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检测
TESTING
CNAS L4062



TEST REPORT

Reference No. : WTF22X12245071W003
Manufacturer : Mid Ocean Brands B.V.
Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory : 111033
Product Name : A4 portfolio with power charging
Model No. : MO9401
Standards : ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.1.1 (2019-03)
Date of Receipt sample : 2022-12-05
Date of Test : 2022-12-05 to 2023-03-13
Date of Issue : 2023-03-13
Test Report Form No. : WTX_ETSI EN 301 489_1_2019W
Test Result : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

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Report version

Version No.	Date of issue	Description
Rev.00	2023-03-13	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	A4 portfolio with power charging
Trade Name:	/
Model No.:	MO9401
Adding Model(s):	/
Rated Voltage:	Input: DC 5V, 2A Output: DC 5V, 2.1A(Wired) Output: DC 5V, 1A(Wireless) Battery DC 3.7V
Battery capacity:	4000mAh
Software Version:	Rev:1.31
Hardware Version:	Rev:2.0
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
EN 303417	
Frequency Range:	100-200kHz
Radiated H-Field:	35.40dBuA/m(@3m)
Type of Antenna:	Coil Antenna
<i>Note: The Antenna Gain is provided by the customer and can affect the validity of results.</i>	



1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 301 489-1 V2.2.3 (2019-11): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility.

ETSI EN 301 489-3 V2.1.1 (2019-03): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.



1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Wireless Charging + USB Working	Connect to the adapter; AC230V/50Hz for adapter; Wireless charging: output 5W; Full load of working
TM2	Wireless Charging + USB Working	Discharging; Wireless charging: input 5W; Full load of working
TM3	Wireless Charging	TT,TR,CT,CR for EMS testing

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	0.39	Unshielded	Without Ferrite

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
wireless charging tester	YBZ	YBZ wireless charging tester	/
Adapter	Xiaomi	MDY-08-ES	/



1.6 Performance Criteria for EMS

➤ EN 301 489-3, The performance criteria are:

In the table below:

- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures for the phenomenon in ETSI EN 301 489-1 [1], clause 9.

Table 2: Performance Requirements

Criterion	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in ETSI EN 301 489-3 [1], clause 5.

Where the EUT has more than one mode of operation (see clause 4.5.2), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.



1.7 Measurement Uncertainty

Measurement uncertainty	
Parameter	Uncertainty
Uncertainty for Radiated Emission in 3m chamber	@30-200MHz $\pm 4.52\text{dB}$ @0.2-1GHz $\pm 5.56\text{dB}$ @1-6GHz $\pm 3.84\text{dB}$ @6-18GHz $\pm 3.92\text{dB}$
Uncertainty for Conducted Emission	@9-150kHz $\pm 3.74\text{dB}$ @0.15-30MHz $\pm 3.34\text{dB}$
Uncertainty for Harmonic test	3.26%
Uncertainty for Flicker test	4.76%
Uncertainty for RS test	21%, k=2
Uncertainty for CS test	29%, k=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Uncertainty for EFT test	
Uncertainty for Surges test	
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	
Uncertainty for PFMF test	



1.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
☒ Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2022-03-22	2023-03-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
Amplifier	HP	8447F	2805A03475	2022-12-30	2023-12-29
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2023-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-20	2023-03-19
☒ Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2022-03-22	2023-03-21
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2022-03-22	2023-03-21
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-03-22	2023-03-21
Amplifier	C&D	PAP-1G18	2002	2022-03-22	2023-03-21
Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2021-04-27	2023-04-26
Pre-amplifier	Schwarz beck	BBV 9721	9721-031	2022-03-25	2023-03-24
☐ Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2023-04-08
Amplifier	Agilent	8447D	2944A10179	2022-03-22	2023-03-21
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2022-03-25	2023-03-24
☐ Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2022-12-30	2023-12-29
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2023-05-27
Amplifier	HP	8447F	2944A03869	2022-03-22	2023-03-21
☒ Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2022-03-22	2023-03-21
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2022-03-25	2023-03-24
AC LISN	Schwarz beck	NSLK8126	8126-224	2022-03-22	2023-03-21
8-WIRE LISN	Schwarz beck	8158	CAT3-8158-0059	2022-03-22	2023-03-21
8-WIRE LISN	Schwarz beck	8158	CAT5-8158-0117	2022-03-22	2023-03-21
☐ Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	10129	2022-03-22	2023-03-21
LISN	Rohde & Schwarz	ENV 216	100097	2022-03-22	2023-03-21
EMF					
VDH Test Head	AFJ	VDH 30	SC022Z	2022-03-25	2023-03-24
3 Loop Antenna					
Loop Antenna	ZHINAN	ZN30401	19037	2021-04-26	2023-04-25



Clamp					
Clamp	Luthi	MDS21	3809	2022-03-28	2023-03-27
PFMF					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2022-03-22	2023-03-21
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2022-03-22	2023-03-21
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2022-03-22	2023-03-21
H/F					
Digital Power Analyzer	California Instrument	CTS	72831	2022-03-22	2023-03-21
Power Source	California Instrument	5001IX-CTS-400	25965	2022-03-22	2023-03-21
ESD					
ESD Generator	LIONCEL	ESD-203B	0170901	2022-03-28	2023-03-27
EFT/SURGE/DIPS					
Transient 2000	EMC PARTNER	TRA2000	863	2022-03-22	2023-03-21
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2022-03-22	2023-03-21
CS					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2022-12-30	2023-12-29
Attenuator	EMTEST	MA-5100/6BF2	1009	2022-03-22	2023-03-21
CDN	Luthi	L-801M2/M3	2665	2022-03-22	2023-03-21
CDN	LIONCEL	CDN-T8	0210401	2022-03-25	2023-03-24
EM Clamp	TESEQ	KEMZ801A	45028	2022-03-25	2023-03-24
RS					
Signal Generator	HP	8688B	3438A00604	2022-03-22	2023-03-21
Power Meter	KEITHLEY	3500	1162591	2022-03-22	2023-03-21
Power Meter	KEITHLEY	3500	1121428	2022-03-22	2023-03-21
RF Power Amplifier	MicoTop	MPA-80-1000-250	MPA1906239	2022-03-22	2023-03-21
RF Power Amplifier	MicoTop	MPA-80-6000-100	MPA1906238	2022-03-22	2023-03-21
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A
Power Meter	Agilent	E4419B	GB42420578	2022-03-22	2023-03-21



Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

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2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
ETSI EN 301 489-1	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Pass
	8.5	Harmonic Current Emissions	Pass
	8.6	Voltage Fluctuations and Flicker	Pass
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	Pass
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Pass
	9.8	Surges	Pass
Pass: The EUT complies with the essential requirements in the standard. Fail: The EUT does not comply with the essential requirements in the standard. N/A: Not applicable.			

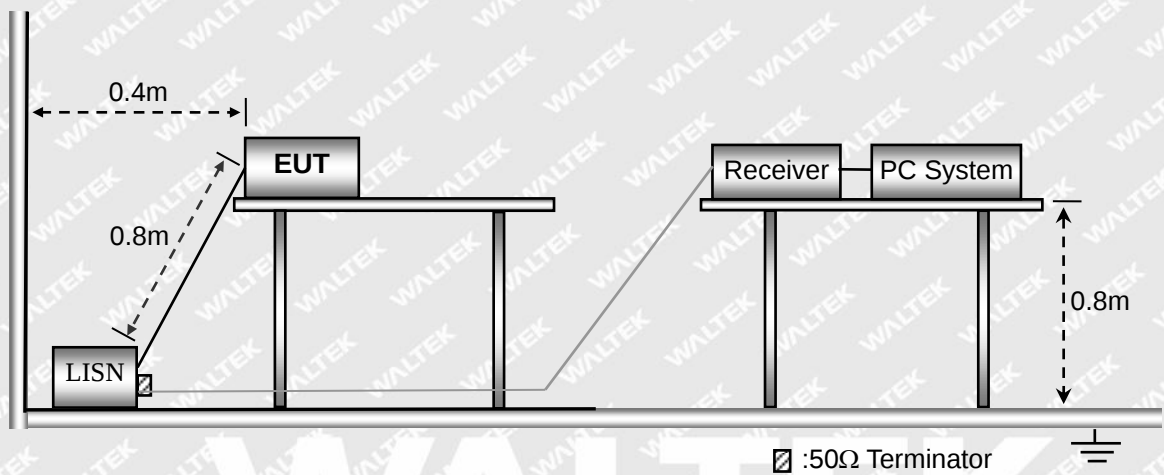


3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

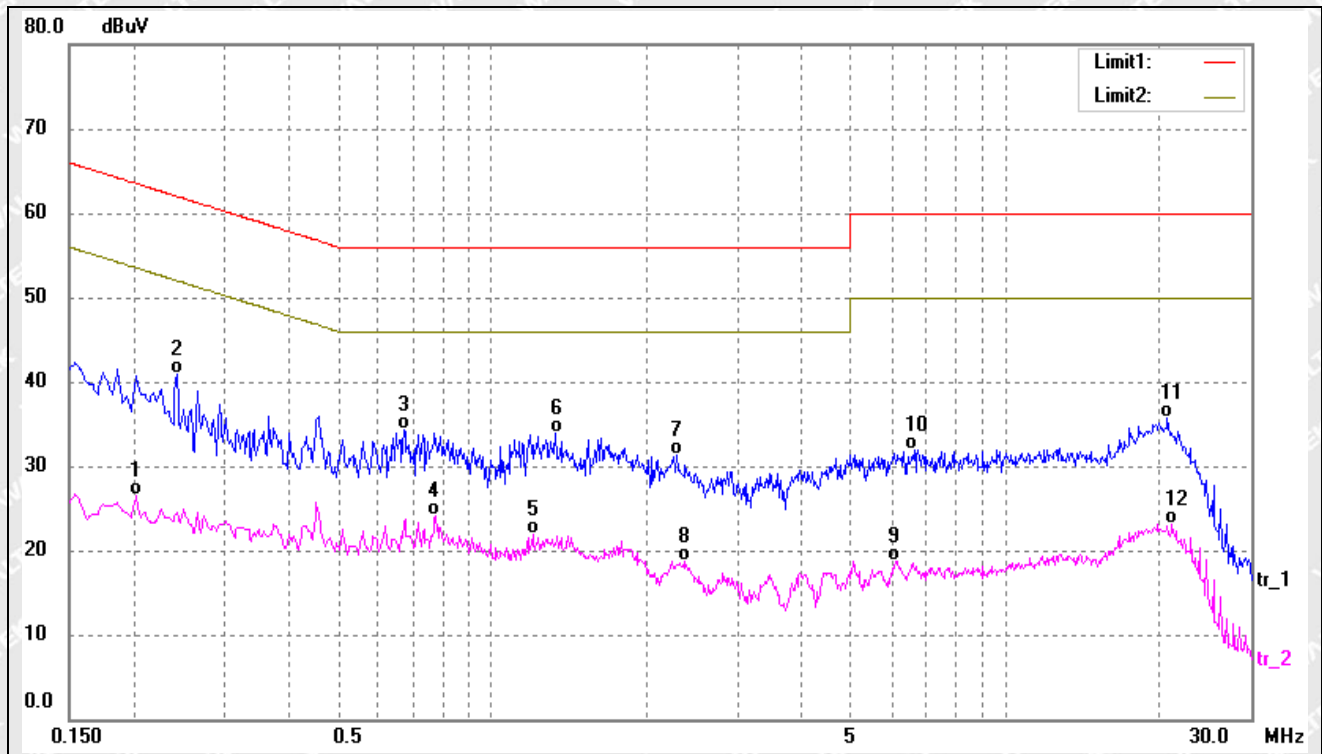
Temperature:	23.5° C
Relative Humidity:	54 %
ATM Pressure:	1015 mbar

3.4 Conducted Emissions Test Data

Note: Only show the worst case in the test report.



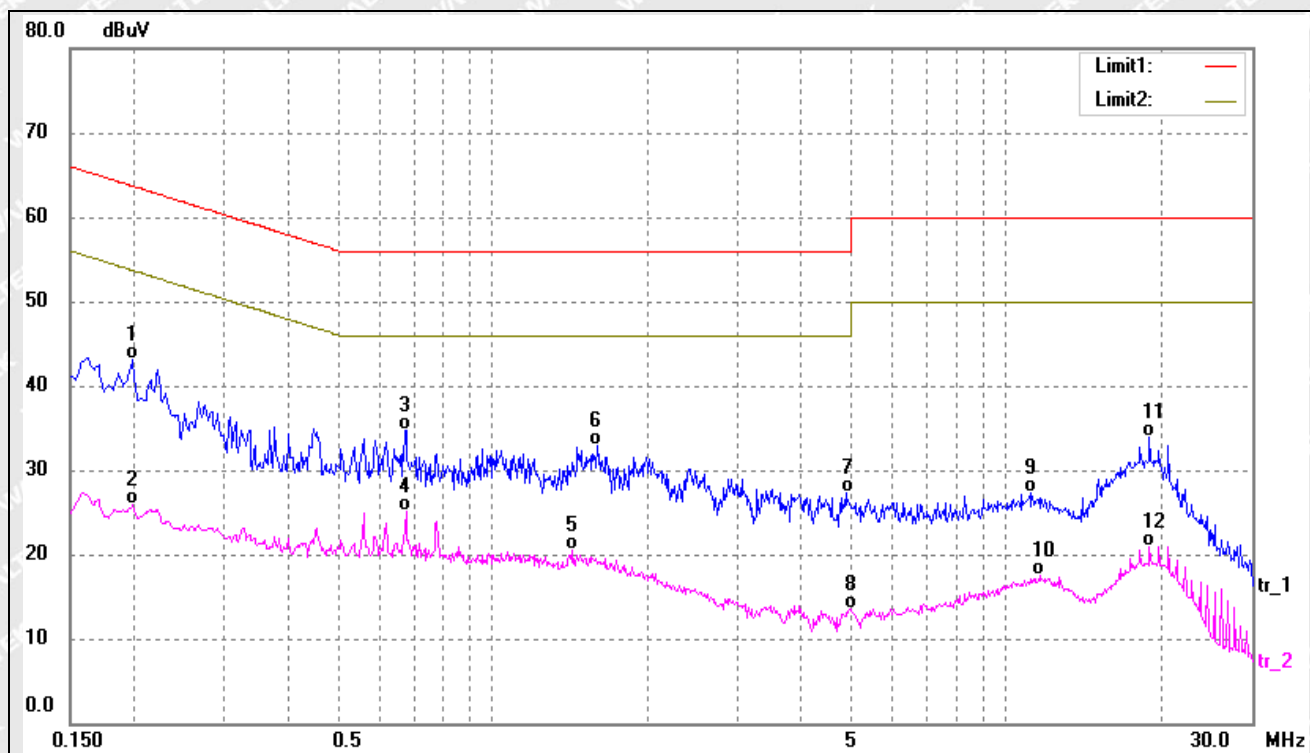
Test mode:	TM1	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2020	16.21	10.30	26.51	53.52	-27.01	AVG
2*	0.2420	30.68	10.27	40.95	62.02	-21.07	QP
3	0.6740	24.10	10.20	34.30	56.00	-21.70	QP
4	0.7780	13.96	10.17	24.13	46.00	-21.87	AVG
5	1.2020	11.77	10.16	21.93	46.00	-24.07	AVG
6	1.3300	23.67	10.17	33.84	56.00	-22.16	QP
7	2.2860	20.98	10.26	31.24	56.00	-24.76	QP
8	2.3780	8.49	10.26	18.75	46.00	-27.25	AVG
9	6.0900	8.38	10.33	18.71	50.00	-31.29	AVG
10	6.6420	21.62	10.34	31.96	60.00	-28.04	QP
11	20.6020	25.26	10.37	35.63	60.00	-24.37	QP
12	21.0780	12.75	10.37	23.12	50.00	-26.88	AVG



Test mode:	TM1	Polarity:	Line
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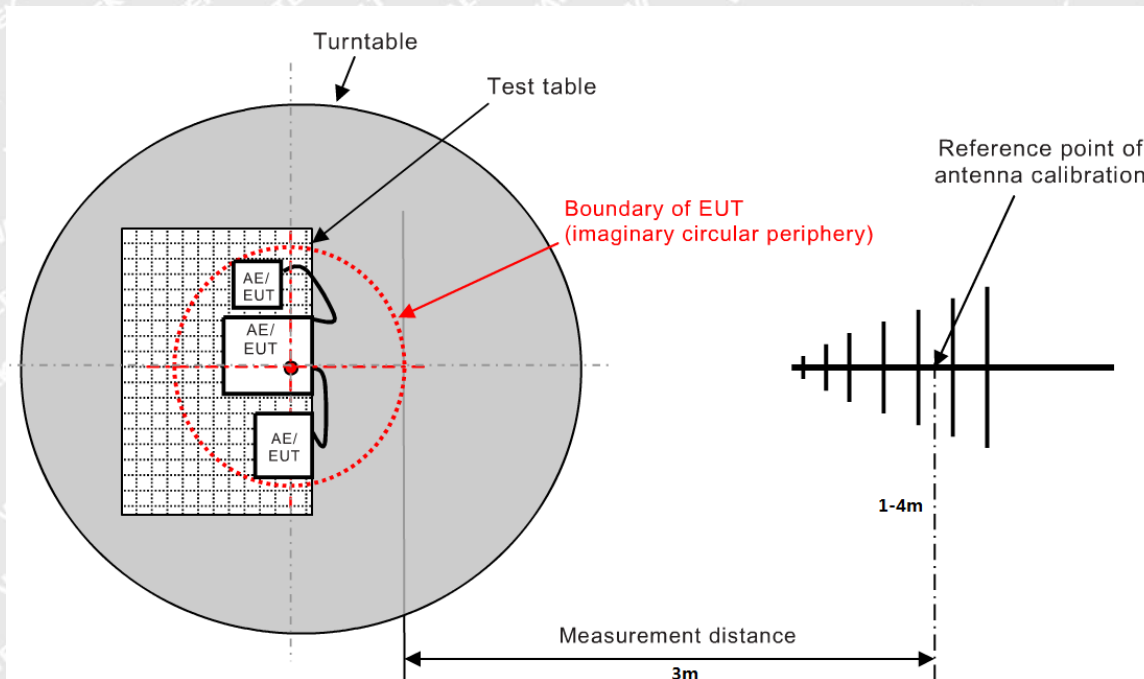
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1*	0.1980	32.74	10.30	43.04	63.69	-20.65	QP
2	0.1980	15.56	10.30	25.86	53.69	-27.83	AVG
3	0.6740	24.45	10.20	34.65	56.00	-21.35	QP
4	0.6780	14.85	10.20	25.05	46.00	-20.95	AVG
5	1.4299	10.33	10.18	20.51	46.00	-25.49	AVG
6	1.5940	22.69	10.21	32.90	56.00	-23.10	QP
7	4.8659	16.93	10.33	27.26	56.00	-28.74	QP
8	4.9980	3.18	10.33	13.51	46.00	-32.49	AVG
9	11.0980	16.97	10.33	27.30	60.00	-32.70	QP
10	11.5620	7.16	10.32	17.48	50.00	-32.52	AVG
11	19.0180	23.48	10.34	33.82	60.00	-26.18	QP
12	19.0180	10.66	10.34	21.00	50.00	-29.00	AVG



4. Radiated Emissions

4.2 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.



