 2021

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

The equipment to be tested is placed on an insulating support of 0.1m height above a reference ground plane. All cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

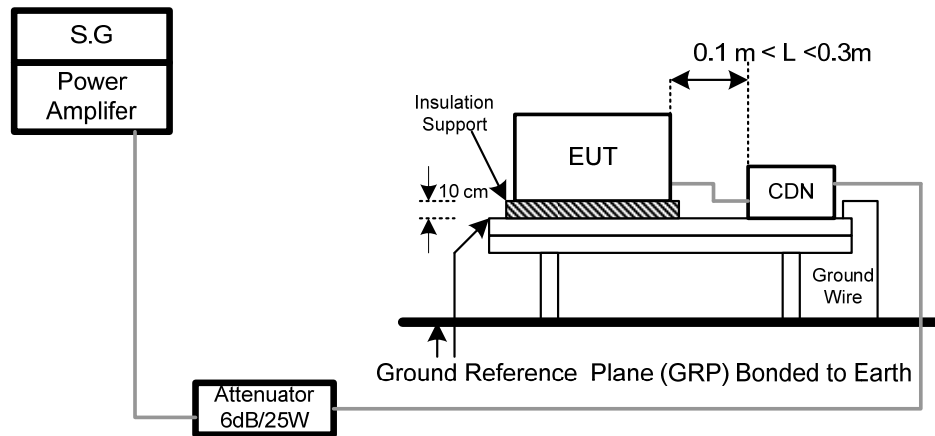
The other condition as following manner:

- The field strength level was 3 V (unmodulated, r.m.s.) in 0.15 MHz - 10 MHz.
The field strength level was 3V to 1V (unmodulated, r.m.s.) in 10 MHz - 30 MHz.
The field strength level was 1V (unmodulated, r.m.s.) in 30 MHz - 80 MHz.
- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10⁻³ decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

Test Ports (Mode)	Freq.Range (MHz)	Field Strength (unmodulated, r.m.s.)	Modulation	Criteria	Results
Input/ OutputAC. Power Port	0.15 - 10	3V	AM Modulated 1000Hz, 80%	A	A
	10 - 30	3V to 1V			
	30 - 80	1V			
Signal Line (Ethernet Port)	0.15 - 10	3V		A	A
	10 - 30	3V to 1V			
	30 - 80	1V			

4.8 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

4.8.1 TEST SPECIFICATION

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

4.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	MFO/Magnetic Field Option	Teseq	MFO 6501	1006	Mar. 21, 2022
2	Magnetic Field Coils	Teseq	INA 702	328	Mar. 21, 2022

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

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.

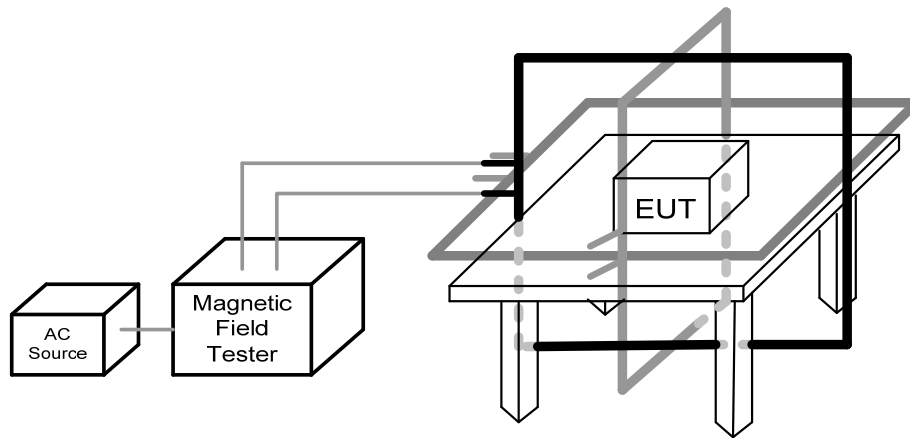
The other condition as following manner:

- 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.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



4.8.6 TEST RESULTS

Test Voltage	AC 230V/50Hz
Test Mode	FULL SYSTEM

50Hz

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

60Hz

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

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

4.9.1 TEST SPECIFICATION

Basic Standard	IEC 61000-4-11
Required Performance	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

4.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	4055	Aug. 23, 2021
2	Measurement Software	Teseq	Win 3000 Version 1.3.2	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.