4.2 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$



4.3 Environmental Conditions

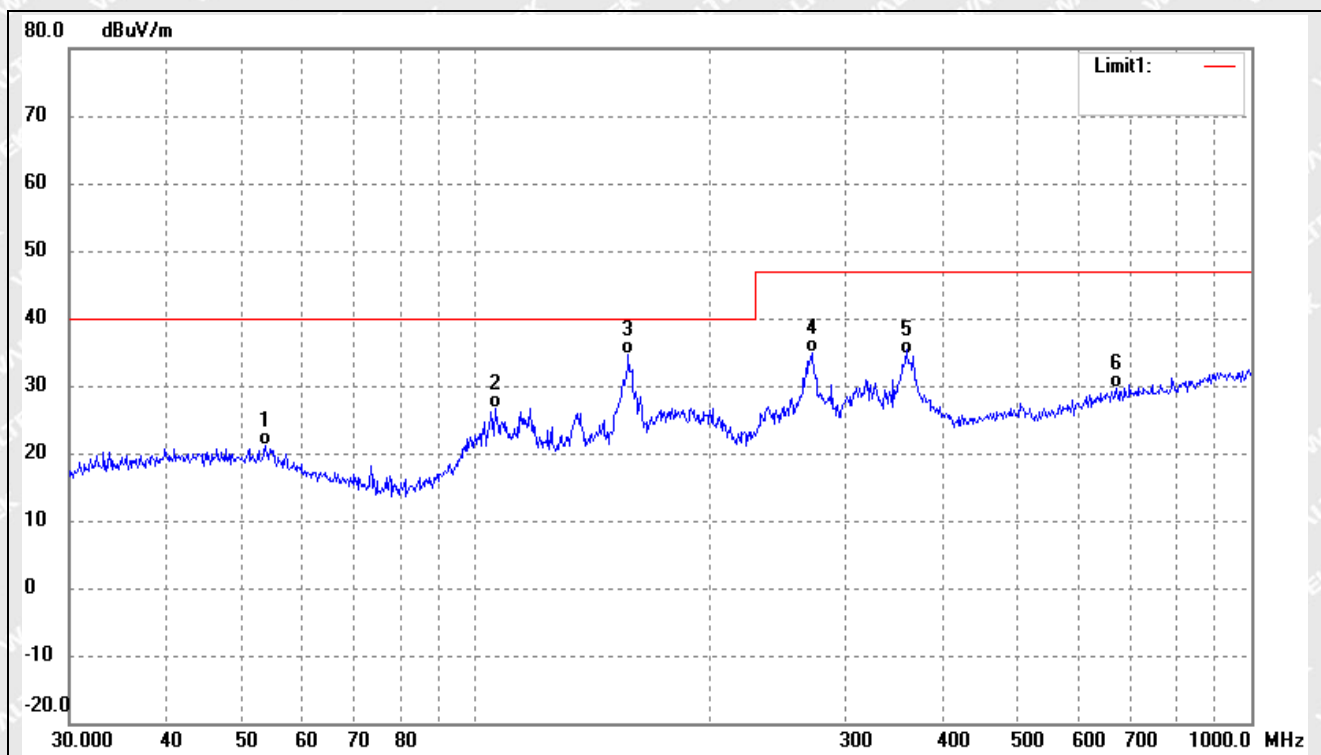
Temperature:	22.5° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

Note: Only show the worst case in the test report

➤ 30MHz to 1GHz

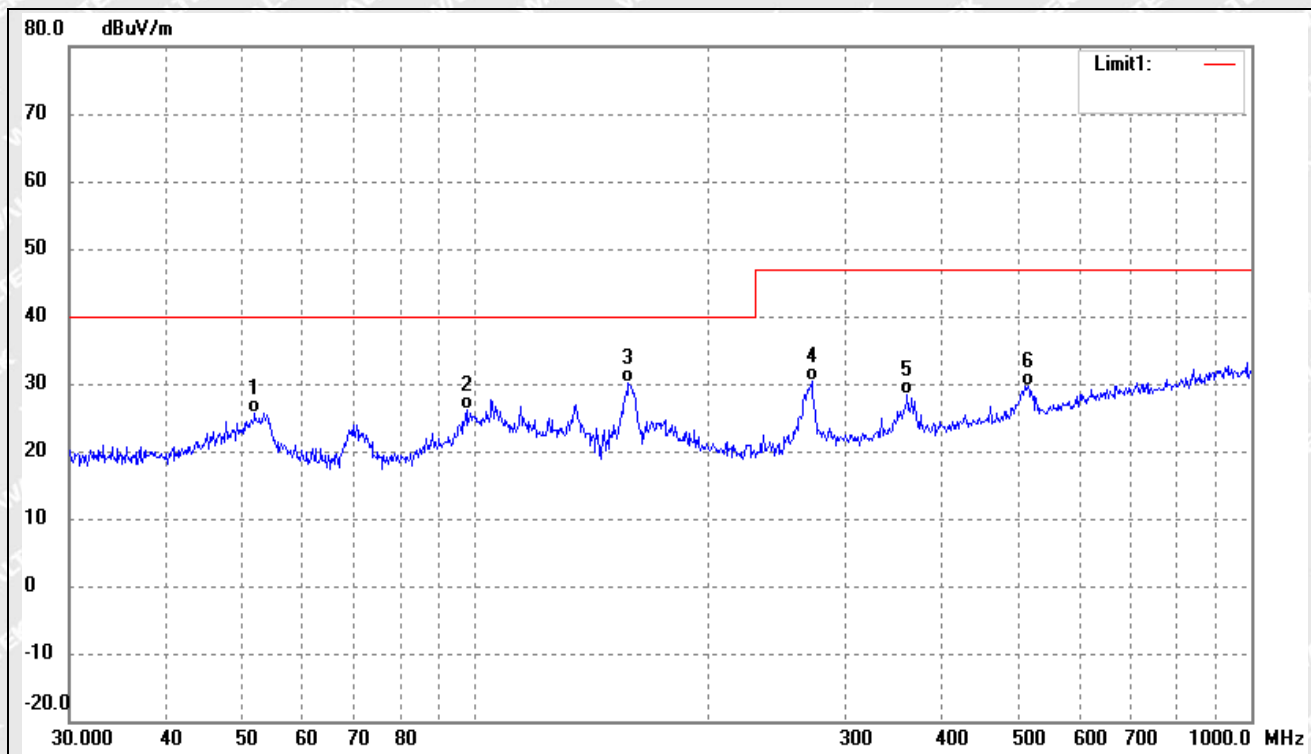
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	53.6931	29.15	-7.95	21.20	40.00	-18.80	-	-	QP
2	106.0126	34.86	-8.11	26.75	40.00	-13.25	-	-	QP
3	157.5588	46.01	-11.28	34.73	40.00	-5.27	-	-	QP
4	271.3245	40.86	-5.98	34.88	47.00	-12.12	-	-	QP
5	360.4476	38.64	-3.97	34.67	47.00	-12.33	-	-	QP
6	670.4892	28.76	0.90	29.66	47.00	-17.34	-	-	QP



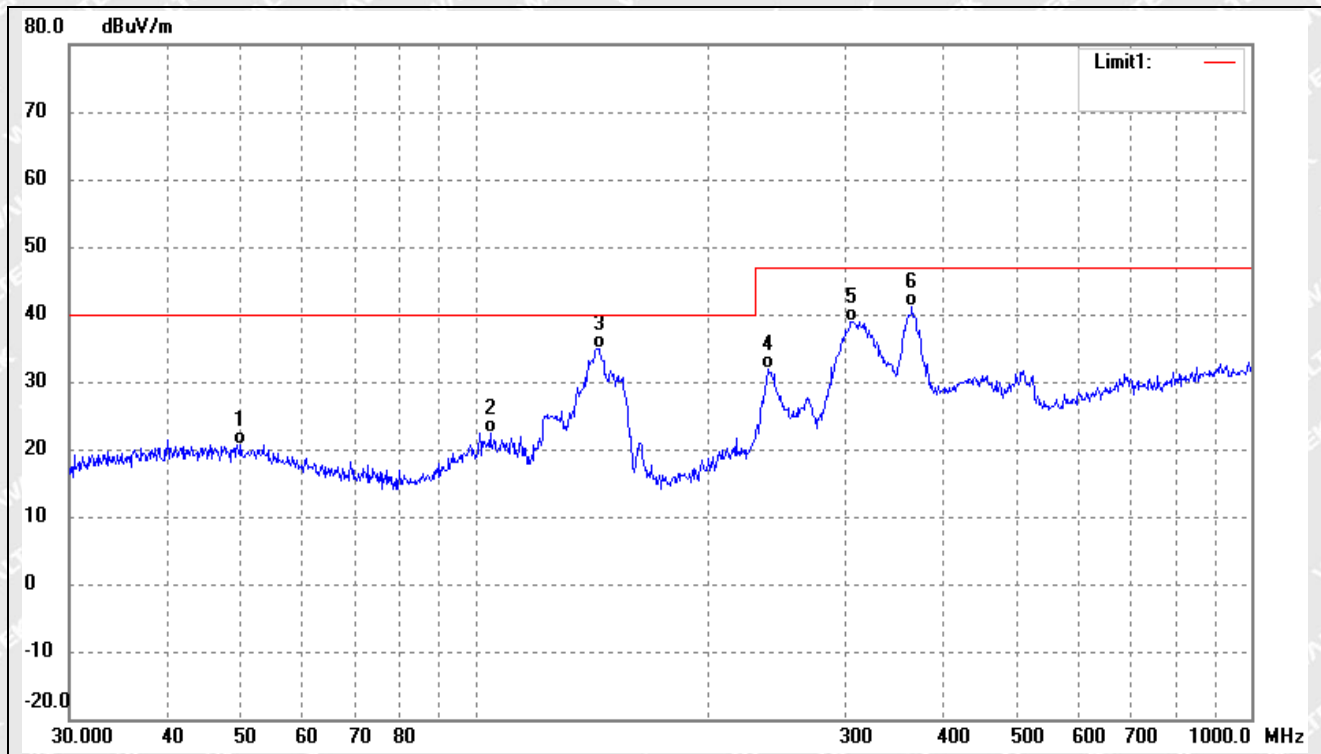
Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.0251	33.24	-7.67	25.57	40.00	-14.43	-	-	QP
2	97.4560	34.95	-8.77	26.18	40.00	-13.82	-	-	QP
3	157.5588	41.39	-11.28	30.11	40.00	-9.89	-	-	QP
4	271.3246	36.45	-5.98	30.47	47.00	-16.53	-	-	QP
5	360.4476	32.33	-3.97	28.36	47.00	-18.64	-	-	QP
6	515.4374	31.52	-1.86	29.66	47.00	-17.34	-	-	QP



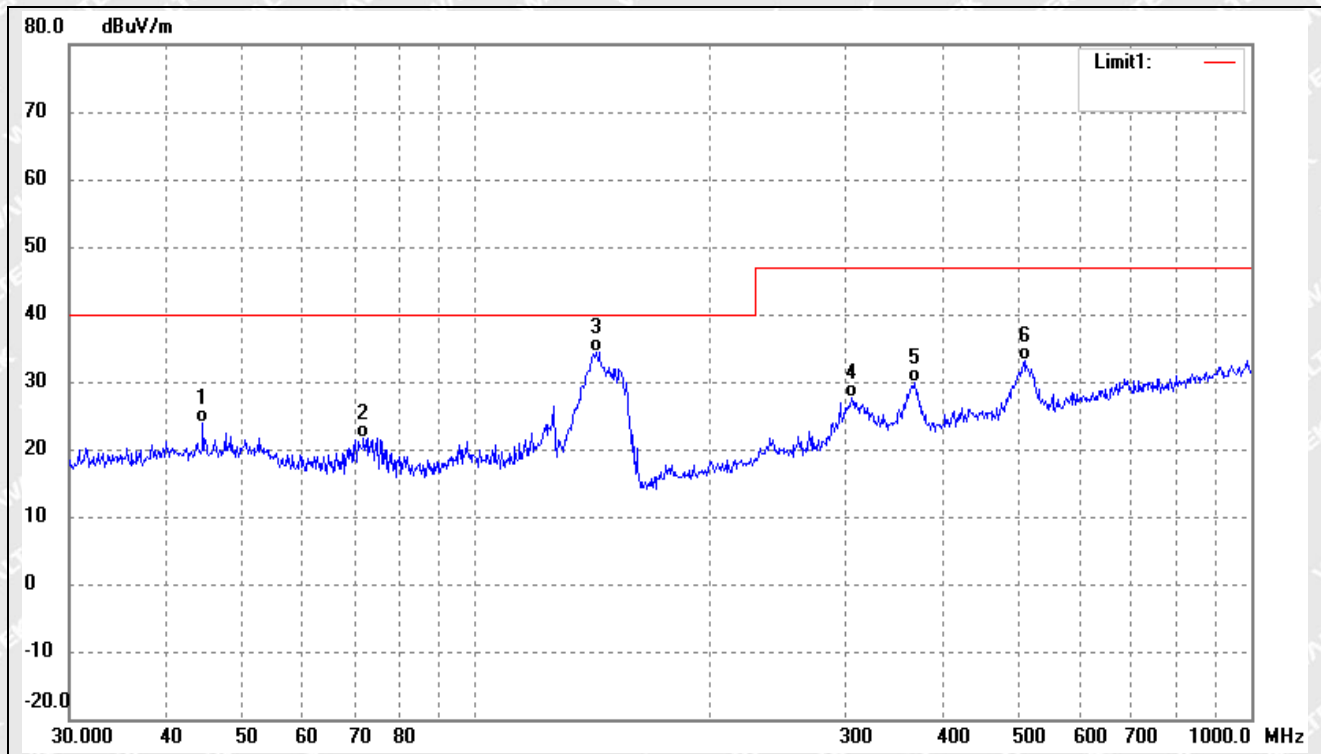
Test mode:	TM2	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.8814	27.93	-7.32	20.61	40.00	-19.39	-	-	QP
2	104.5361	30.59	-8.10	22.49	40.00	-17.51	-	-	QP
3	144.3348	46.50	-11.51	34.99	40.00	-5.01	-	-	QP
4	238.3102	38.97	-7.11	31.86	47.00	-15.14	-	-	QP
5	305.6800	43.86	-4.92	38.94	47.00	-8.06	-	-	QP
6	365.5391	44.96	-3.88	41.08	47.00	-5.92	-	-	QP



Test mode:	TM2	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.5867	31.16	-7.22	23.94	40.00	-16.06	-	-	QP
2	71.8319	32.82	-11.24	21.58	40.00	-18.42	-	-	QP
3	143.3260	45.96	-11.47	34.49	40.00	-5.51	-	-	QP
4	305.6800	32.60	-4.92	27.68	47.00	-19.32	-	-	QP
5	368.1116	33.64	-3.84	29.80	47.00	-17.20	-	-	QP
6	511.8351	35.07	-1.94	33.13	47.00	-13.87	-	-	QP

Remark: '-' Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

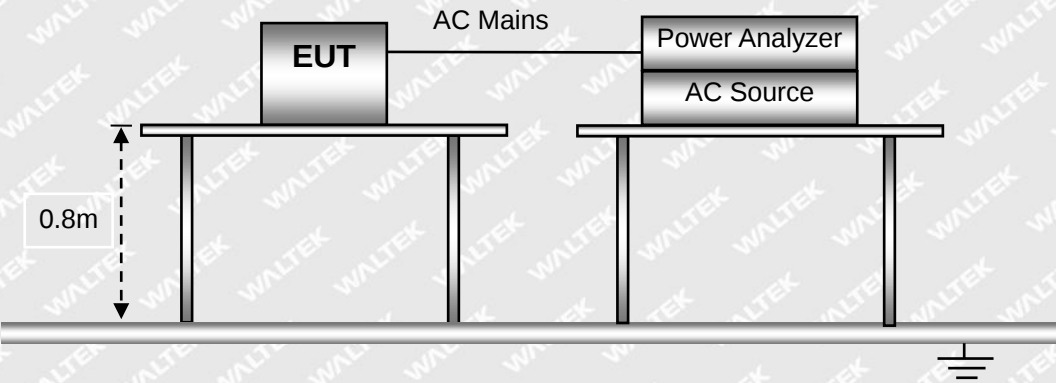


5. Harmonic Current Emissions

5.1 Test Procedure

Test is conducting under the description of EN 61000-3-2.

5.2 Test Setup Block Diagram



5.3 Test Standards

EN61000-3-2, Clause 7.1 Limits for Class A equipment.

5.4 Environmental Conditions

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

5.5 Harmonic Current Emissions Test Data



Harmonics – Class-A

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/3/3

Start time: 15:55:35

End time: 15:58:16

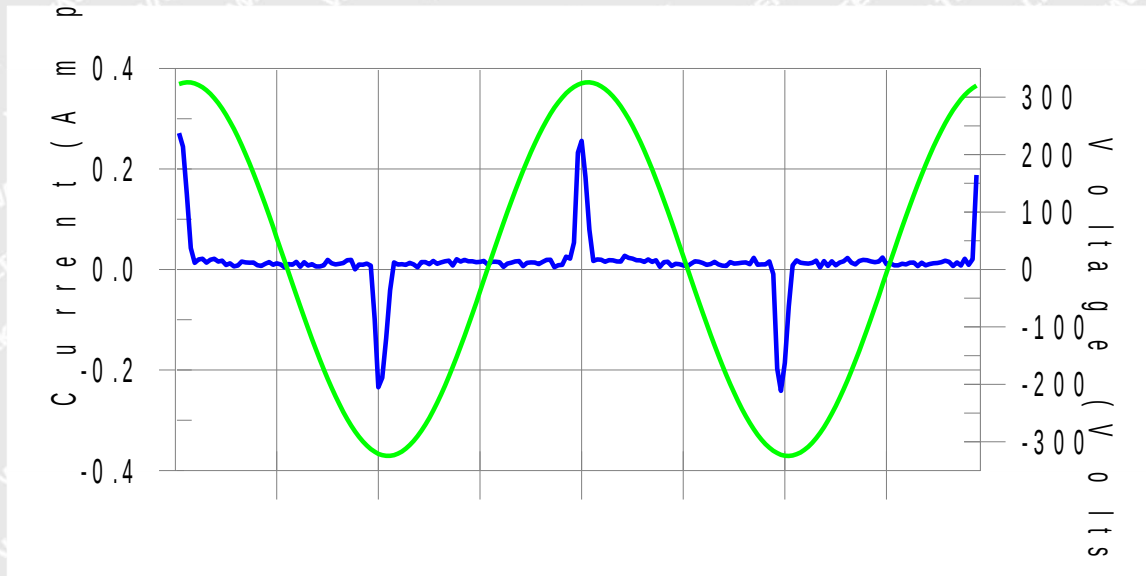
Test duration (min): 2.5

Data file name: H-000429.cts_data

Test Result: Pass

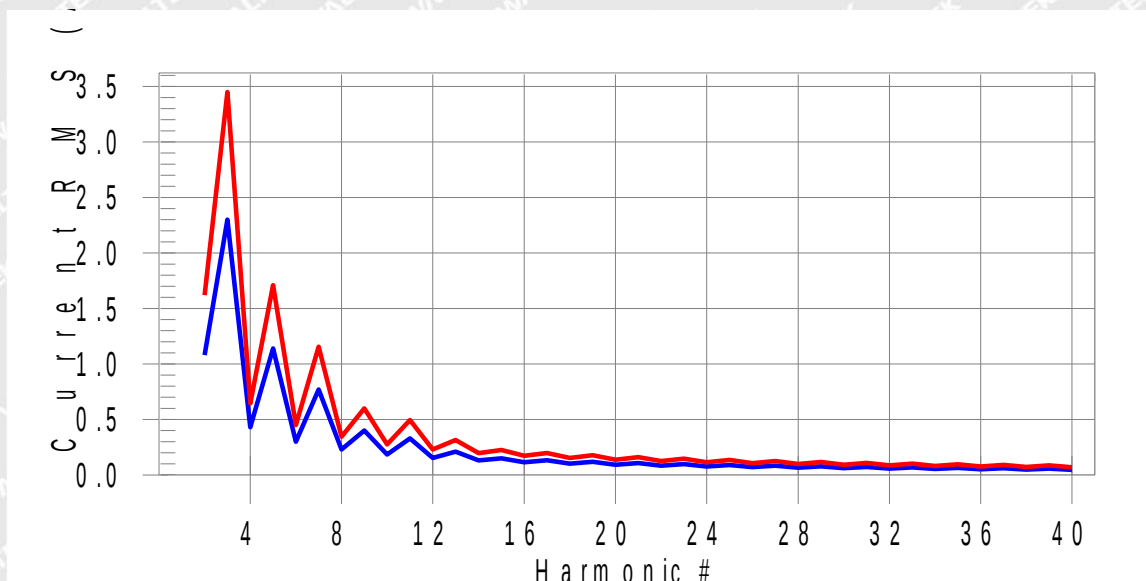
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits

**Test result: Pass** **Worst harmonics H15-5.3% of 150% limit, H15-7.2% of 100% limit**



Current Test Result Summary (Run time)

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/3/3

Start time: 15:55:35

End time: 15:58:16

Test duration (min): 2.5

Data file name: H-000429.cts_data

Test Result: Pass

Source qualification: Normal

THC(A): 0.041

I-THD(%): 198.3

POHC(A): 0.011

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.08

Frequency(Hz): 50.00

I_Peak (Amps): 0.284

I_RMS (Amps): 0.054

I_Fund (Amps): 0.020

Crest Factor: 5.505

Power (Watts): 4.7

Power Factor: 0.398

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	0.016	2.300	0.7	0.019	3.450	0.6	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.016	1.140	1.4	0.018	1.710	1.1	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.015	0.770	1.9	0.017	1.155	1.5	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.014	0.400	3.5	0.016	0.600	2.7	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.013	0.330	4.0	0.015	0.495	3.0	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.012	0.210	5.7	0.013	0.315	4.3	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.011	0.150	7.2	0.012	0.225	5.3	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.009	0.132	7.2	0.010	0.198	5.2	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.008	0.118	6.9	0.009	0.178	4.9	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.007	0.107	6.4	0.007	0.161	4.5	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.006	0.098	5.8	0.006	0.147	4.0	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.005	0.090	N/A	0.005	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.003	0.083	N/A	0.004	0.125	N/A	Pass



Reference No.: WTF22X12245071W003

28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.003	0.078	N/A	0.003	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.002	0.073	N/A	0.002	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	0.002	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

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**Voltage Source Verification Data (Run time)**

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/3/3

Start time: 15:55:35

End time: 15:58:16

Test duration (min): 2.5

Data file name: H-000429.cts_data

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.08

Frequency(Hz): 50.00

I_Peak (Amps): 0.284

I_RMS (Amps): 0.054

I_Fund (Amps): 0.020

Crest Factor: 5.505

Power (Watts): 4.7

Power Factor: 0.398

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.060	0.460	13.04	OK
3	0.501	2.070	24.22	OK
4	0.080	0.460	17.40	OK
5	0.055	0.920	6.02	OK
6	0.034	0.460	7.49	OK
7	0.018	0.690	2.54	OK
8	0.020	0.460	4.35	OK
9	0.013	0.460	2.82	OK
10	0.009	0.460	1.92	OK
11	0.014	0.230	6.03	OK
12	0.010	0.230	4.39	OK
13	0.015	0.230	6.51	OK
14	0.005	0.230	2.31	OK
15	0.011	0.230	4.91	OK
16	0.009	0.230	3.88	OK
17	0.012	0.230	5.10	OK
18	0.011	0.230	4.67	OK
19	0.016	0.230	6.90	OK
20	0.015	0.230	6.35	OK
21	0.013	0.230	5.78	OK
22	0.003	0.230	1.26	OK
23	0.009	0.230	4.12	OK
24	0.004	0.230	1.79	OK
25	0.008	0.230	3.30	OK
26	0.003	0.230	1.41	OK
27	0.006	0.230	2.77	OK
28	0.005	0.230	2.12	OK



Reference No.: WTF22X12245071W003

29	0.009	0.230	3.98	OK
30	0.004	0.230	1.55	OK
31	0.007	0.230	3.22	OK
32	0.003	0.230	1.50	OK
33	0.007	0.230	2.95	OK
34	0.003	0.230	1.16	OK
35	0.004	0.230	1.76	OK
36	0.003	0.230	1.38	OK
37	0.004	0.230	1.84	OK
38	0.003	0.230	1.15	OK
39	0.004	0.230	1.94	OK
40	0.008	0.230	3.53	OK

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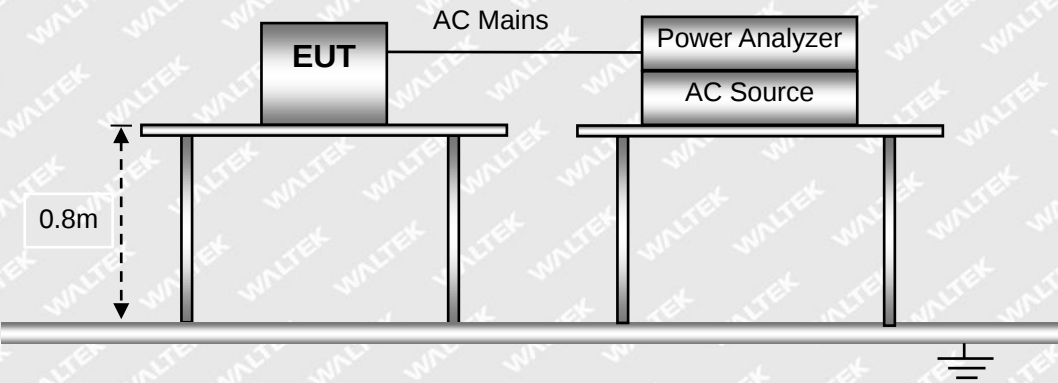


6. Voltage Fluctuation and Flicker

6.1 Test Procedure

Test is conducting under the description of EN 61000-3-3.

6.2 Test Setup Block Diagram



6.3 Test Standards

EN61000-3-3, Limit: Clause 5.

6.4 Environmental Conditions

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

6.5 Voltage Fluctuation and Flicker Test Data

Result: The EUT is compliance with the requirements of this section.

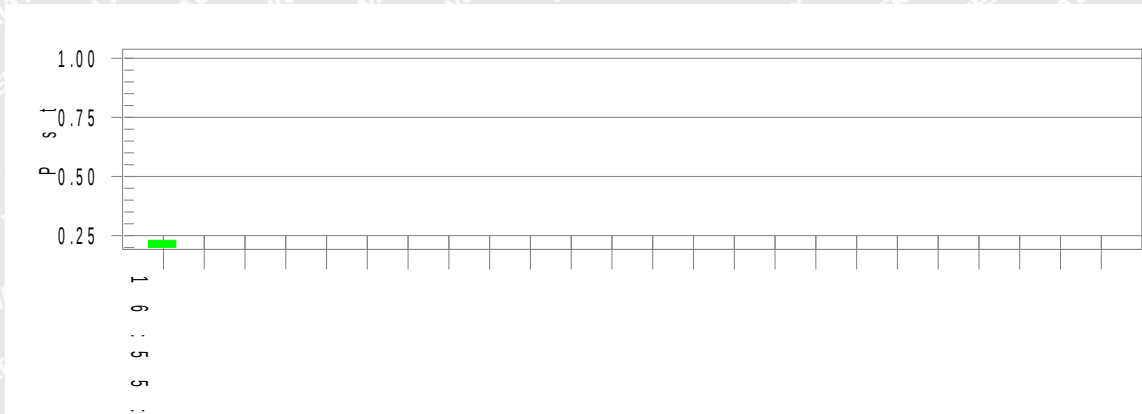


Test mode:

TM1

Test Result: Pass

Status: Test Completed

Pst and limit lineEuropean LimitsPlt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.99

Highest dt (%):

Test limit (%):

T-max (mS): 0

Test limit (mS): 500.0 Pass

Highest dc (%): 0.00

Test limit (%): 3.30 Pass

Highest dmax (%): 0.00

Test limit (%): 4.00 Pass

Highest Pst (10 min. period): 0.230 Test limit: 1.000 Pass

Highest Plt (2 hr. period): 0.101 Test limit: 0.650 Pass

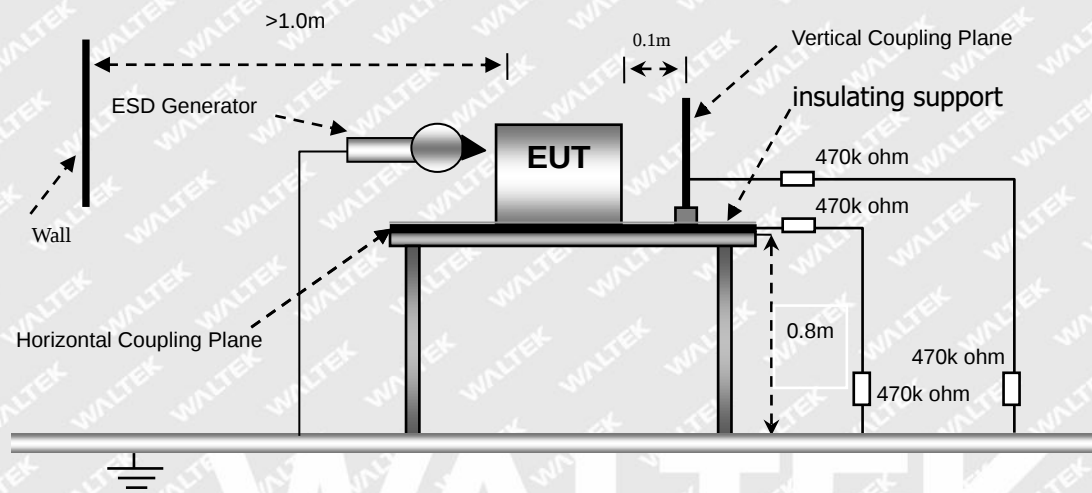


7. Electrostatic Discharge (ESD)

7.1 Test Procedure

Test is conducting under the description of EN 61000-4-2.

7.2 Test Setup Block Diagram



7.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	B
Note: TM3 for TT,TR		

7.4 Environmental Conditions

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

7.5 Electrostatic Discharge Immunity Test Data



Test mode	TM1-TM3							
EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
USB Port	A	A	A	A	A	A	B	B
Button	A	A	A	A	A	A	B	B
Enclosure	A	A	A	A	A	A	B	B
Direct Contact Discharge								
USB Port	A	A	A	A	/	/	/	/
Enclosure	A	A	A	A	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

Test Result: Pass

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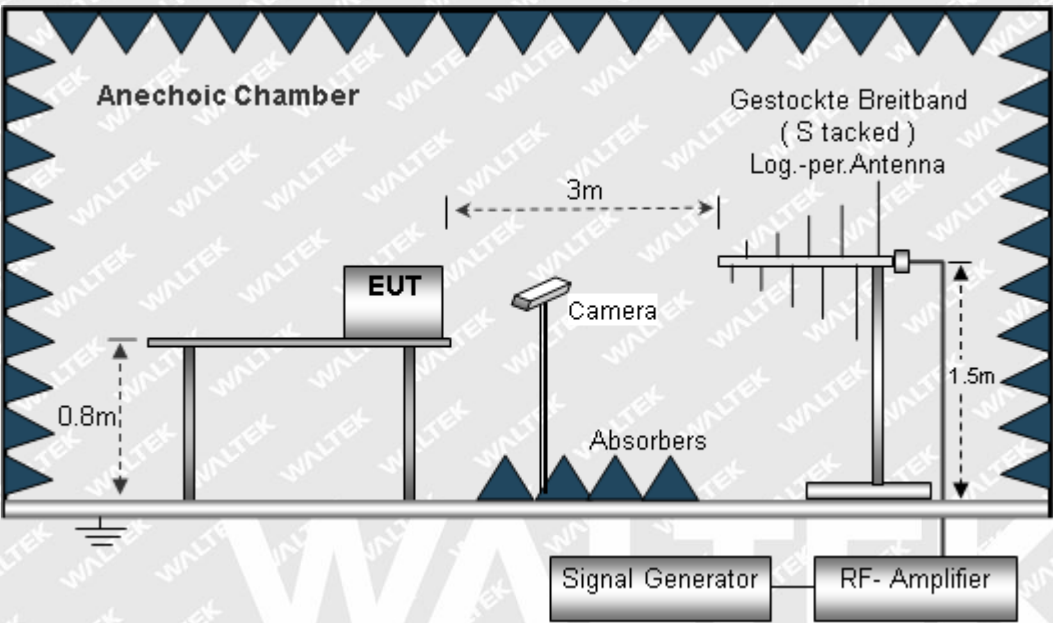


8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Procedure

Test is conducting under the description of EN 61000-4-3.

8.2 Test Setup Block Diagram



8.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	A
Note: TM3 for CT,CR		

8.4 Environmental Conditions

Temperature:	25°C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

8.5 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth



Test mode		TM1-TM3							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test Result: Pass

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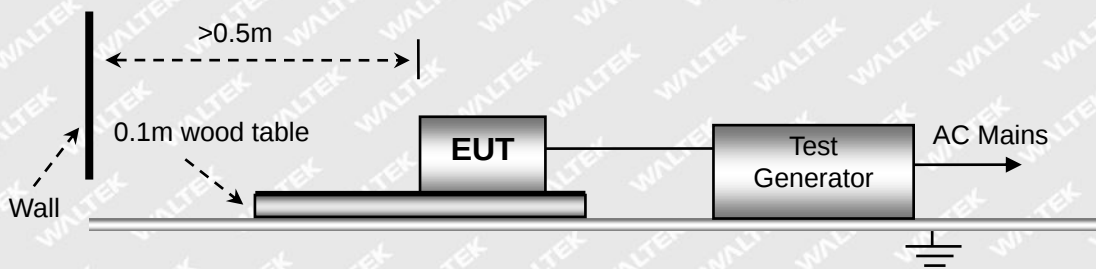
9. Fast Transients, Common Mode (EFT)

9.1 Test Procedure

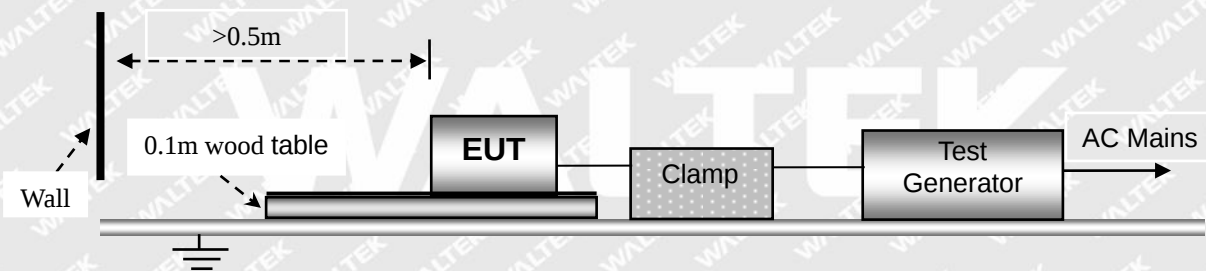
Test is conducting under the description of EN 61000-4-4.

9.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



9.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	
Note: TM3 for TT,TR		

9.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

9.5 Electrical Fast Transients Test Data



Test Mode		TM1-TM3							
EN 61000-4-4 Test Line		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Main Power port	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	A	A	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/

Test Result: Pass

WALTEK



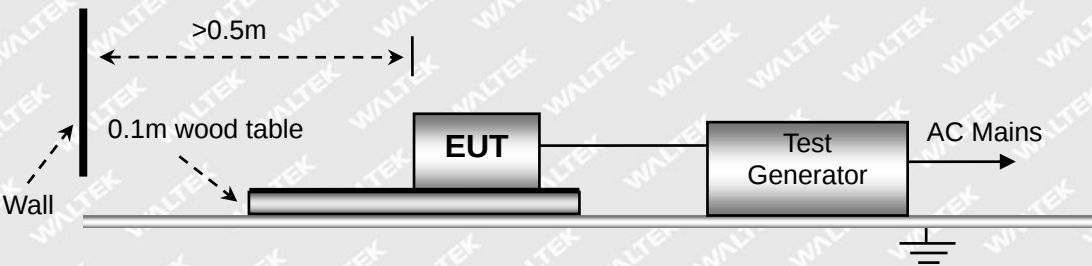
10. Surges

10.1 Test Procedure

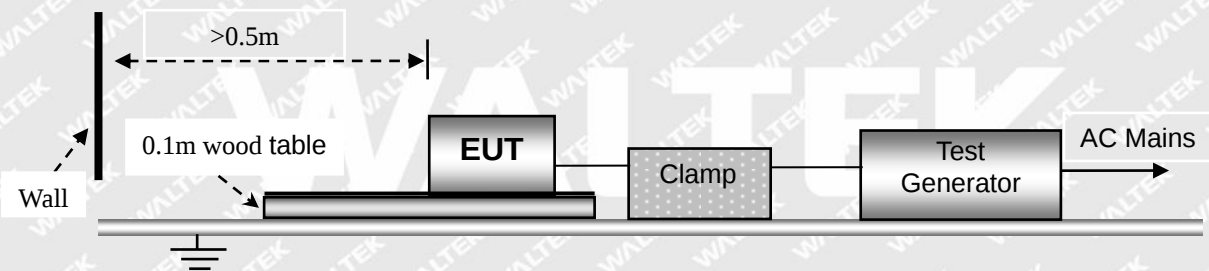
Test is conducting under the description of EN 61000-4-5.

10.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



10.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	
Note: TM3 for TT,TR		

10.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

10.5 Surge Test Data



Test Mode	TM1-TM3			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	A	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass

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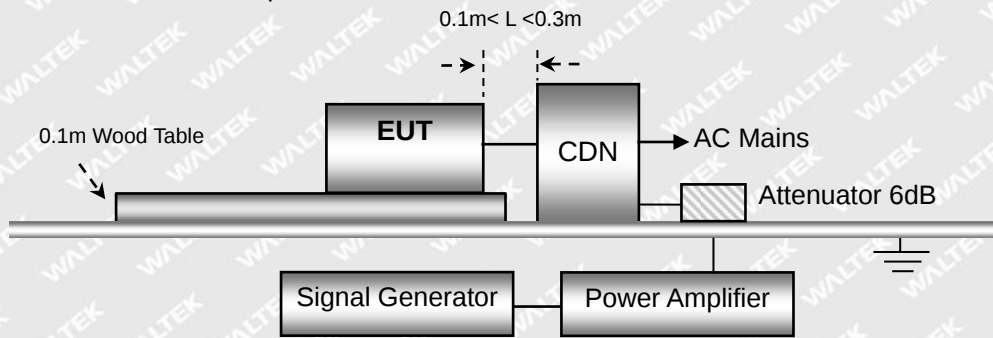
11. Radio Frequency, Common Mode (C/S)

11.1 Test Procedure

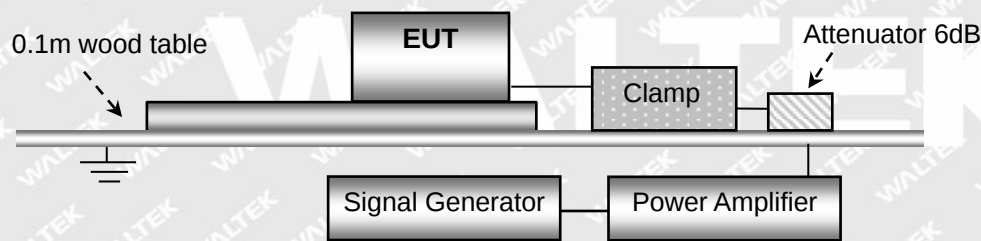
Test is conducting under the description of EN 61000-4-6.

11.2 Test Setup Block Diagram

For AC Mains or DC Input:



For Signal or Telecommunication Ports:



11.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	A
Note: TM3 for CT,CR		

11.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

11.5 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second



Test Mode		TM1-TM3		
Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Result: Pass

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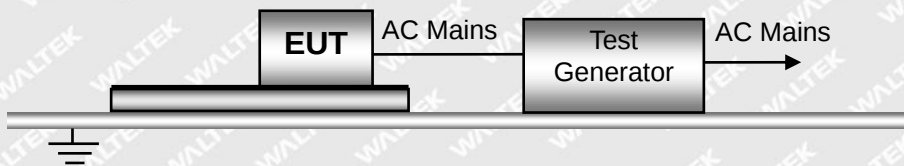


12. Voltage Dips and Interruptions

12.1 Test Procedure

Test is conducting under the description of EN 61000-4-11.

12.2 Test Setup Block Diagram



12.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM3	B for voltage dip/ C for voltage interruption
Note: TM3 for TT,TR		

12.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

12.5 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U_T (U_T is rated voltage for the EUT)

T: Test duration

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	B	/

Test Result: Pass



EXHIBIT 1 - EUT PHOTOGRAPHS

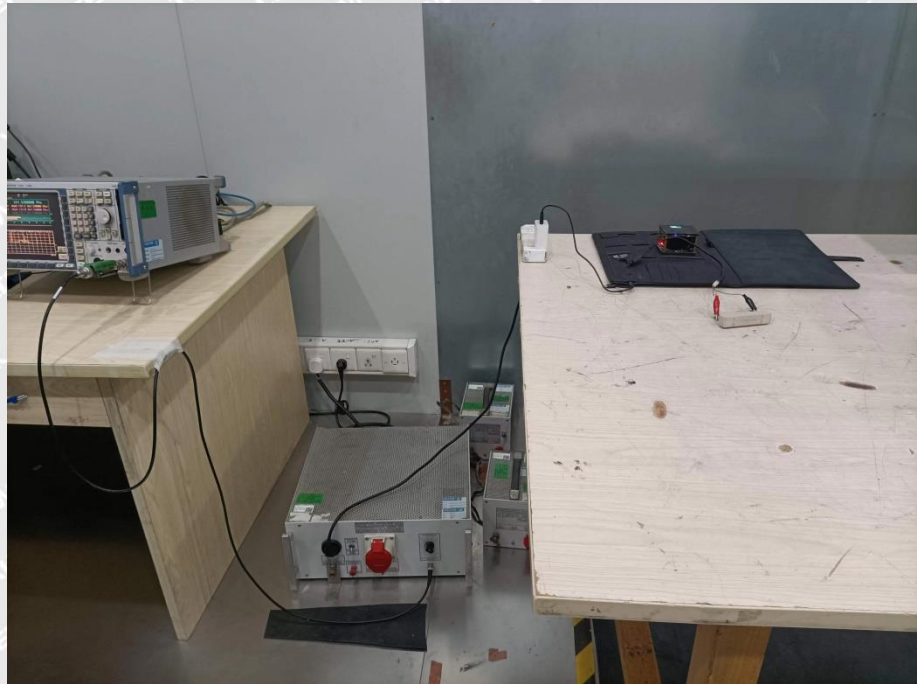
Please refer to “ANNEX”.