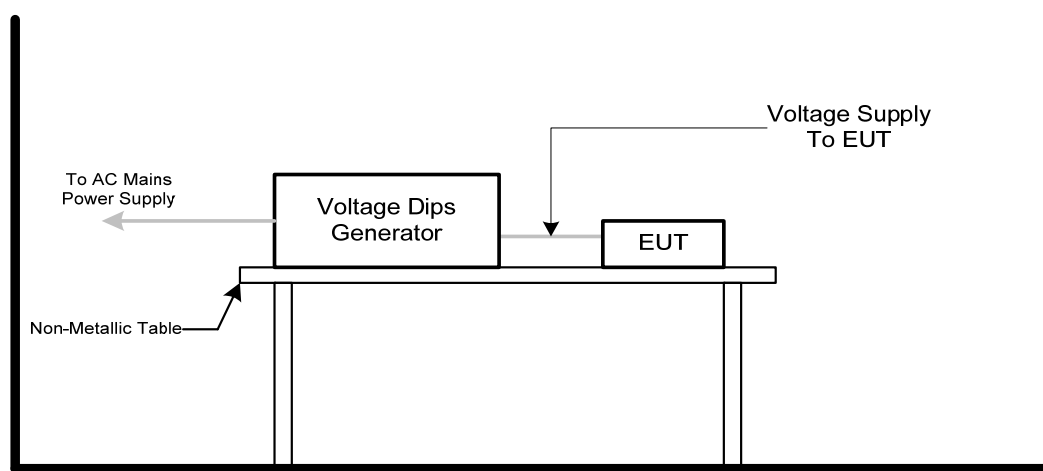
4.9.3 TEST PROCEDURE

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.

4.9.4 DEVIATION FROM TEST STANDARD

No deviation

4.9.5 TEST SETUP



4.9.6 TEST RESULTS

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

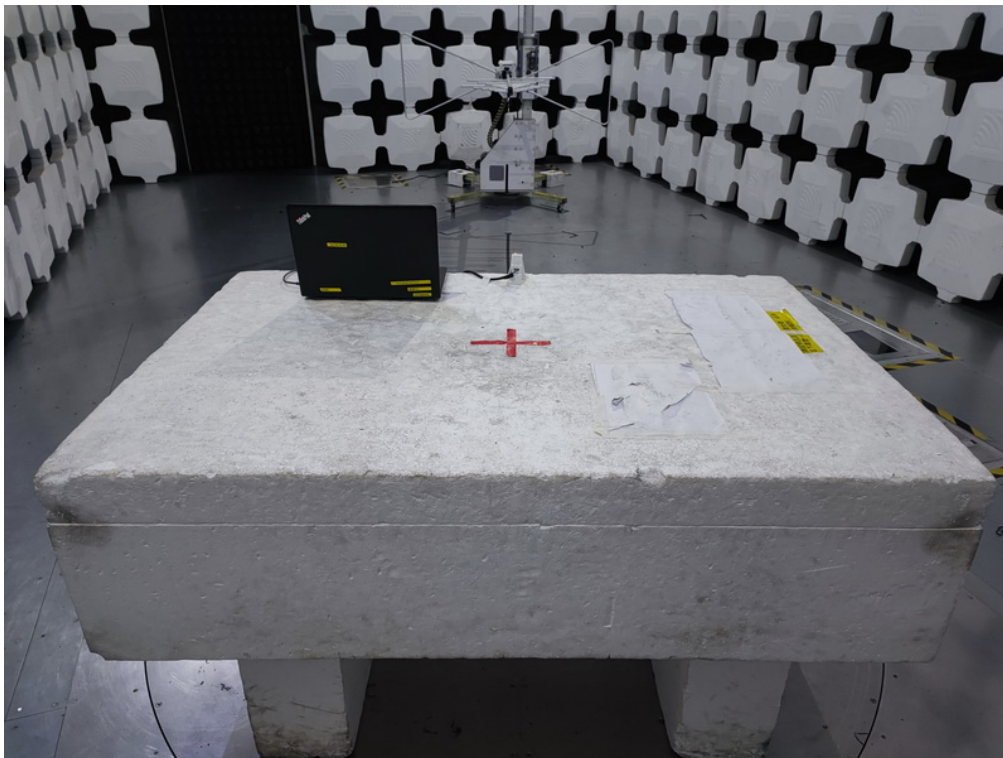
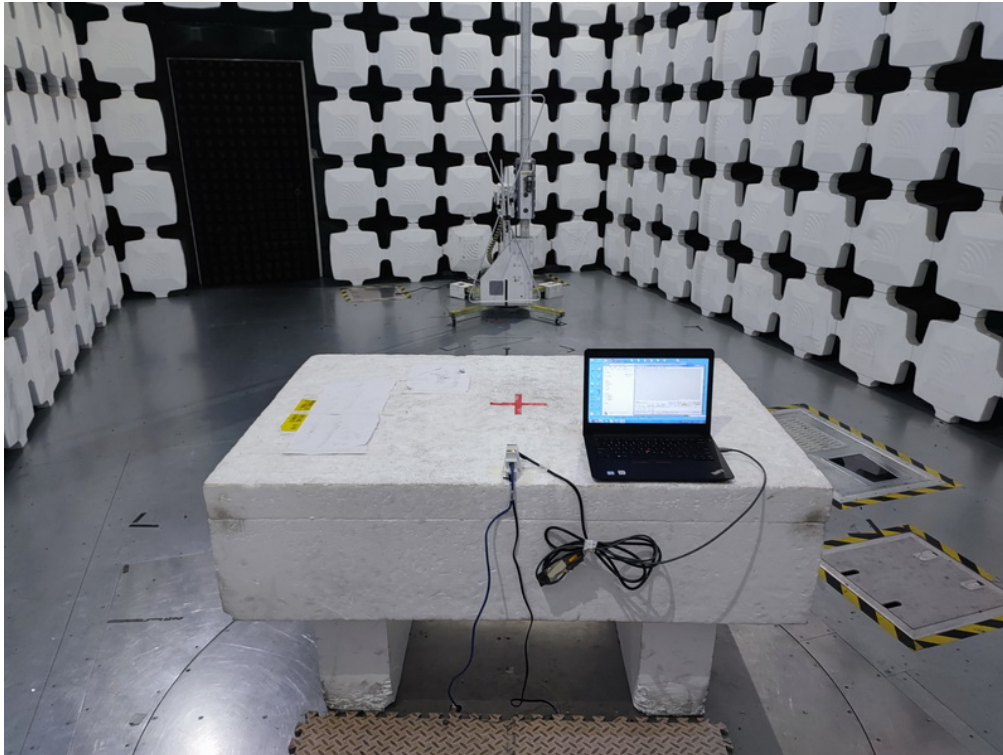
AC 100V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	C