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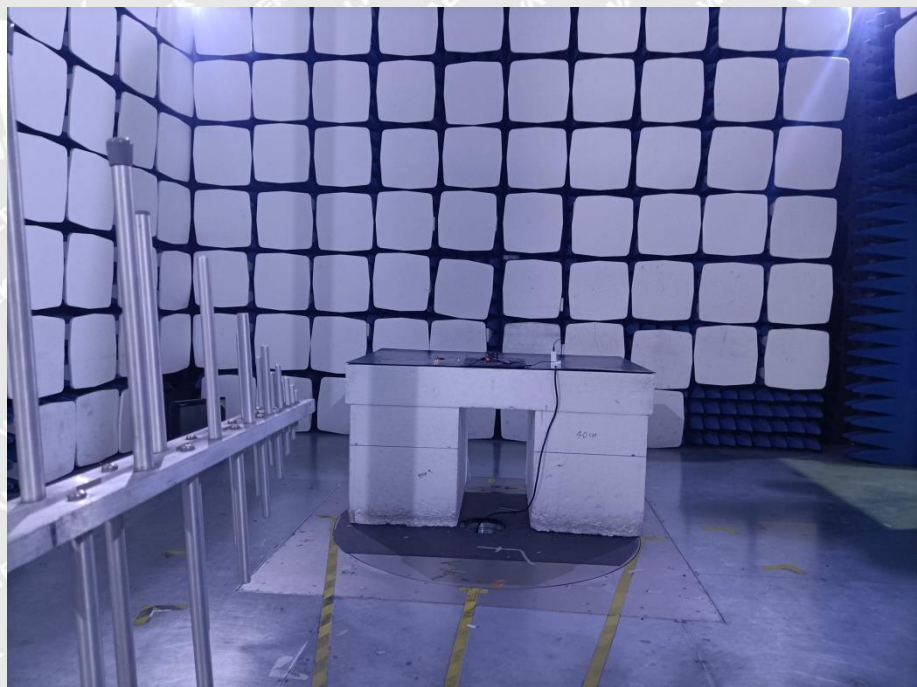


EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

**Conducted Emission
Test Setup**



**Radiation Emission
Test View(30MHz to
1GHz)**





Harmonic/Flicker Test
View

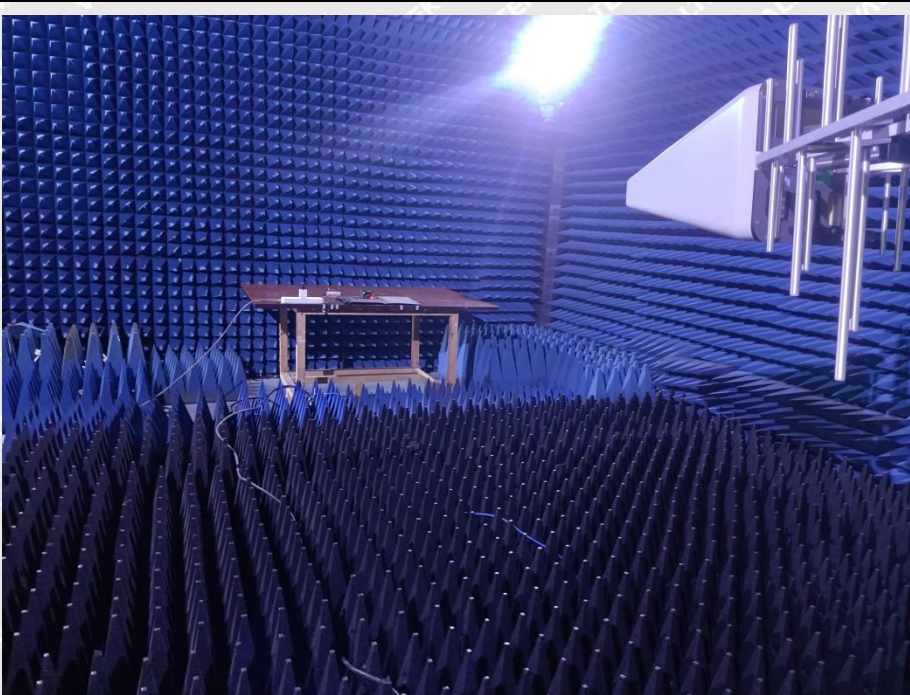


EN 61000-4-2 Test View

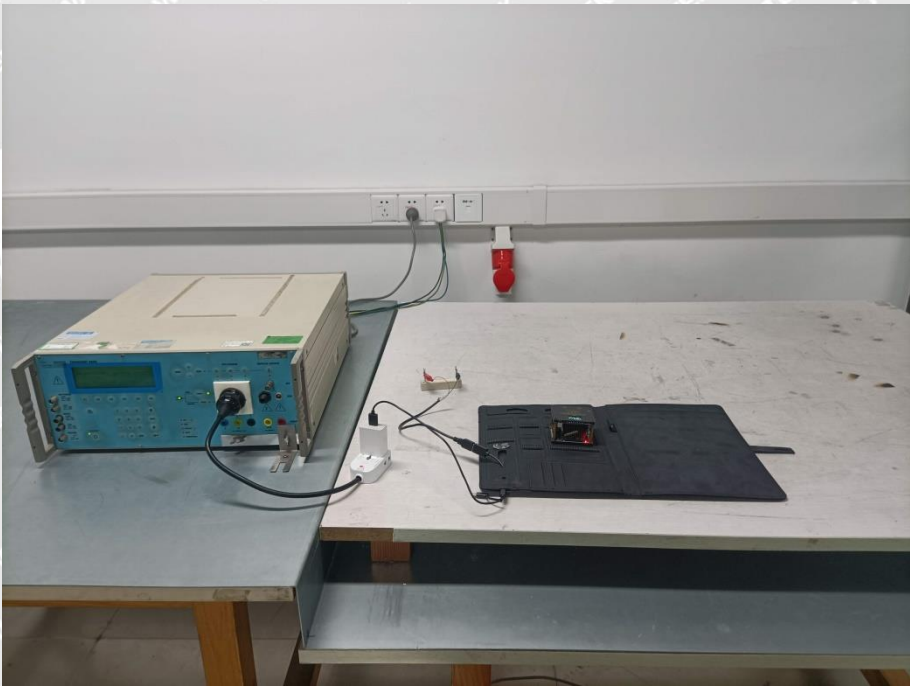




EN 61000-4-3 Test View



EN 61000-4-4/5/11 Test
View





EN 61000-4-6 Test View



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

WALTEK

EMC Test Report

Report No.: AGC05443220533EE02

PRODUCT DESIGNATION : A4 portfolio with wireless charger and power bank

BRAND NAME : N/A

MODEL NAME : MO9401

APPLICANT : MID OCEAN BRANDS B.V

DATE OF ISSUE : Jun. 01, 2022

STANDARD(S) : EN 55032: 2015/A11:2020
EN IEC 61000-3-2:2019
EN61000-3-3:2013/A1:2019
EN 55035:2017/A11:2020

REPORT VERSION : V1.0



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Attestation of Global Compliance(Shenzhen)Co., Ltd

Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>



Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 01, 2022	Valid	Initial Release

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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>

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1. VERIFICATION OF CONFORMITY

Applicant	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Product Designation	A4 portfolio with wireless charger and power bank
Brand Name	N/A
Test Model	MO9401
Date of test	May 20, 2022 to Jun. 01, 2022
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-EC-IT/AC(2013-03-01)

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements of Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment.

The test results of this report relate only to the tested sample identified in this report.

Prepared By



Eder Zhan
(Project Engineer)

Jun. 01, 2022

Reviewed By



Calvin Liu
(Reviewer)

Jun. 01, 2022

Approved By



Max Zhang
(Authorized Officer)

Jun. 01, 2022

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2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	EMI TEST MODE DESCRIPTION	WORST
1	Charging mode with adapter	V
NO.	EMS TEST MODE DESCRIPTION	WORST
1	Charging mode with adapter	V
Note: 1. V means EMI worst mode 2. All modes have been tested and only the worst mode test data recorded in the test report.		

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Conducted Emission, $U_c = \pm 3.1 \text{ dB}$
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 4.0 \text{ dB}$
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8 \text{ dB}$

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4. PRODUCT INFORMATION

Housing Type	Plastic and metal
Power Supply	Input: 5V/1A Output: 5V/1A
Wireless Charging Output Power	5W
Hardware Version	V1.0
Software Version	V1.0

I/O Port Information (☒ Applicable ☐ Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
DC IN	1	--	1
USB Port	1	--	1

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Power Cable
Wireless Load	--	RX24-50W	--
Adapter	Zhongli	ZL-PCB0100020502000	--

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6. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Calibration Date	Calibration Due.
Test Receiver	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022

TEST EQUIPMENT OF POWER HARMONICS / VOLTAGE FLUCTUATION / FLICKER TEST

Equipment	Manufacturer	Model	S/N	Calibration Date	Calibration Due.
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Jul. 15, 2020	Jul. 14, 2022
AC Source	Schaffner	NSG 1007	56825	Jul. 15, 2020	Jul. 14, 2022

TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Calibration Date	Calibration Due.
ESD Simulator	EM Test	NSG 438	782	Jan. 03, 2022	Jan. 02, 2023

TEST EQUIPMENT OF SURGE/EFT/DIPSTEST

Equipment	Manufacturer	Model	S/N	Calibration Date	Calibration Due.
EFT Surge Generator	Schaffner	Modula 6150	34437	Jul. 19, 2021	Jul. 18, 2022

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TEST EQUIPMENT OF RS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Jun. 08, 2020	Jun. 07, 2022
POWER SENSOR	R&S	URV5-Z4	100124	Apr. 26, 2021	Apr. 25, 2023
POWER METER	R&S	NRVD	8323781027	Apr. 26, 2021	Apr. 25, 2023
POWER AMPLIFIER	KALMUS	7100LC	04-02/17-06-001	N/A	N/A
RF AMPLIFIER	Milmega	AS0104-55_55	1004793	N/A	N/A
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08,2021	Jan. 07,2023

TEST EQUIPMENT OF CS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Amplifier	AR	75A250	18464	N/A	N/A
CDN	ZHINAN	ZN3751	15004	Sep. 03, 2020	Sep. 02, 2022
6dB attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Electromagnetic Injection Clamp	Luthi	EM101	35773	Aug. 25,2020	Aug. 24,2022
Power Sensor	R&S	URV5-Z4	100124	Apr. 26, 2021	Apr. 25, 2023
Power Meter	R&S	NRVD	8323781027	Apr. 26, 2021	Apr. 25, 2023
SIGNAL GENERATOR	R&S	E4421B	MY43351603	Jun. 08, 2020	Jun. 07, 2022

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7. EN 55032 LINE CONDUCTED EMISSION TEST

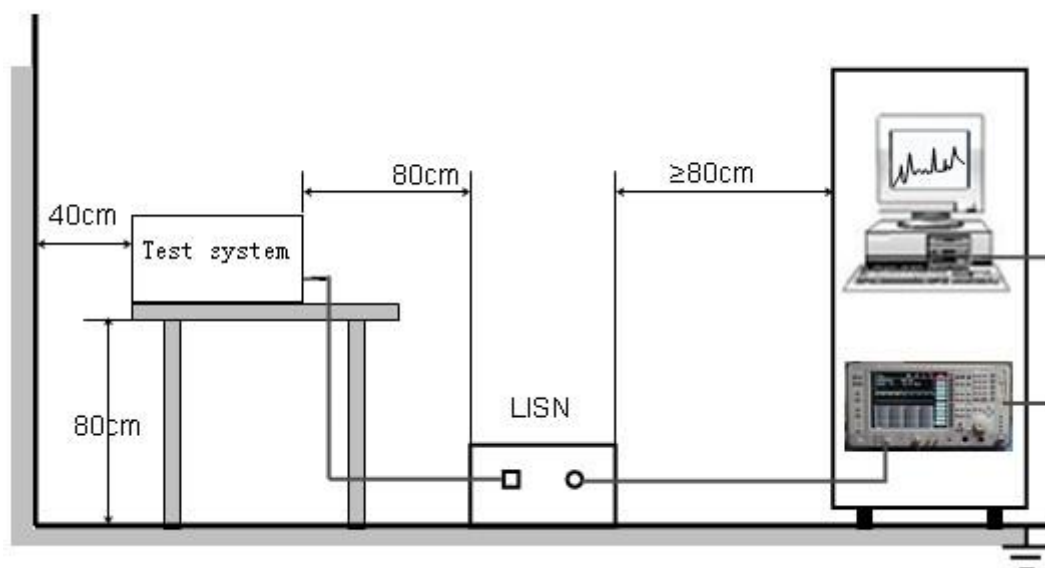
7.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



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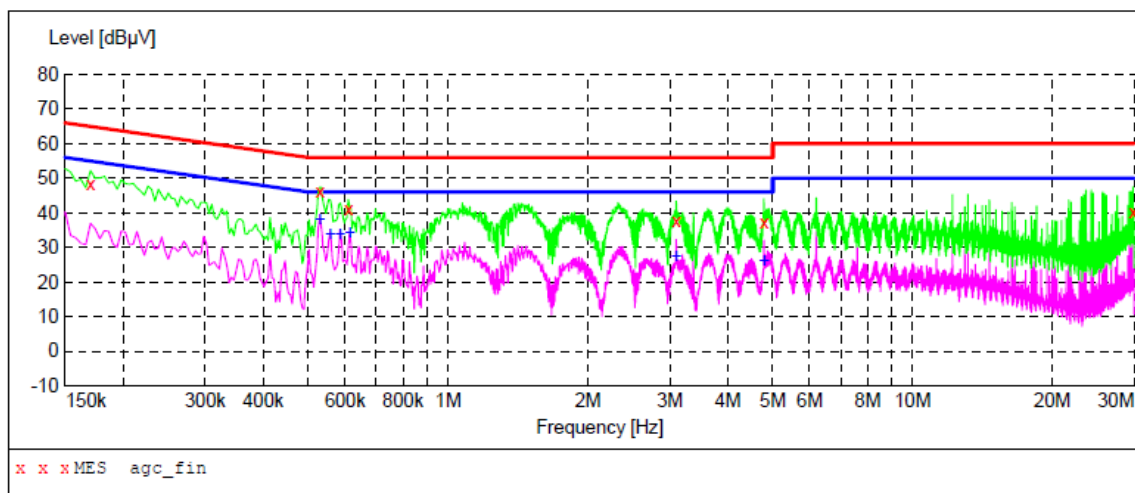
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7.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN55032.
- (4) The EUT received charging voltage by adapter through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- (5) All support equipments received power from a second LISN supplying power of AC 230V/50Hz, if any.
- (6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- (7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
- (8) During the above scans, the emissions were maximized by cable manipulation.
- (9) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- (10) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

7.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L1



MEASUREMENT RESULT: "agc_fin"

2022/5/26 9:01

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.170000	48.50	6.8	65	16.5	QP	L1
0.530000	46.20	5.4	56	9.8	QP	L1
0.610000	41.10	5.4	56	14.9	QP	L1
3.098000	37.60	6.5	56	18.4	QP	L1
4.786000	37.30	6.6	56	18.7	QP	L1
29.802000	40.30	9.6	60	19.7	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2022/5/26 9:00

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.530000	38.30	5.4	46	7.7	AV	L1
0.558000	34.00	5.4	46	12.0	AV	L1
0.586000	33.90	5.4	46	12.1	AV	L1
0.614000	34.10	5.4	46	11.9	AV	L1
3.098000	27.50	6.5	46	18.5	AV	L1
4.790000	26.10	6.6	46	19.9	AV	L1

RESULT: PASS

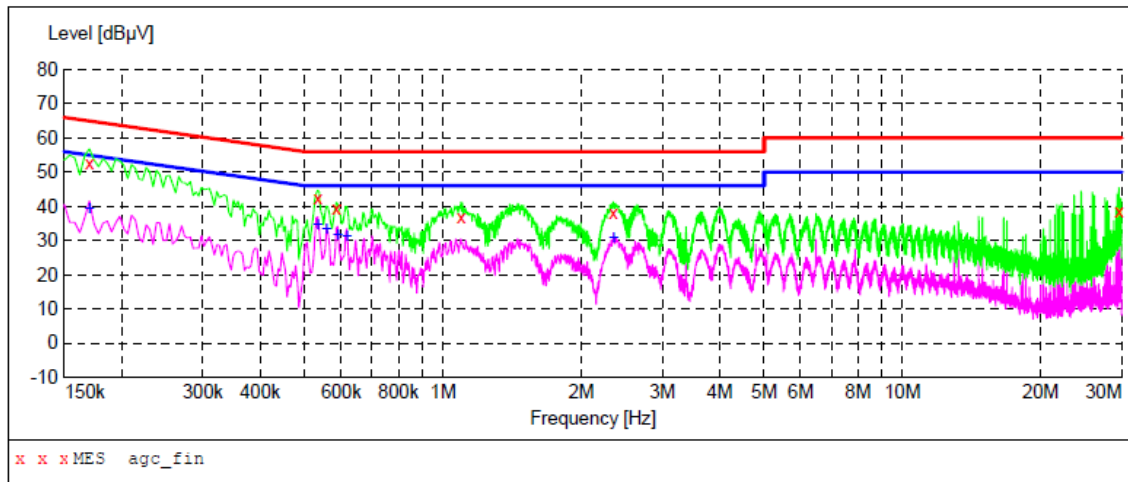
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LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT: "agc_fin"

2022/5/26 8:57

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.170000	52.40	6.8	65	12.6	QP	N
0.534000	42.30	5.4	56	13.7	QP	N
0.586000	39.40	5.4	56	16.6	QP	N
1.094000	37.00	5.6	56	19.0	QP	N
2.346000	38.30	6.5	56	17.7	QP	N
29.586000	38.60	9.5	60	21.4	QP	N

MEASUREMENT RESULT: "agc_fin2"

2022/5/26 8:57

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.170000	39.50	6.8	55	15.5	AV	N
0.534000	34.70	5.4	46	11.3	AV	N
0.558000	33.40	5.4	46	12.6	AV	N
0.590000	31.60	5.4	46	14.4	AV	N
0.618000	31.30	5.4	46	14.7	AV	N
2.350000	31.00	6.5	46	15.0	AV	N

RESULT: PASS

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8. EN 55032 RADIATED EMISSION TEST

8.1. LIMITS OF RADIATED DISTURBANCES

AT 3M DISTANCES

For class B equipment

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40
230-1000	3	47

For FM receivers

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)	
		Fundamental	Harmonics
30-230	3	60	52
230-300	3		52
300-1000	3		56

Note: The lower limit shall apply at the transition frequency.

Limits for radiated disturbance above 1 GHz at a measurement distance of 3 m

Frequency range (MHz)	Limits (dBuV/m), Class B ITE	
	Peak	Average
1000-3000MHz	70	50
3000-6000MHz	74	54

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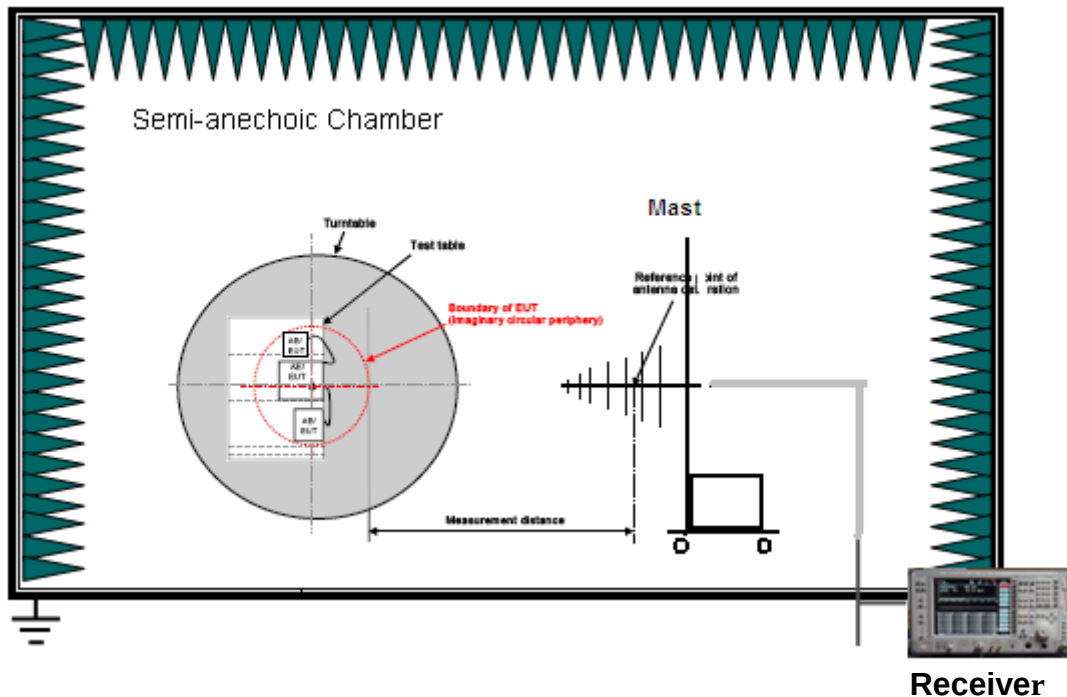
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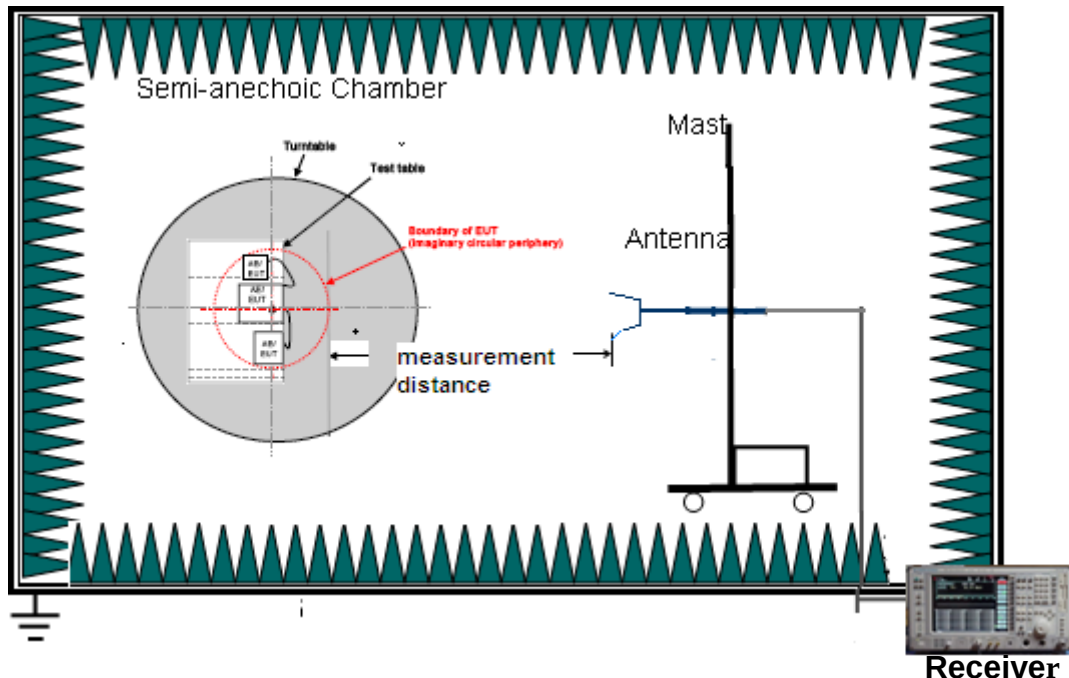
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8.2. BLOCK DIAGRAM OF TEST SETUP

Radiated Disturbance below 1 GHz



Radiated Disturbance above 1 GHz



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

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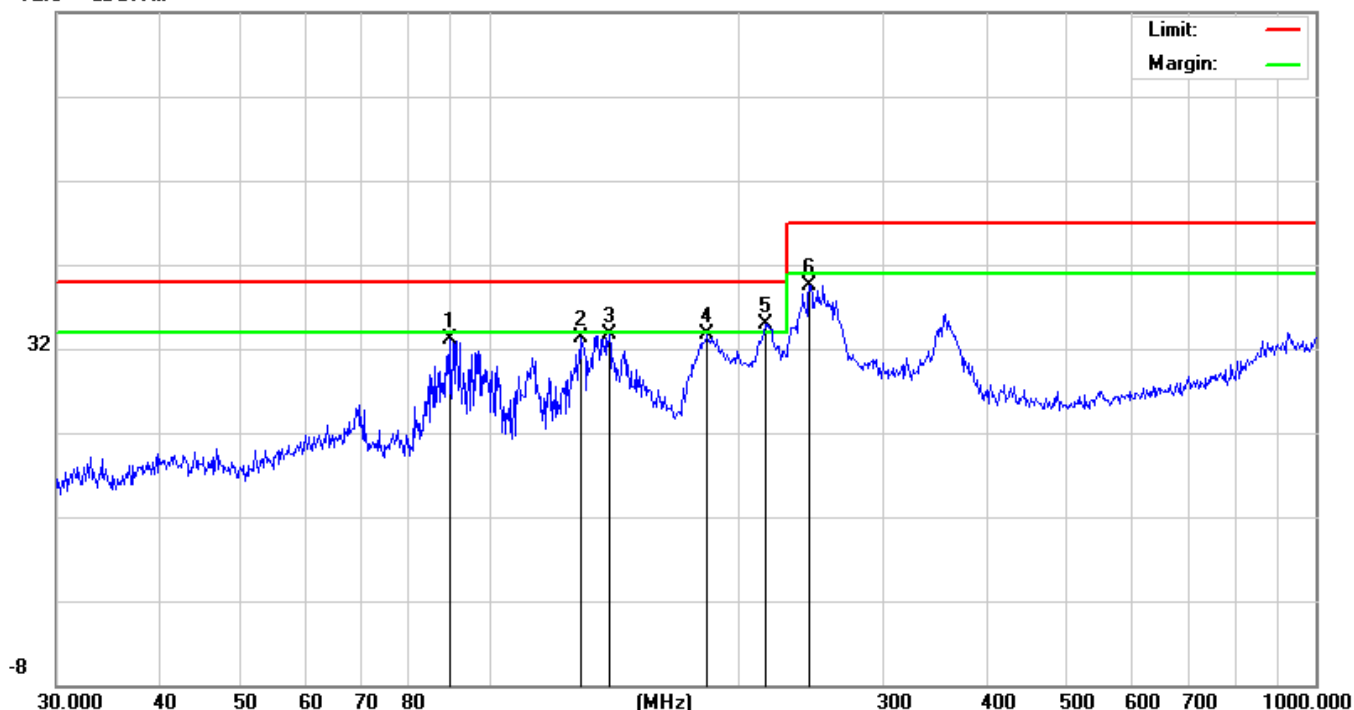
8.3. PROCEDURE OF RADIATED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55032 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN 55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN 55032.
- (4) The EUT received charging voltage by Adapter which got power through the outlet socket under the turntable. All support equipments received AC230V/50Hz power from socket under the turntable, if any.
- (5) The antenna was placed at 3 meter away from the EUT as stated in EN 55032. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz, 1GHz-6GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (7) The test mode(s) were scanned during the test:
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

8.4. TEST RESULT OF RADIATED EMISSION TEST

RADIATED EMISSION BELOW 1GHZ– HORIZONTAL

72.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		89.9047	18.07	14.96	33.03	40.00	-6.97	peak
2		129.4677	15.42	17.81	33.23	40.00	-6.77	peak
3		139.8507	16.13	17.64	33.77	40.00	-6.23	peak
4		183.8439	17.71	16.02	33.73	40.00	-6.27	peak
5	*	216.0240	18.63	16.20	34.83	40.00	-5.17	peak
6		244.2321	22.92	16.59	39.51	47.00	-7.49	peak

RESULT: PASS

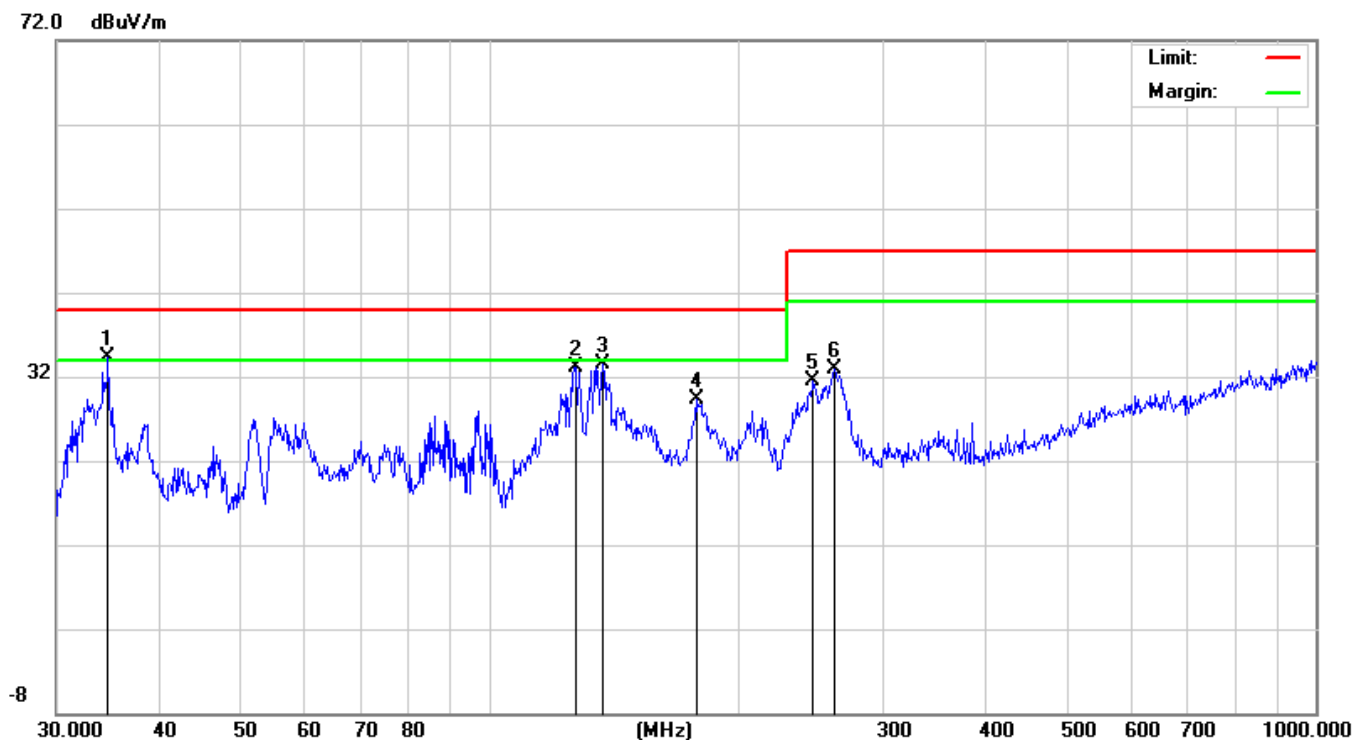
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RADIATED EMISSION BELOW 1GHZ- VERTICAL



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	34.6385	22.04	12.31	34.35	40.00	-5.65	peak
2		127.6645	15.08	18.07	33.15	40.00	-6.85	peak
3		137.4201	15.22	18.20	33.42	40.00	-6.58	peak
4		178.1325	12.25	17.04	29.29	40.00	-10.71	peak
5		246.8148	13.01	18.54	31.55	47.00	-15.45	peak
6		261.9753	14.35	18.47	32.82	47.00	-14.18	peak

RESULT: PASS

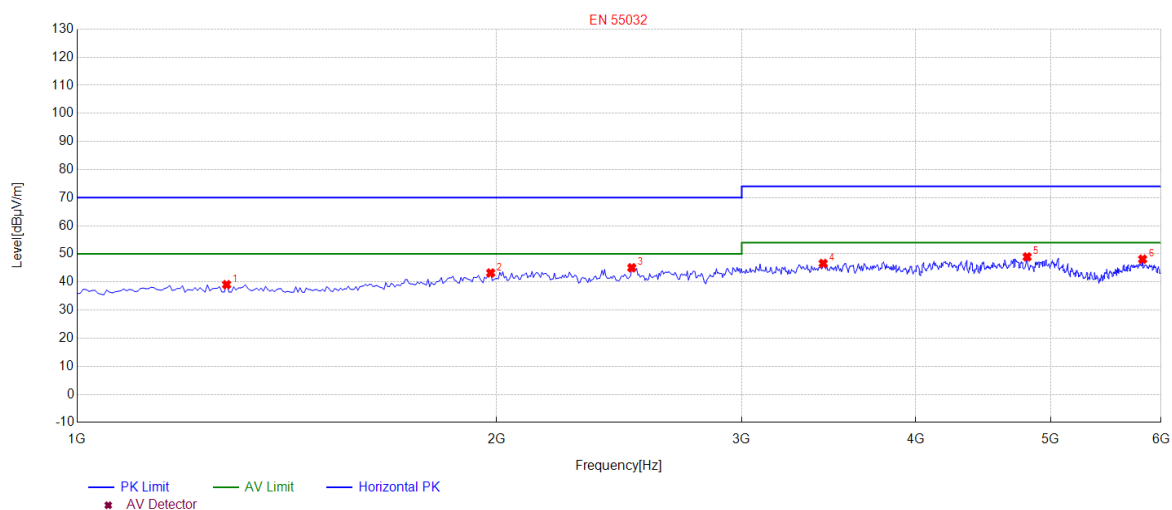
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RADIATED EMISSION ABOVE 1GHz – HORIZONTAL



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1280.2803	39.06	-16.91	70.00	30.94	100	330	Horizontal
2	1980.981	43.21	-12.02	70.00	26.79	100	150	Horizontal
3	2501.5015	45.05	-9.72	70.00	24.95	100	220	Horizontal
4	3432.4324	46.59	-7.83	74.00	27.41	100	310	Horizontal
5	4808.8088	48.92	-4.90	74.00	25.08	100	190	Horizontal
6	5819.8198	48.11	-4.26	74.00	25.89	100	140	Horizontal

RESULT: PASS

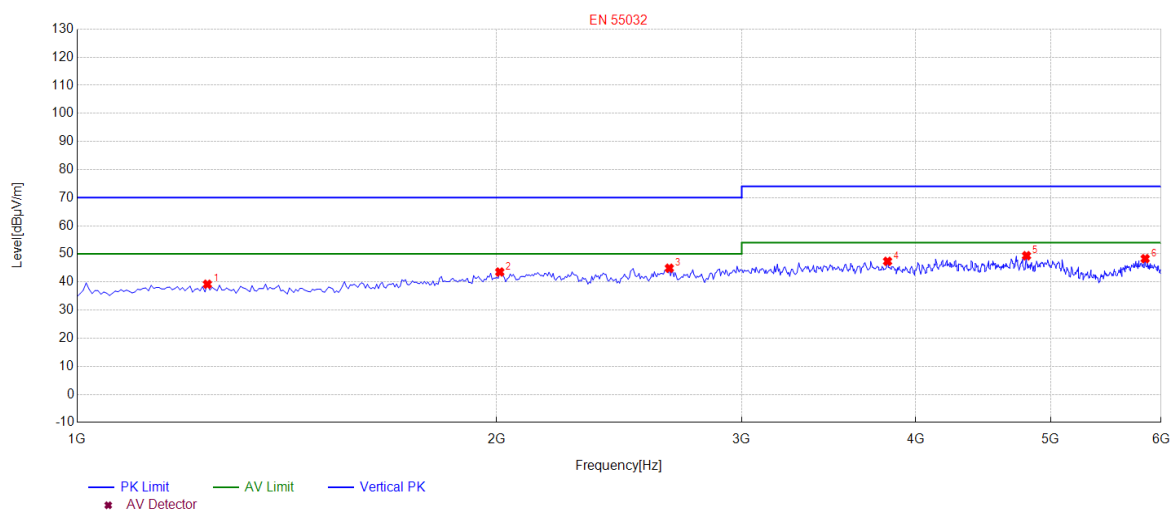
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RADIATED EMISSION ABOVE 1GHz - VERTICAL



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1240.2402	39.19	-16.88	70.00	30.81	100	150	Vertical
2	2011.011	43.54	-11.77	70.00	26.46	100	190	Vertical
3	2661.6617	44.90	-9.59	70.00	25.10	100	110	Vertical
4	3817.8178	47.35	-6.90	74.00	26.65	100	80	Vertical
5	4803.8038	49.34	-4.91	74.00	24.66	100	130	Vertical
6	5844.8448	48.29	-4.18	74.00	25.71	100	0	Vertical

RESULT: PASS

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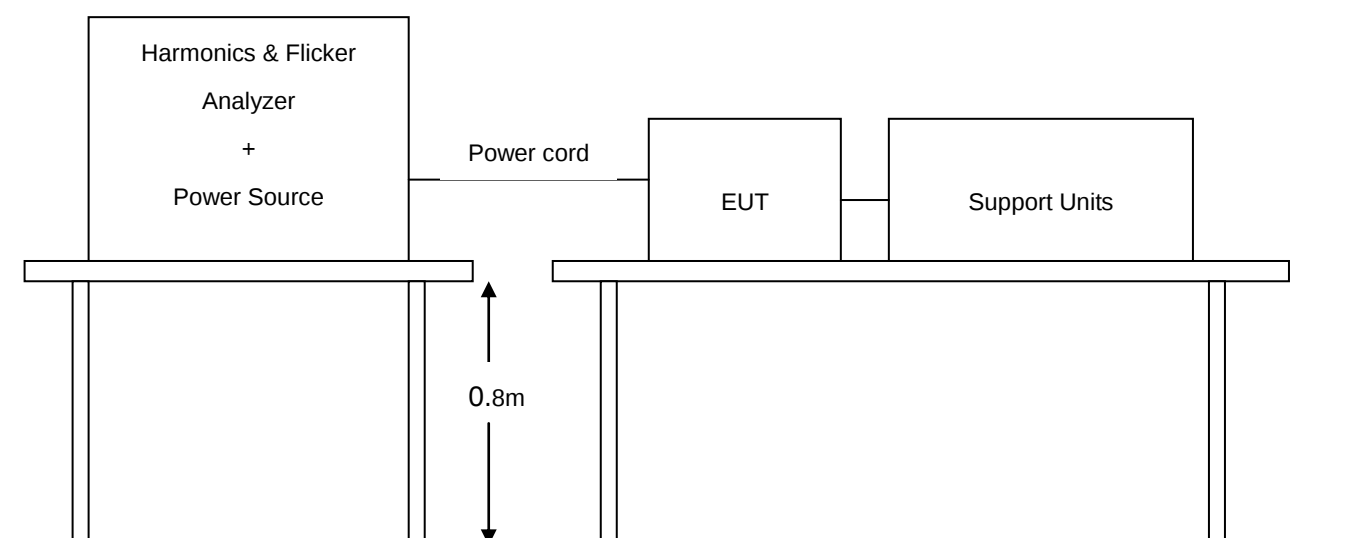
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9. POWER HARMONICS TEST

Port	AC mains
Basic Standard	EN 61000-3-2
Limits	☒ CLASS A ; ☐ CLASS B ; ☐ CLASS C ; ☐ CLASS D
Temperature	25°C
Humidity	55%

9.1. BLOCK DIAGRAM OF TEST SETUP



9.2. RESULT

Test Specification

Test Frequency:	50Hz	Test Voltage:	230V AC
Waveform:	Sine	Test Time:	2.5min
Classification:	Class A		

Note: 1.The active input power of the EUT is less than 75W.

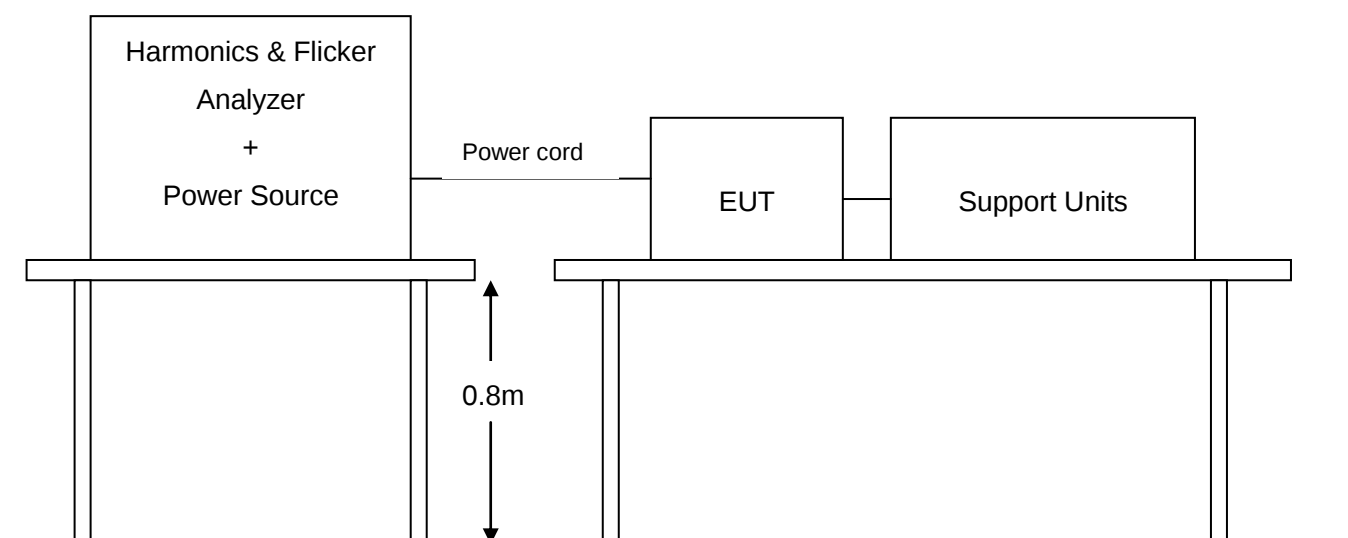
2.No limits apply for equipment with an active input power up to and including 75W.

10. VOLTAGE FLUCTUATION / FLICKER TEST

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-3
Limits	§5 of EN 61000-3-3
Temperature	25°C
Humidity	55%

10.1. BLOCK DIAGRAM OF TEST SETUP



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10.2. RESULT

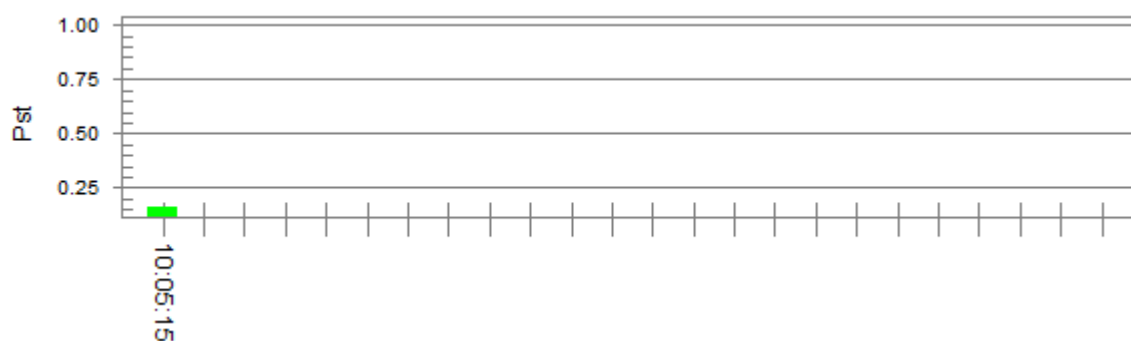
Flicker Test Summary per EN 61000-3-3 (Run time)

Test Result: Pass

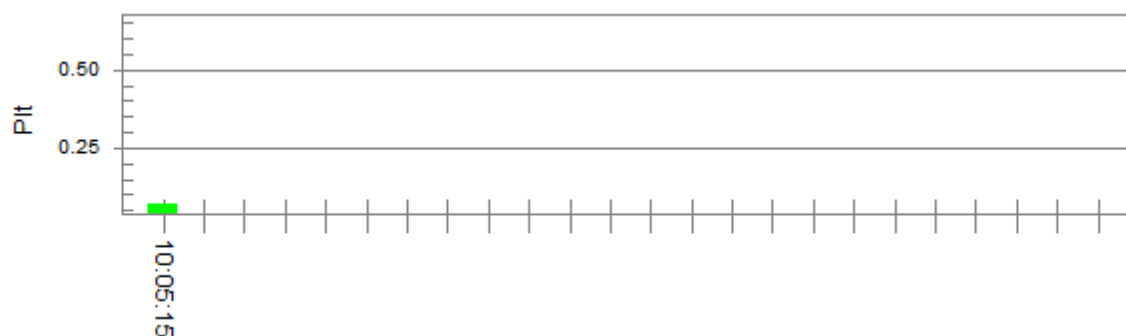
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.06

Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.160	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.070	Test limit:	0.650	Pass

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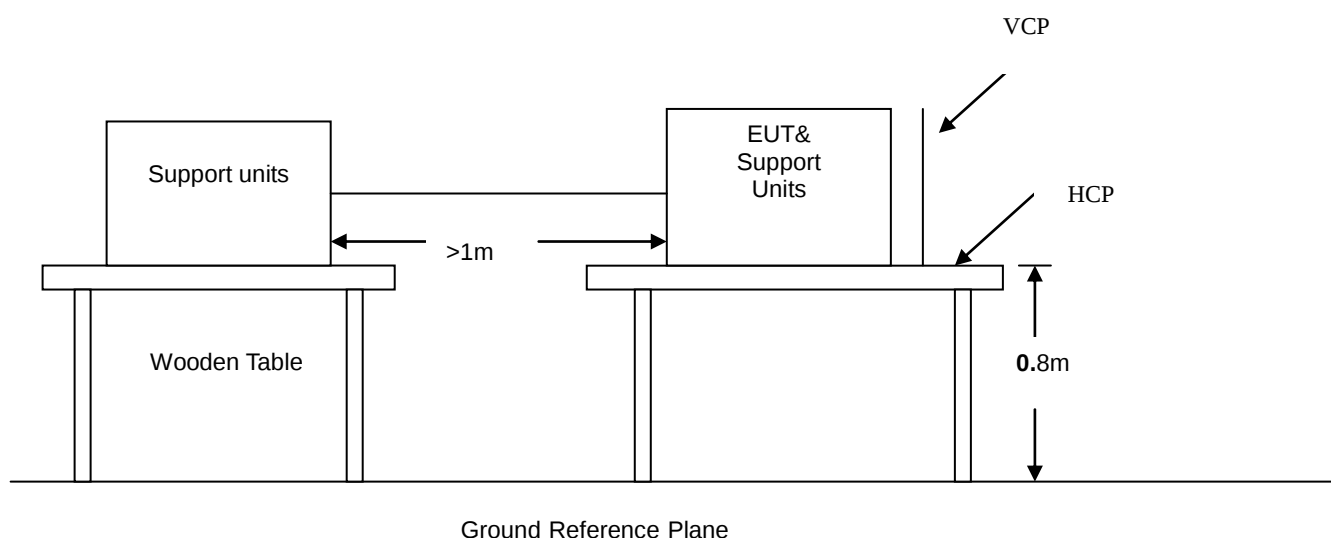
11. ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Temperature	25°C
Humidity	55%

11.1. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

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11.2. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Activates the communication function if the EUT with such port(s).