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

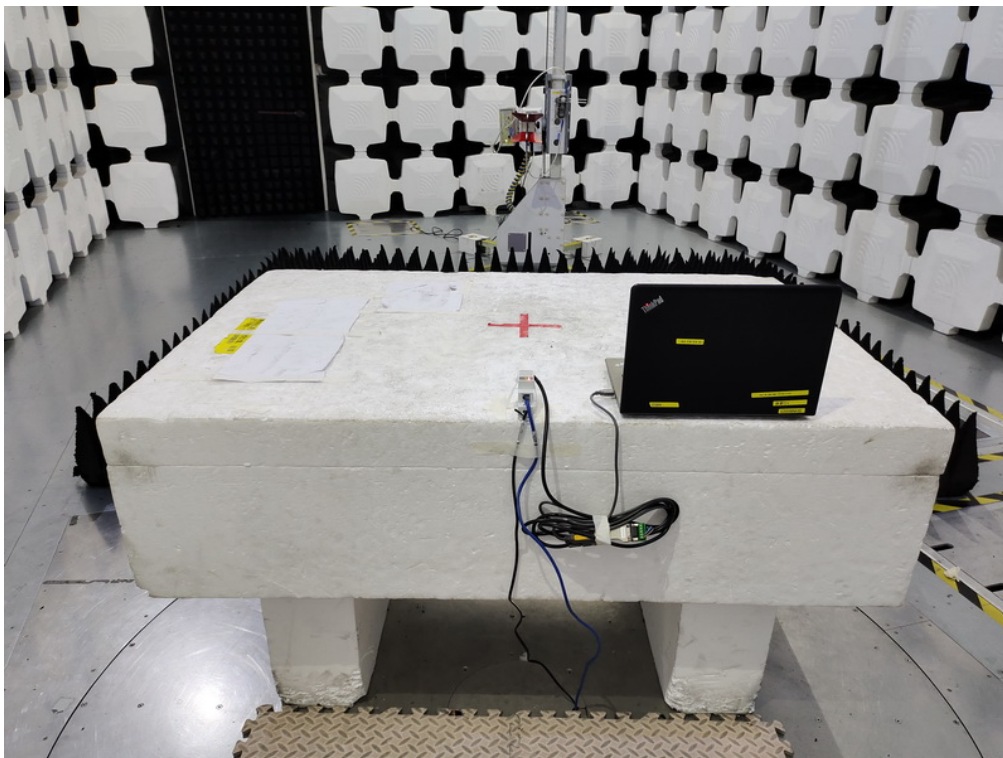
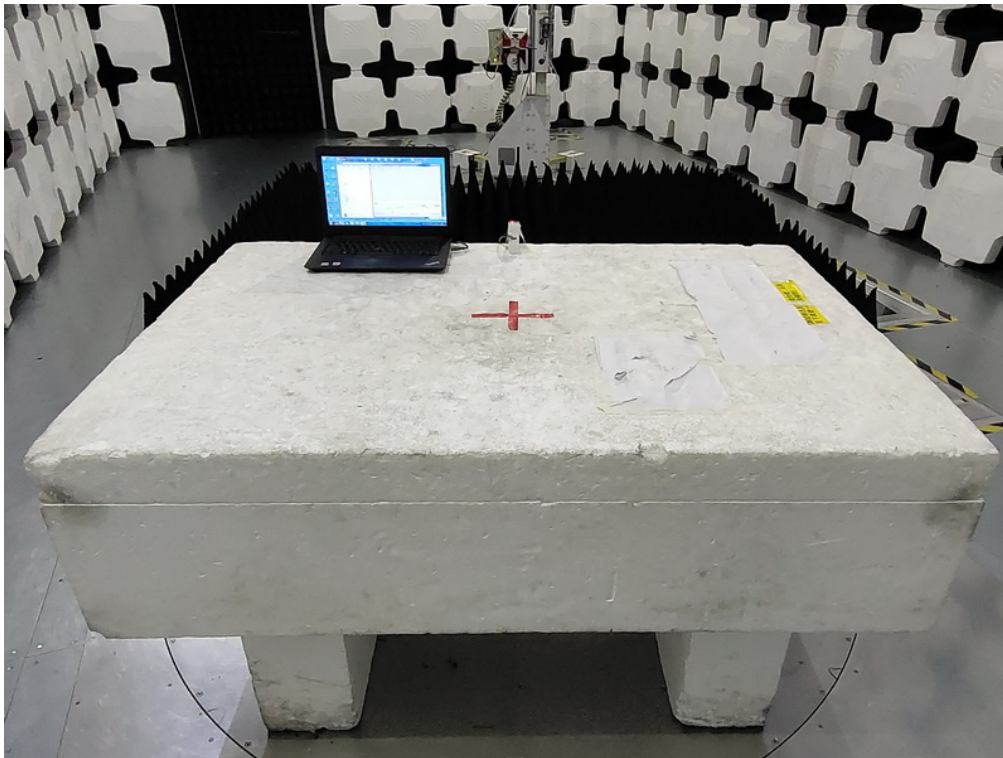
AC 240V/50Hz				
Item	Residual Voltage	Cycle	Criteria	Results
Voltage dips	<5%	0.5	B	A
Voltage dips	70%	25	C	A
Voltage Interruption	<5%	250	C	C