As per the requirement of EN 55035: Contact discharge is the preferred test method. 20 discharges (10 with positive and 10 negative polarity) shall be applied on each accessible metal part of the enclosure. In case of a non-conductive enclosure, discharges shall be applied on the horizontal or vertical coupling planes as specified in EN 61000-4-2.

Air discharges shall be used where contact discharges cannot be applied.

The following test condition was followed during the tests.

Note: As per the A2 to EN 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

11.3. PERFORMANCE & RESULT

Amount of Discharges	Voltage	Coupling	Performance	Result (Pass/Fail)
Mini 20 /Point	±4kV	Contact Discharge	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge HCP (Front)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge HCP (Left)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge HCP (Back)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge HCP (Right)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge VCP (Front)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge VCP (Left)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge VCP (Back)	No Function Loss	Pass
Mini 20 /Point	±4kV	Indirect Discharge VCP (Right)	No Function Loss	Pass
Mini 20 /Point	±8kV	Air Discharge	No Function Loss	Pass

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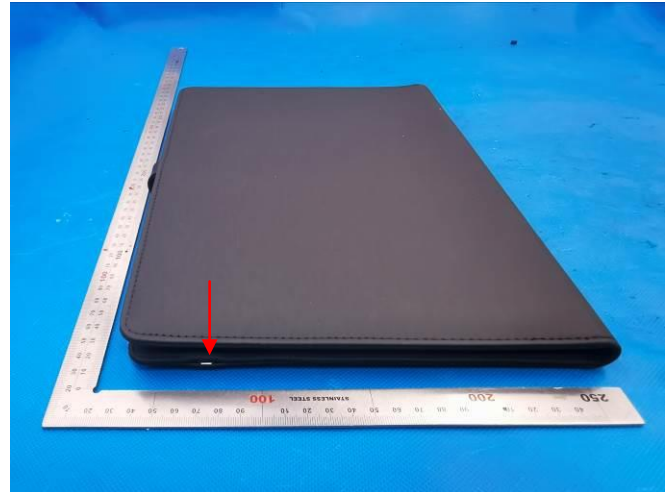
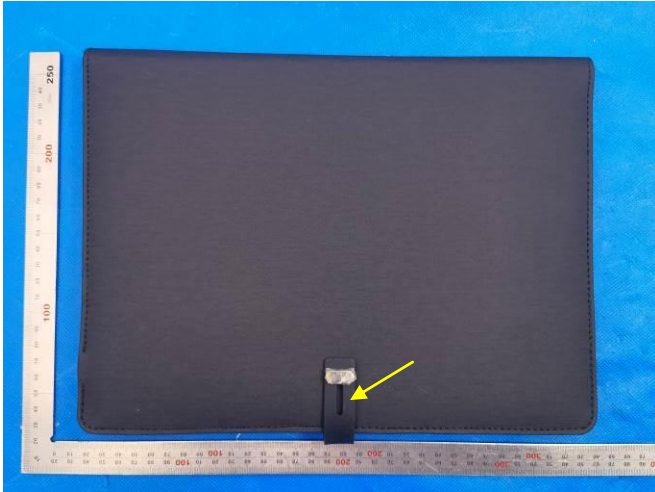
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ESD location:

Yellow line: Air discharge

Red line: Contact discharge



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11.4. PERFORMANCE & RESULT PERFORMANCE

☒ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ PASS ☐ FAIL
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12. RADIATED, RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST

12.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-3
Frequency Range	80-1000, 1800, 2600, 3500, 5000(MHz)
Field Strength	3V/m
Modulation	1 kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3m
Antenna Height	1.5m
Dwell Time	3 seconds

12.2. TEST PROCEDURE

The test procedure was in accordance with EN 61000-4-3.

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The test signal was 80% amplitude modulated with a 1 kHz sine wave.
- The frequency range was swept at 80-1000, 1800, 2600, 3500, 5000(MHz) with the exception of the exclusion band for transmitters, receivers and duplex transceivers. 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 field strength level was 3V/m.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

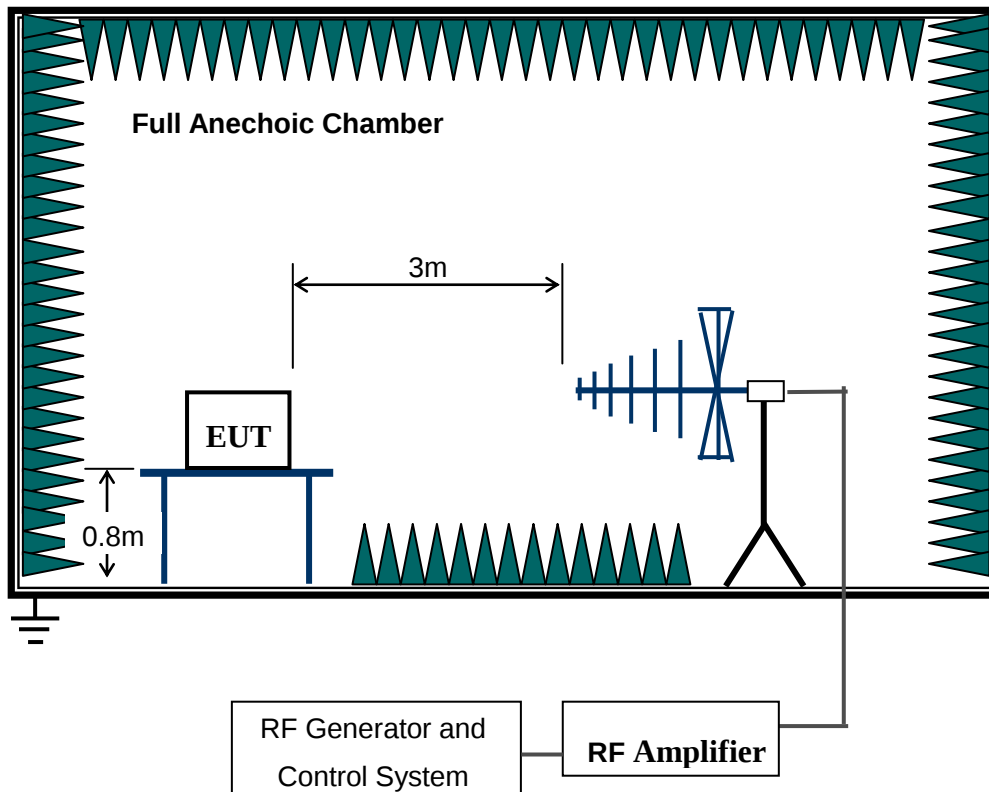
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12.3. TEST SETUP



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

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12.4. TEST RESULT

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Observation	performance	Result (Pass/Fail)
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Front	No Function Loss	A	PASS
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Back	No Function Loss	A	PASS
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Left	No Function Loss	A	PASS
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Right	No Function Loss	A	PASS
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Top	No Function Loss	A	PASS
80-1000,1800,2600,3500,5000	3V/m	Yes	H / V	Bottom	No Function Loss	A	PASS

Note: operating mode include all modes of EMS in page 6.

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12.5. PERFORMANCE

☒ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. The measured acoustic interference ratio during the test are less than -20 dB.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ PASS	☐ FAIL
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13. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

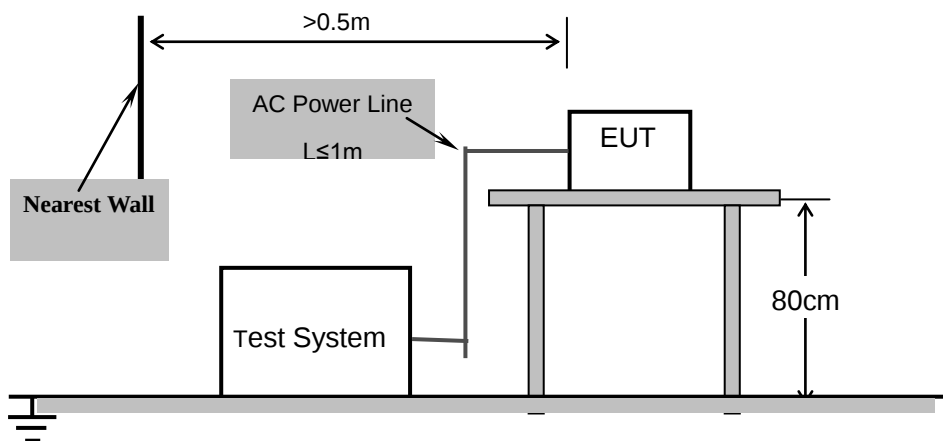
13.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-4
Test Voltage	a.c. power port – 1 kV
Polarity	Positive/Negative
Impulse Frequency	5kHz
Impulse wave shape	5/50ns
Burst Duration	15ms
Burst Period	300ms
Test Duration	Not less than 1 min.

13.2. TEST PROCEDURE

1. The EUT was tested with 1000 volt discharges to the AC power input leads.
2. Both positive and negative polarity discharges were applied.
3. The length of the “hot wire” from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.
4. The duration time of each test sequential was 1 minute.
5. The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

13.3. TEST SETUP



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

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13.4. TEST RESULT

Test Point	Polarity	Test Level (kV)	Observation	performance	Conclusion
a.c. port, L	+/-	1	No function loss	A	Pass
a.c. port, N	+/-	1	No function loss	A	Pass
a.c. port, L-N	+/-	1	No function loss	A	Pass

Note: operating mode include all modes of EMS in page 6.

13.5. PERFORMANCE

☒ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ PASS	☐ FAIL
---	--------------------------------------

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14. SURGE IMMUNITY TEST

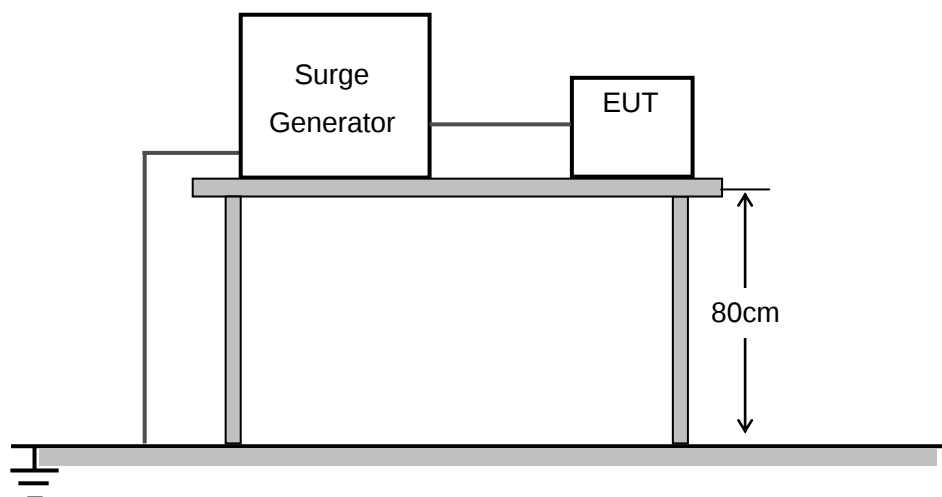
14.1. TEST SPECIFICATION

Basic Standard	EN 61000-4-5
Waveform	Voltage 1.2/50 μ s; Current 8/20 μ s
Test Voltage	a.c. power port, line to line 1.0 kV,
Polarity	Positive/Negative
Phase Angle	90°, 270°
Repetition Rate	60sec
Times	5 time/each condition.

14.2. TEST PROCEDURE

- The EUT and the auxiliary equipment were placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT was less than 2 meters (provided by the manufacturer).
- The EUT was connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
- The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.

14.3. TEST SETUP



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

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14.4. TEST RESULT

Coupling Line	Polarity	Voltage (kV)	Observation	performance	Conclusion
a.c. power, L-N	+/-	1.0	No function loss	A	Pass

Note: operating mode include all modes of EMS in page 6.

14.5. PERFORMANCE

☒ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ PASS	☐ FAIL
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15. IMMUNITY TO CONDUCTED DISTURBANCES INDUCED BY RF FIELDS

15.1. TEST SPECIFICATION

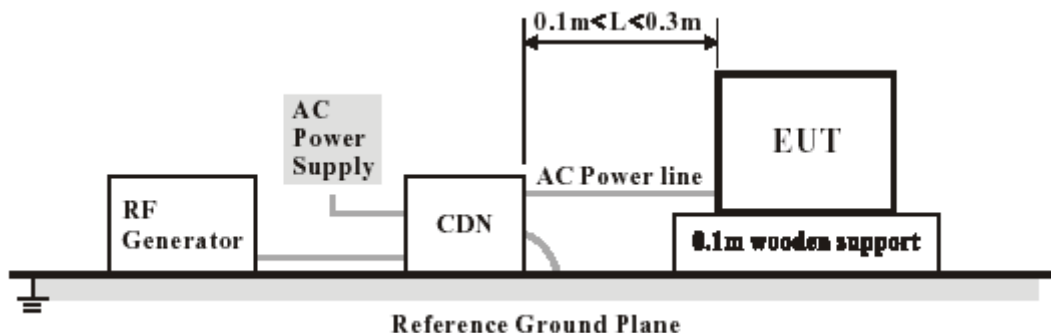
Basic Standard	EN 61000-4-6
Frequency Range	0.15 MHz – 80 MHz
Field Strength	0.15~10MHz 3Vrms,10~30MHz 3 to 1Vrms,30~80MHz 1Vrms
Modulation	1 kHz Sine Wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	a.c. power line
Coupling Device	CDN-M2

15.2. TEST PROCEDURE

1. The EUT shall be tested within its intended operating and climatic conditions.
2. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.
3. The test signal was 80% amplitude modulated with a 1 kHz sine wave
4. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5×10^{-3} decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.
5. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.
6. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

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15.3. TEST SETUP



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

15.4. TEST RESULT

EUT Working Mode	Test Point	Frequency (MHz)	Field Strength (Vrms)	Observation	performance	Conclusion
Normal	a.c. port	0.15 – 10	3	No function loss	A	Pass
Normal	a.c. port	10 – 30	3 to1	No function loss	A	Pass
Normal	a.c. port	30 – 80	1	No function loss	A	Pass

Note: operating mode include all modes of EMS in page 6.

15.5. PERFORMANCE

☒ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. The measured acoustic interference ratio during the test are less than -20 dB.
☐ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☐ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**
☐ **FAIL**

16. VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY TEST

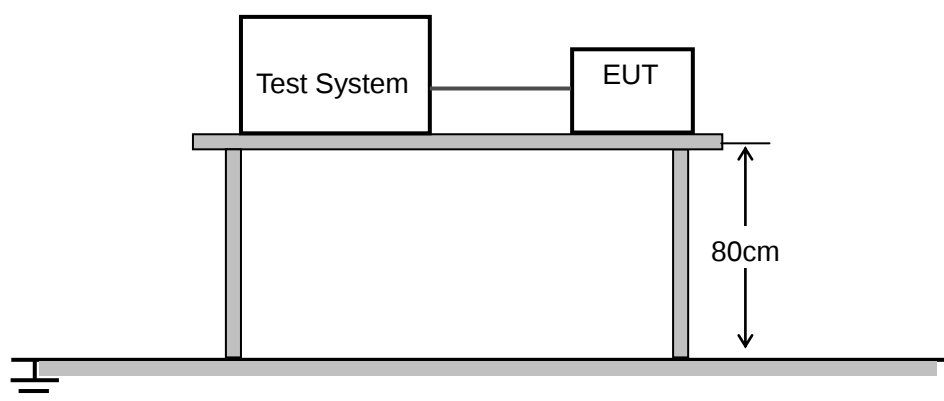
16.1. TEST SPECIFICATION

Basic Standard	EN61000-4-11
Voltage Dips	100% reduction, 0.5 Cycle 30% reduction, 25 Cycles
Voltage Interruptions	100% reduction, 250 Cycles
Voltage Phase Angle	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°

16.2. TEST PROCEDURE

- The power cord was used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.
- The EUT was tested for (1) 100% voltage dip of supplied voltage with duration of 0.5 cycles, (2) 30% voltage dip of supplied voltage and duration 25 cycles. (3) 100% voltage interruption of supplied voltage with duration of 250 Cycles was followed.
- Voltage reductions occur at 0 degree crossover point of the voltage waveform. The performance of the EUT was checked after the voltage dip or interruption.

16.3. TEST SETUP



For the actual test configuration, please refer to Appendix A : Photographs of the Test Configuration.

16.4. TEST RESULT

Test Mode	Voltage Reduction	Duration (cycle)	Times	Interval (ms)	Observation	performance	Conclusion
Voltage dips	100%	0.5	3	10	No function loss	B	Pass
	30%	25	3	500	No function loss	B	Pass
Voltage interruptions	100%	250	3	5000	No function loss	C	Pass

Note: operating mode include all modes of EMS in page 6.

16.5. PERFORMANCE

☐ Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
☒ Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
☒ Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ **PASS**
☐ **FAIL**

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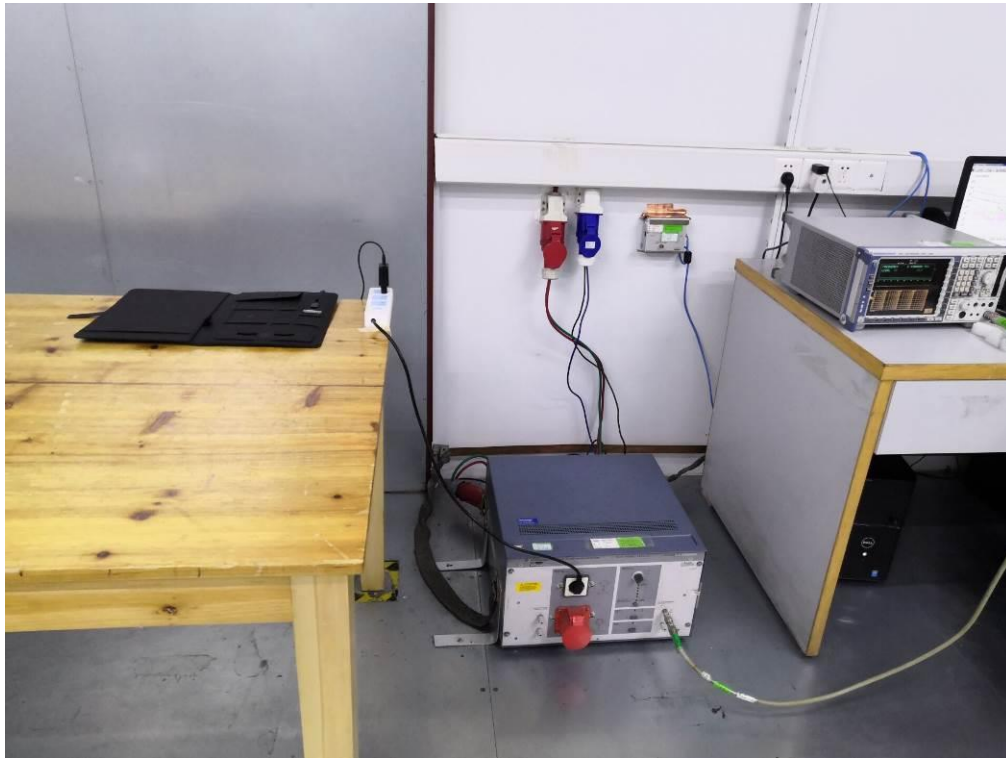
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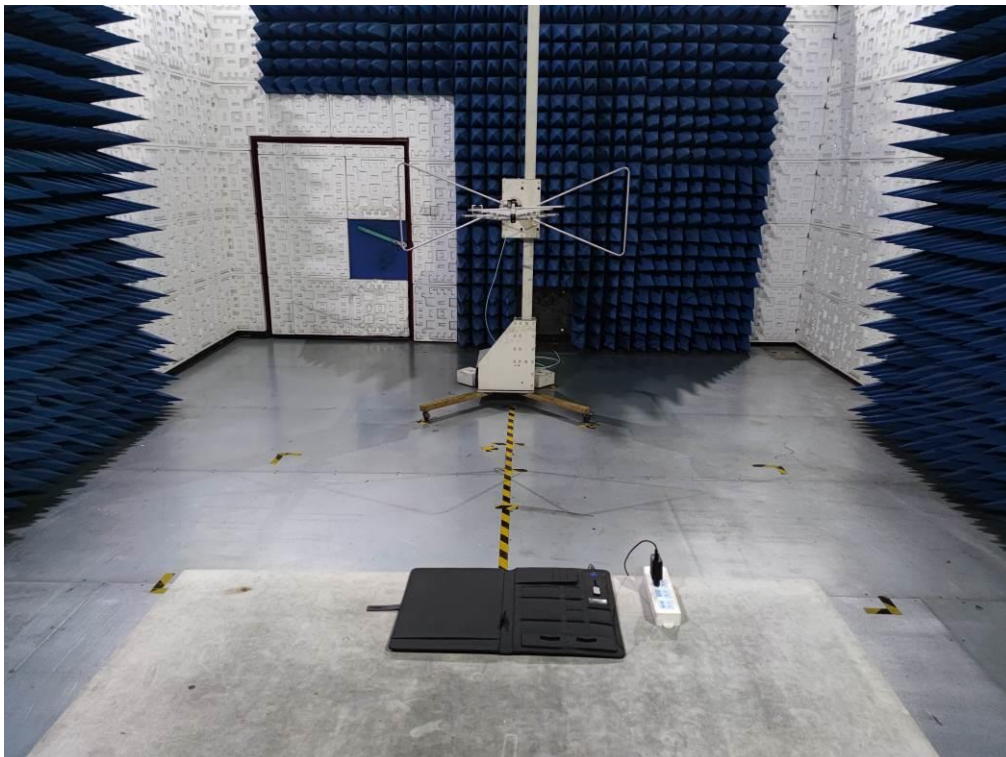
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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION TEST SETUP



RADIATED EMISSION TEST SETUP (BELOW 1GHz)

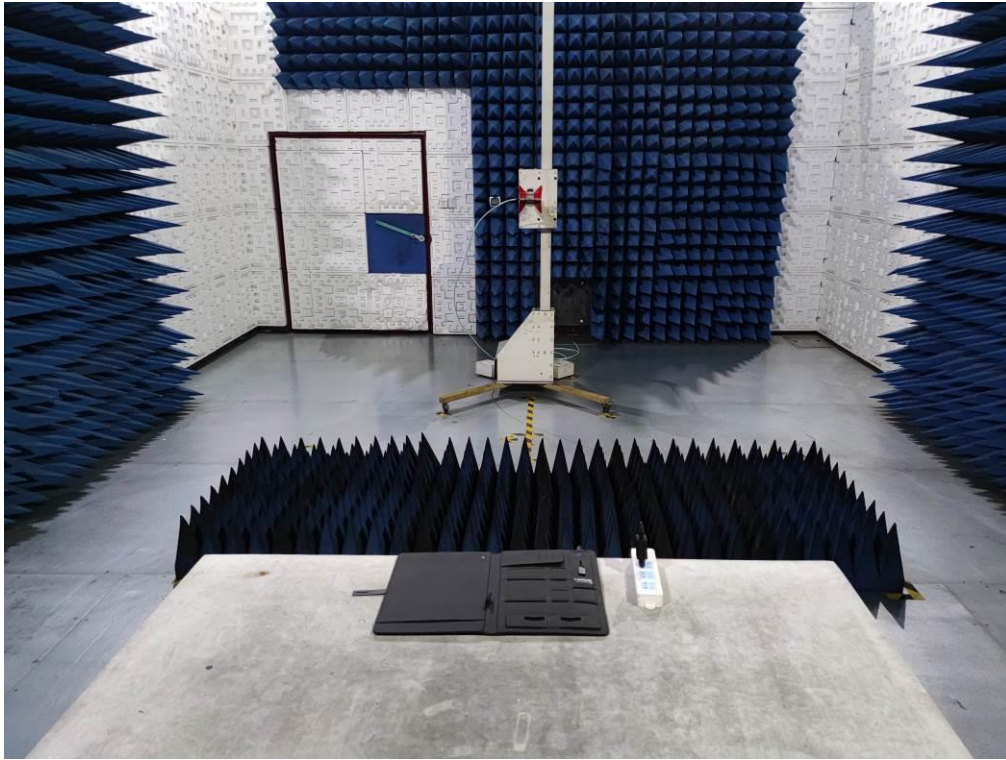
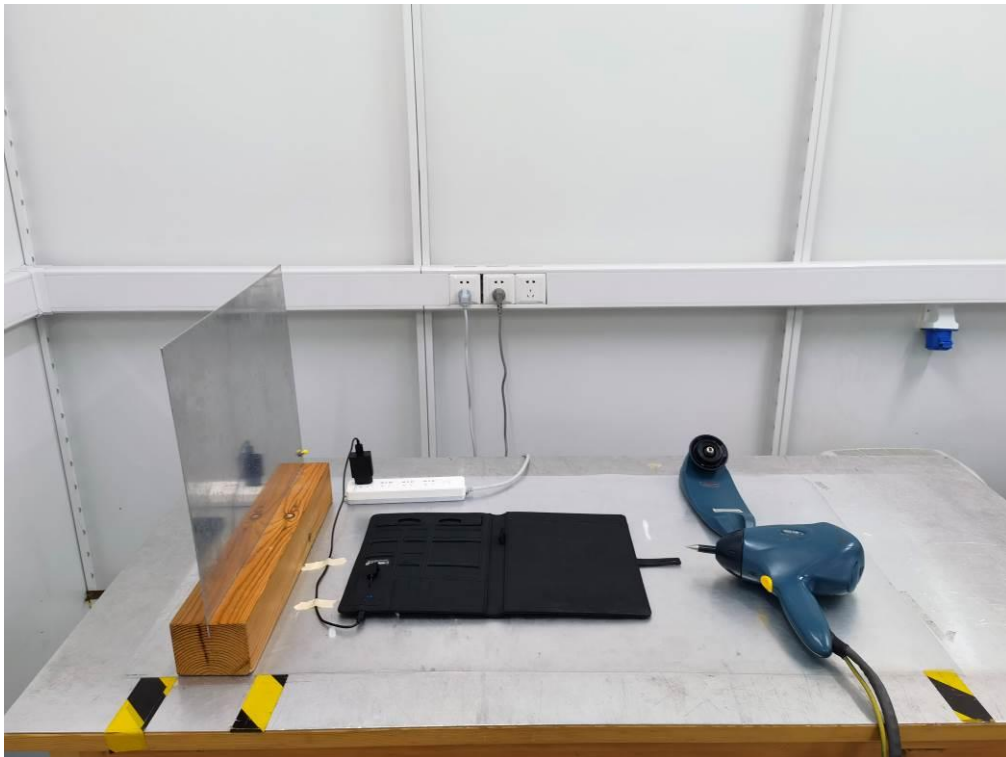


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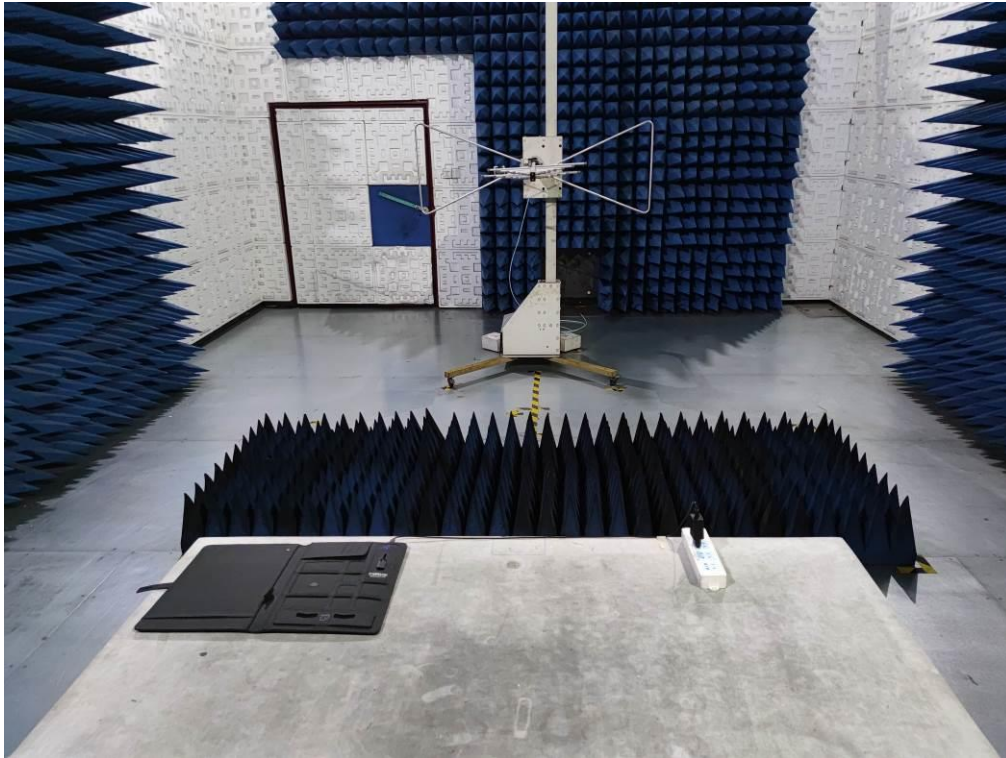
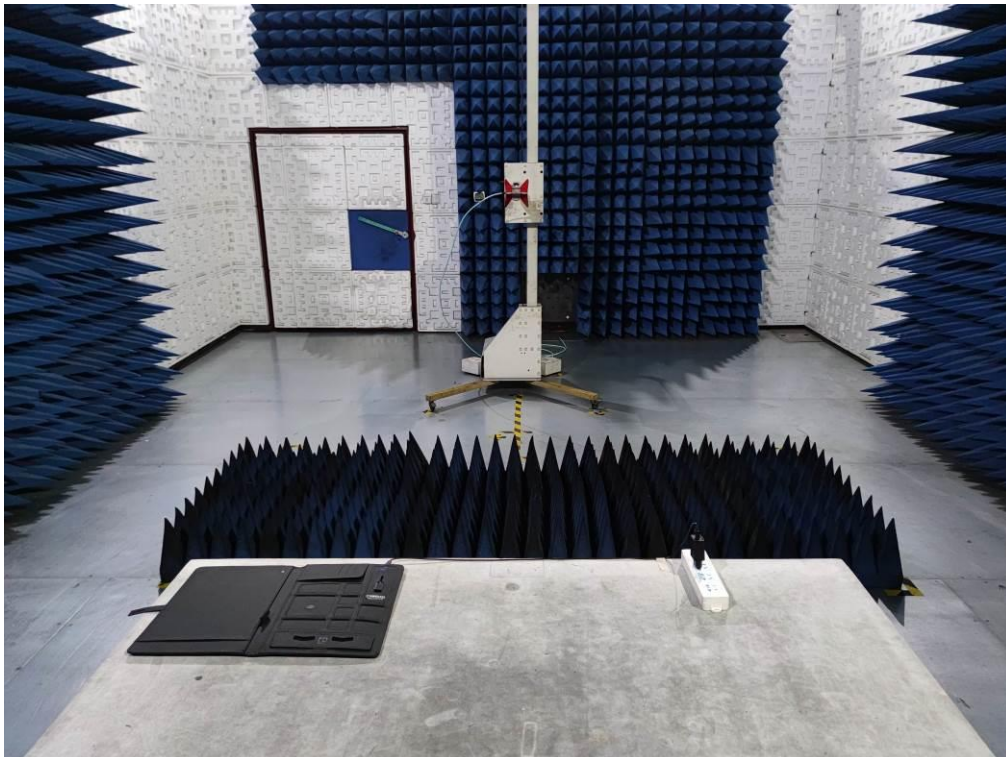
RADIATED EMISSION TEST SETUP (ABOVE 1GHz)**EN 61000-4-2 ESD TEST SETUP**

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EN 61000-4-3 RS TEST SETUP (BELOW 1GHz)**EN 61000-4-3 RS TEST SETUP (ABOVE 1GHz)**

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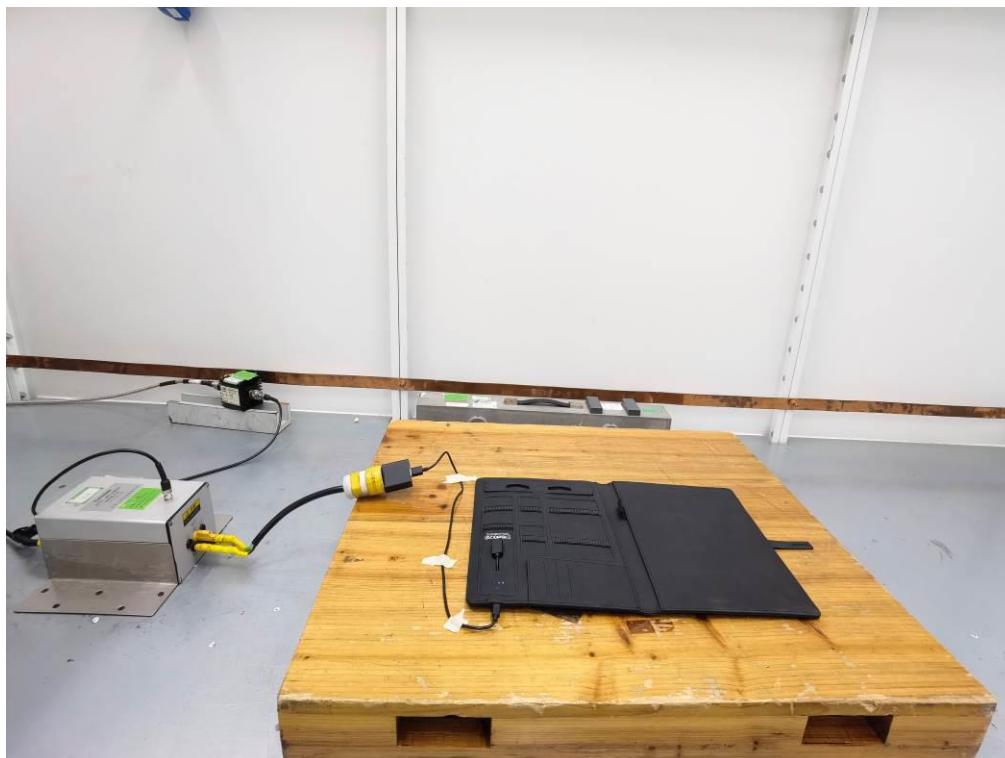
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POWER HARMONICS AND VOLTAGE FLICKER/FLUCTUATION TEST**EFT / SURGE / DIPS IMMUNITY TEST**

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CS IMMUNITY TEST

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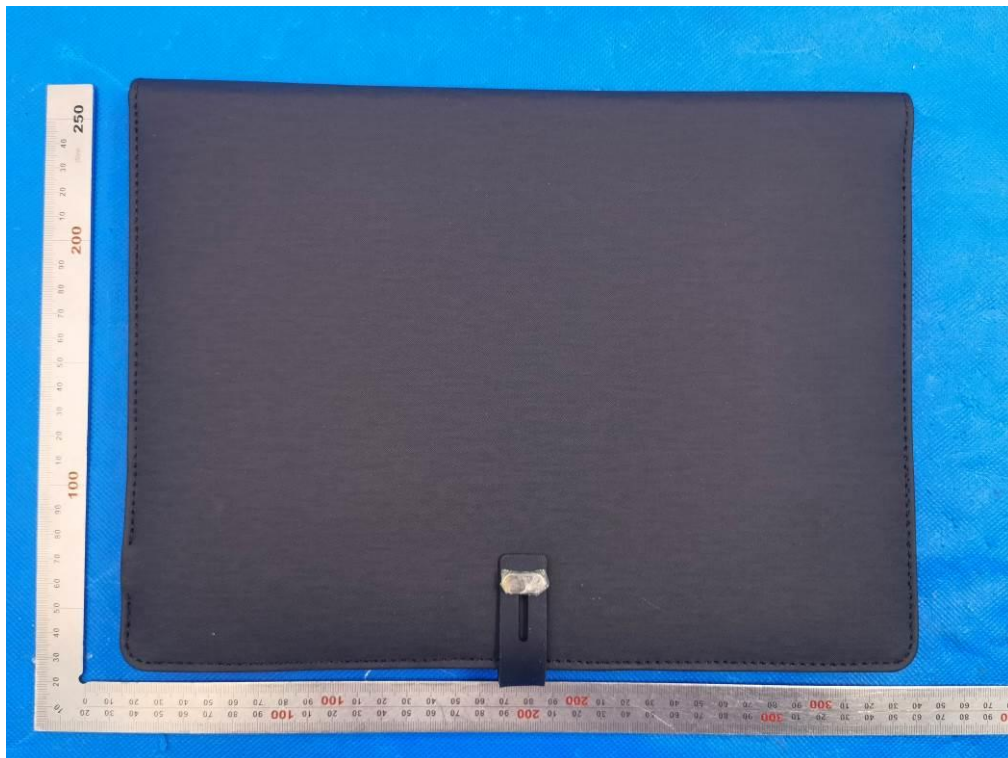
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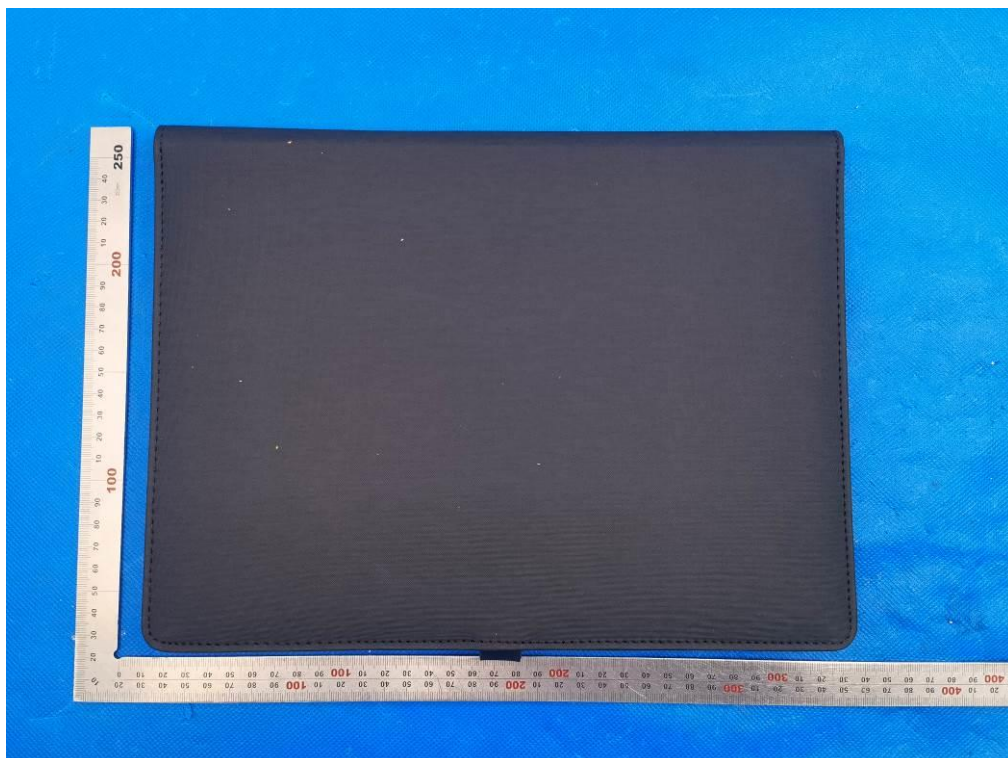
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APPENDIX B: PHOTOGRAPHS OF EUT

EXTERNAL VIEW-1 OF EUT



EXTERNAL VIEW-2 OF EUT



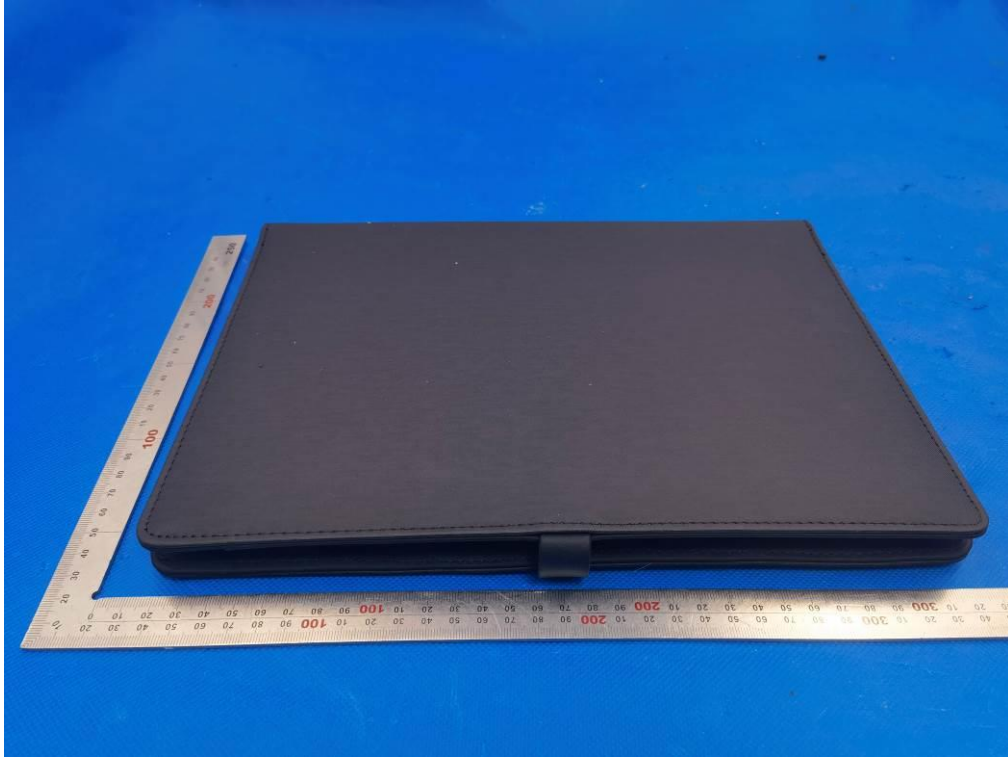
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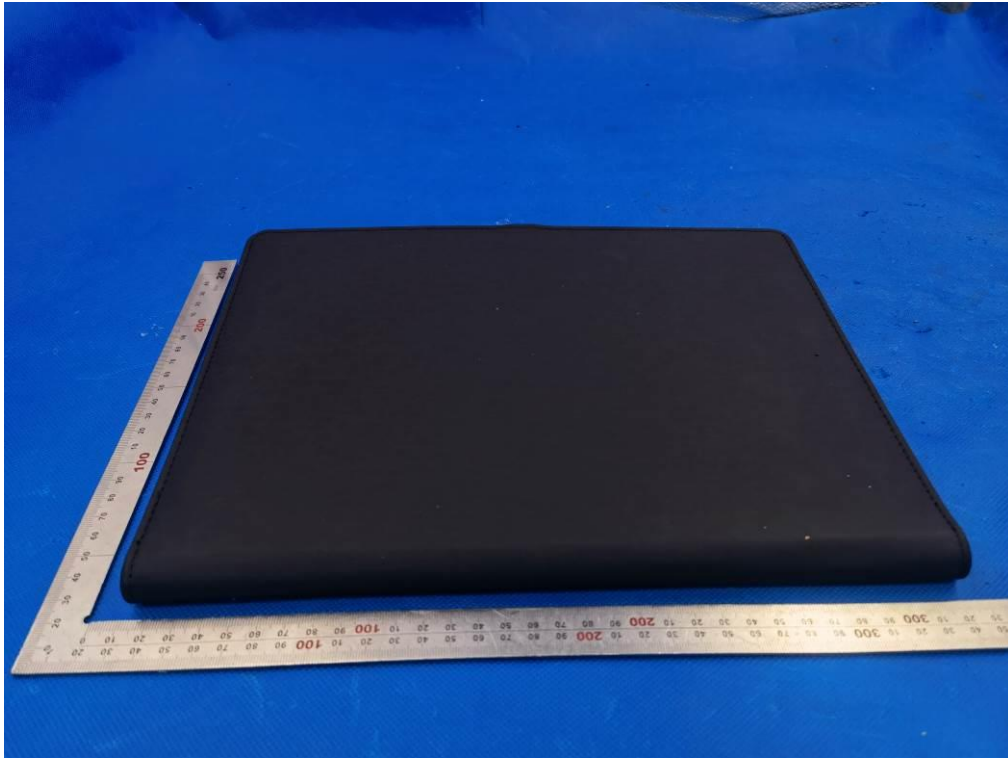
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EXTERNAL VIEW-3 OF EUT