5. EUT TEST PHOTO

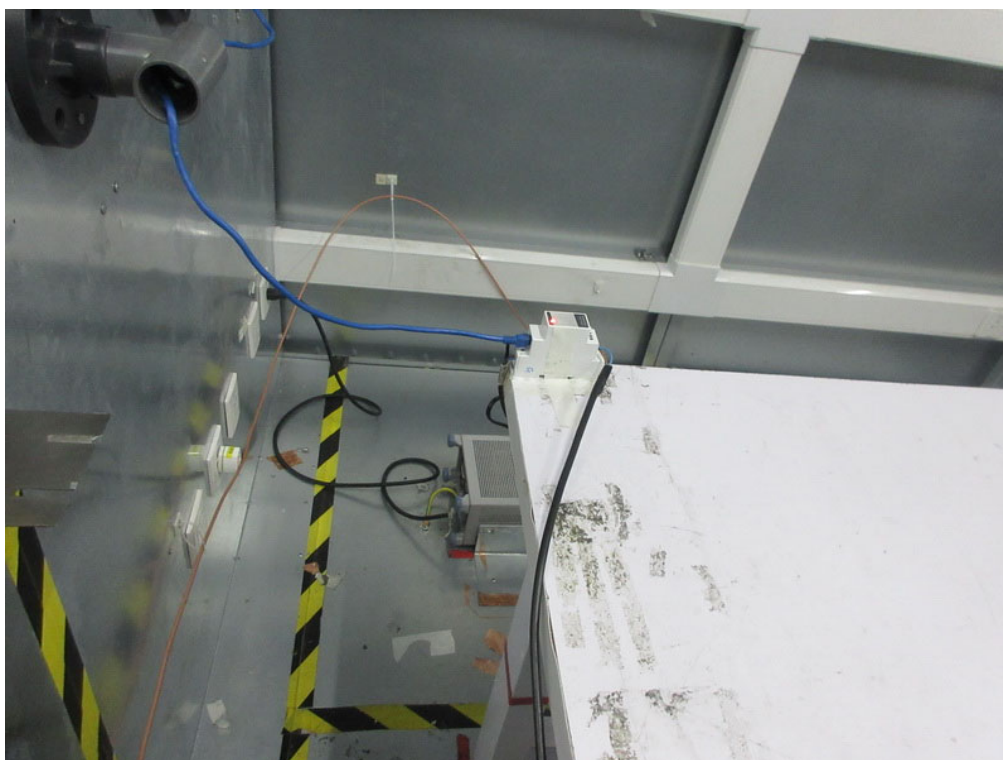
Radiated emissions up to 1 GHz



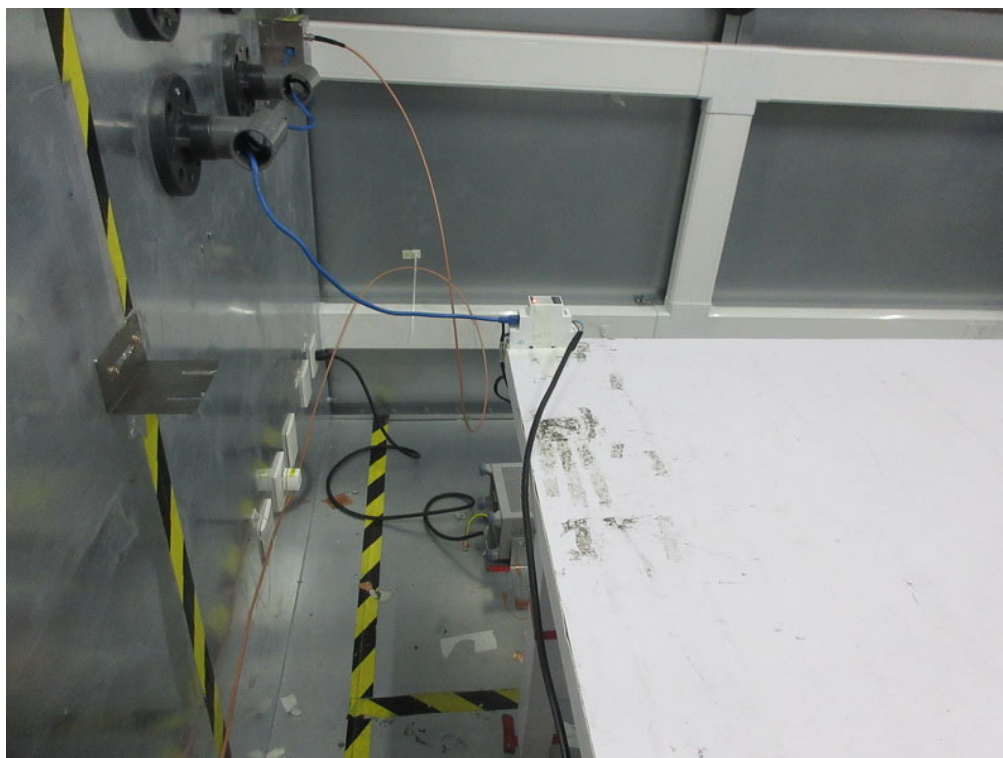
Radiated emissions above 1 GHz



Conducted emissions AC mains power port



Asymmetric mode conducted emissions(AAN)



End of Test Report