EXTERNAL VIEW-4 OF EUT



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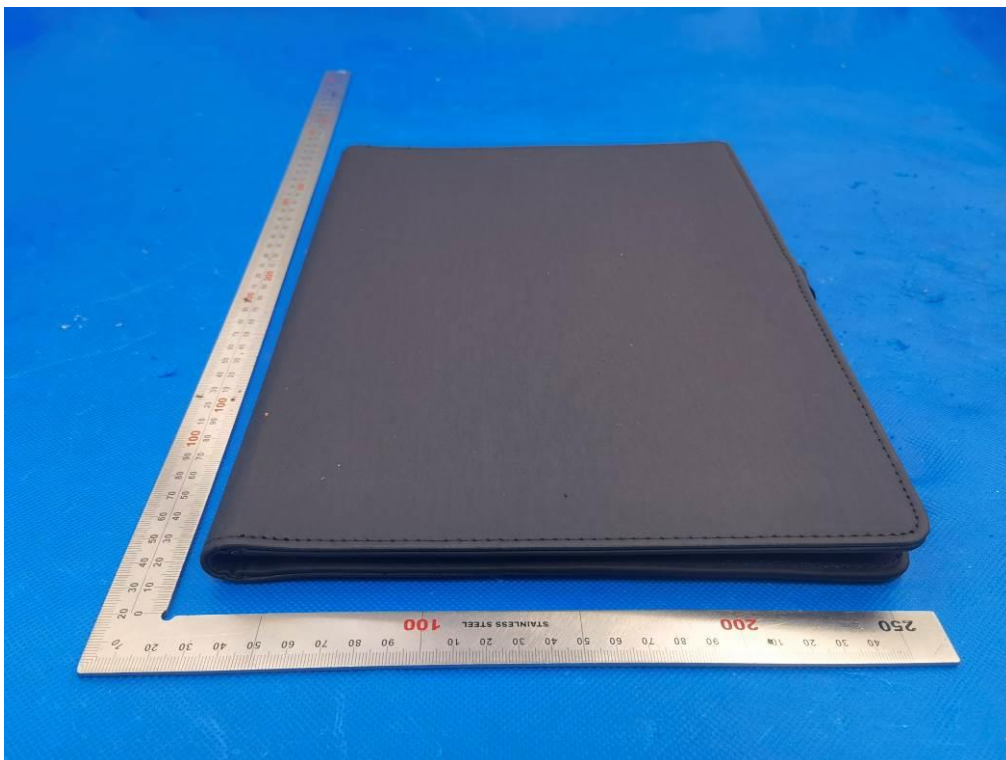
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EXTERNAL VIEW-5 OF EUT



EXTERNAL VIEW-6 OF EUT



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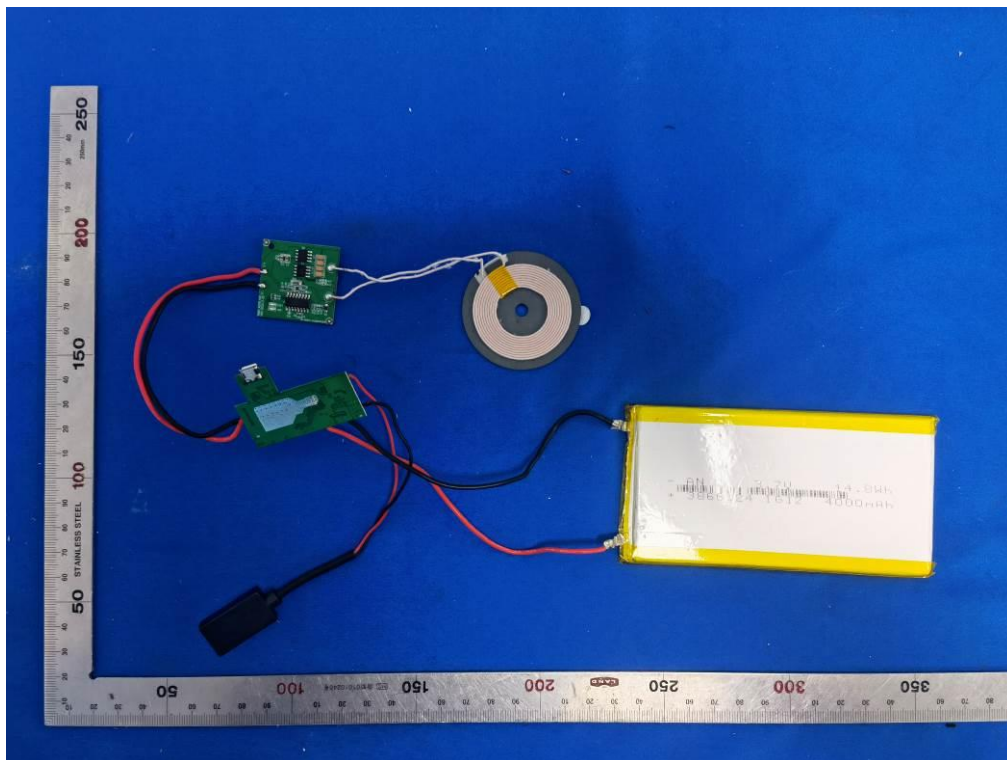
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OPEN VIEW-1 OF EUT



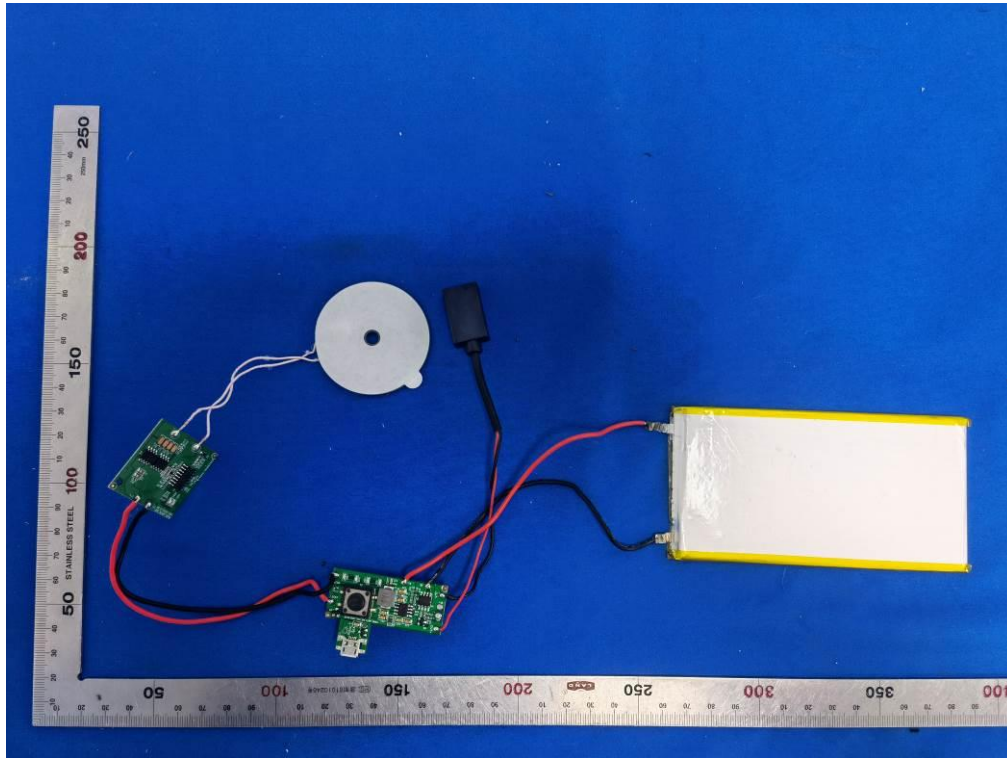
OPEN VIEW-2 OF EUT



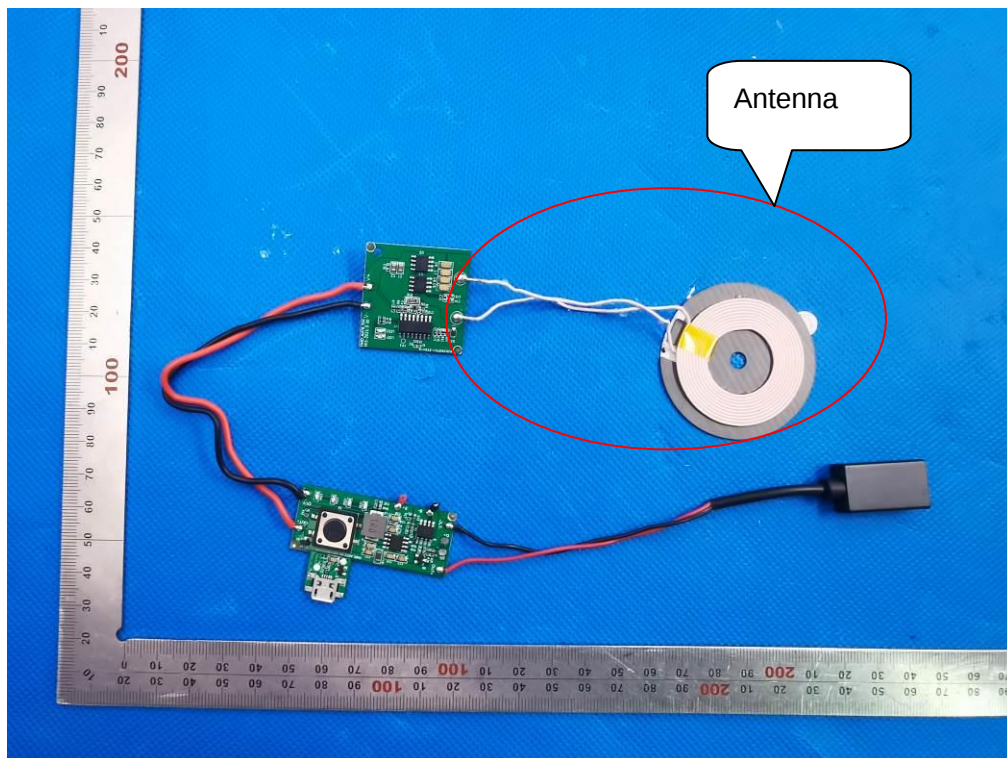
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OPEN VIEW-3 OF EUT



OPEN VIEW-4 OF EUT



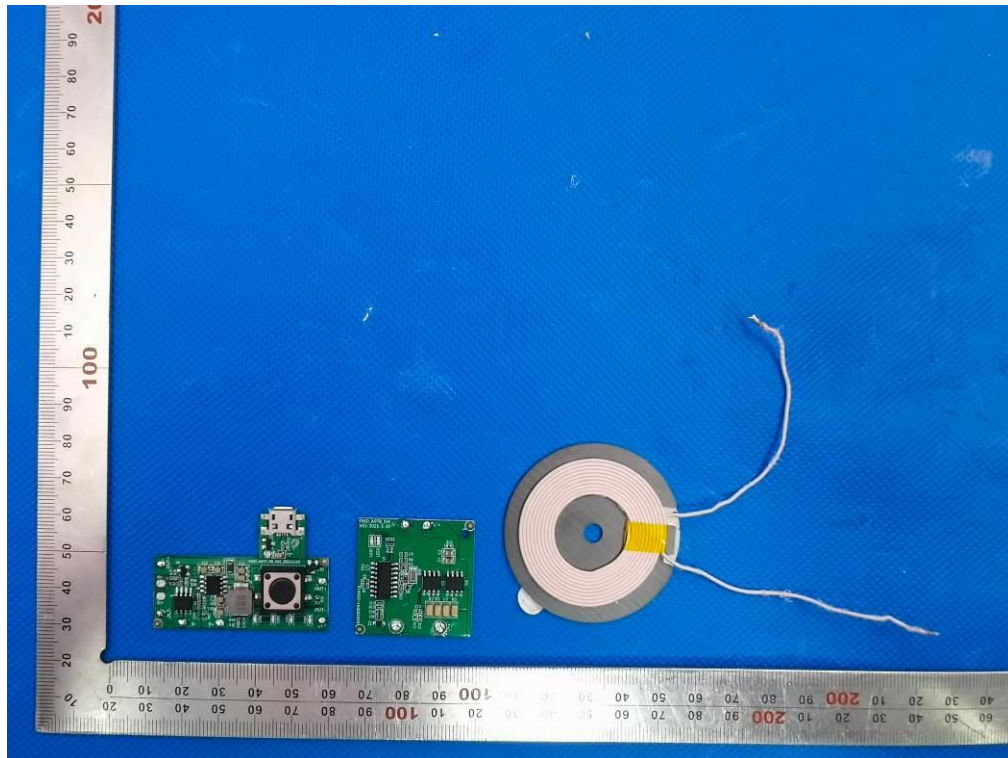
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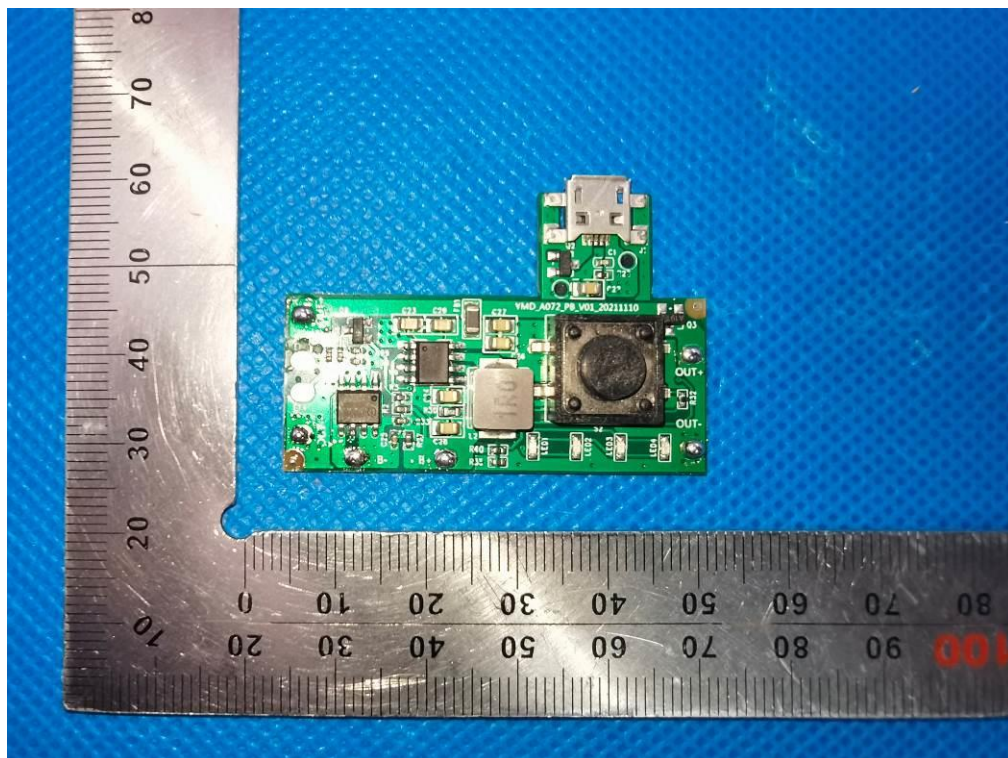
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INTERNAL VIEW-1 OF EUT



INTERNAL VIEW-2 OF EUT



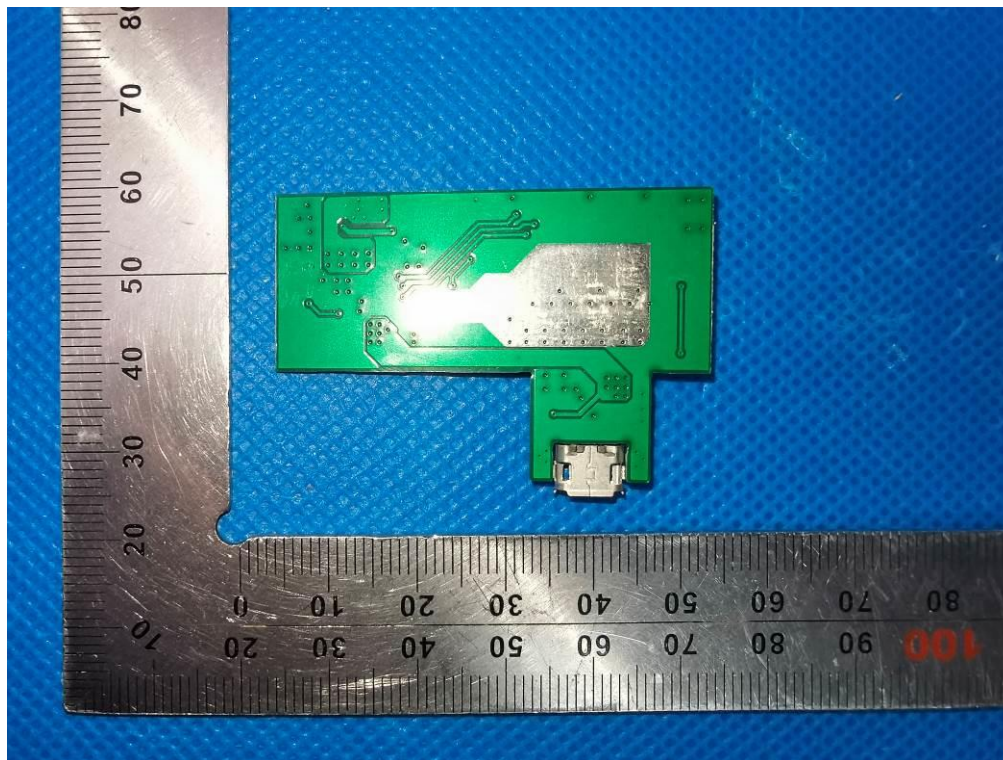
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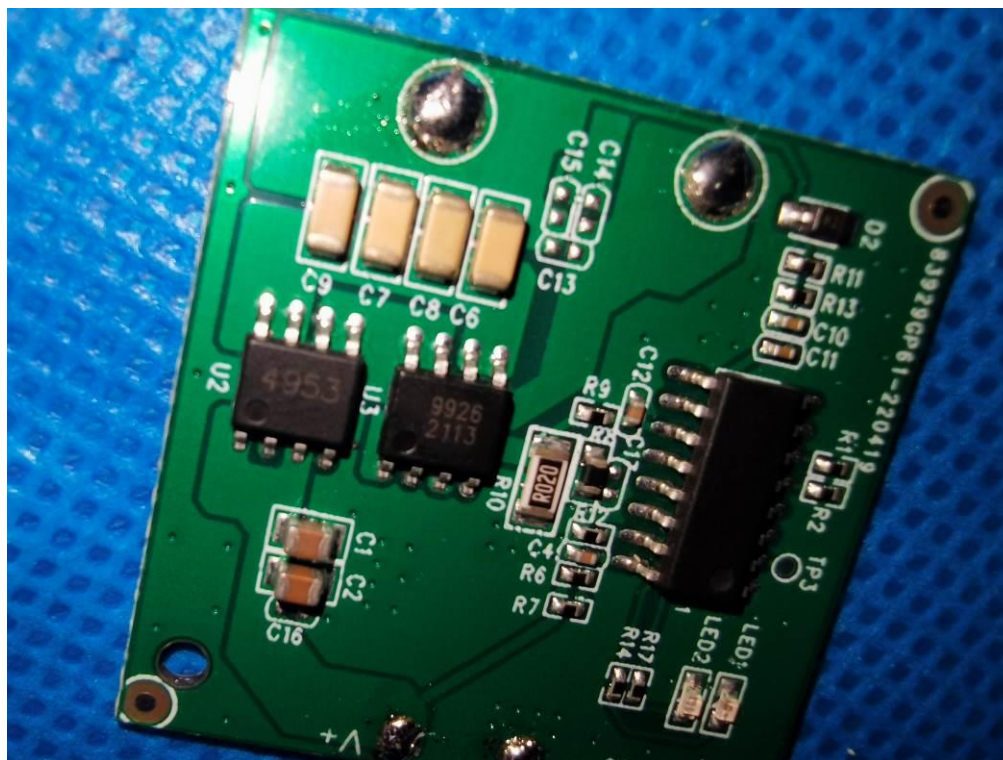
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INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd. (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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