



中国认可
国际互认
检测
TESTING
CNAS L4062



TEST REPORT

Reference No...... : WTF23X11233558W003
Manufacturer : Mid Ocean Brands B.V.
Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory : 114538
Product Name : Wireless Powerbank
Model No...... : MO2185
Standards : **ETSI EN 301 489-1 V2.2.3 (2019-11)**
Draft ETSI EN 301 489-3 V2.3.0 (2022-07)
Date of Receipt sample : 2023-11-01
Date of Test..... : 2023-11-01 to 2023-11-24
Date of Issue : 2023-11-24
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	2023-11-24	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Wireless Powerbank
Trade Name:	/
Model No.:	MO2185
Adding Model(s):	/
Rated Voltage:	Input(Type-C):DC5V,9V,12V Output(Type-C):DC5V,9V,12V Output(USB-A):DC5V,9V,12V
Wireless output:	Output: 15W(MAX)
Software Version:	/
Hardware Version:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
WPT	
Frequency Range:	110-205kHz
Radiated H-Field:	28.68dBuA/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.

Draft ETSI EN 301 489-3 V2.3.0 (2022-07): 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 for ElectroMagnetic Compatibility

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	Connect to the Adapter; AC230V 50Hz for adapter, Wireless Charging (MAX OUTPUT)
TM2	Wireless Charging	TT,CT for EMS testing

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C Cable	0.3	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
Adapter	XIAOMI	MDY-11-EX	/



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 ± 4.52 dB @0.2-1GHz ± 5.56 dB @1-6GHz ± 3.84 dB @6-18GHz ± 3.92 dB
Uncertainty for Conducted Emission	@9-150kHz ± 3.74 dB @0.15-30MHz ± 3.34 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
<input type="checkbox"/> Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
<input type="checkbox"/> Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber B: Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10457	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Chamber C: Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
<input type="checkbox"/> Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
8-WIRE ISN	Schwarz beck	8158	CAT3-8158-0059	2023-02-25	2024-02-24
8-WIRE ISN	Schwarz beck	8158	CAT5-8158-0117	2023-02-25	2024-02-24



<input checked="" type="checkbox"/> Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24
EMF					
VDH Test Head	AFJ	VDH 30	SC022Z	2023-02-25	2024-02-24
3 Loop Antenna					
Loop Antenna	ZHINAN	ZN30401	19037	2023-02-25	2025-02-24
Clamp					
Clamp	Luthi	MDS21	3809	2023-02-27	2024-02-26
PFMF					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2023-02-25	2024-02-24
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2023-02-25	2024-02-24
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2023-02-25	2024-02-24
H/F					
Digital Power Analyzer	California Instrument	CTS	72831	2023-02-25	2024-02-24
Power Source	California Instrument	5001IX-CTS-400	60077	2023-02-25	2024-02-24
ESD					
ESD Generator	LIONCEL	ESD-203B	0170901	2023-03-14	2024-03-13
EFT/SURGE/DIPS					
Transient 2000	EMC PARTNER	TRA2000	836	2023-02-25	2024-02-24
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2023-02-25	2024-02-24
CS					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2023-02-25	2024-02-24
Attenuator	EMTEST	MA-5100/6BF2	1009	2023-02-25	2024-02-24
CDN	Luthi	L-801M2/M3	2665	2023-02-25	2024-02-24
CDN	LIONCEL	CDN-T8	0210401	2023-02-25	2024-02-24
EM Clamp	TESEQ	KEMZ801A	45028	2023-02-25	2024-02-24
RS					
Signal Generator	HP	8665B	3438A00604	2023-02-25	2024-02-24
Power Sensor	Agilent	E9301A	MY52450001	2023-02-25	2024-02-24
Power Sensor	Agilent	E9304A	MY55081055	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-1000-25 0	MPA1906239	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-6000-10 0	MPA1906238	2023-02-25	2024-02-24
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A



Power Meter	Agilent	E4419B	GB42420578	2023-02-25	2024-02-24
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Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 1#)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission Room 2#)*	SKET	EMC-I	V2.0

*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	N/A
	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.

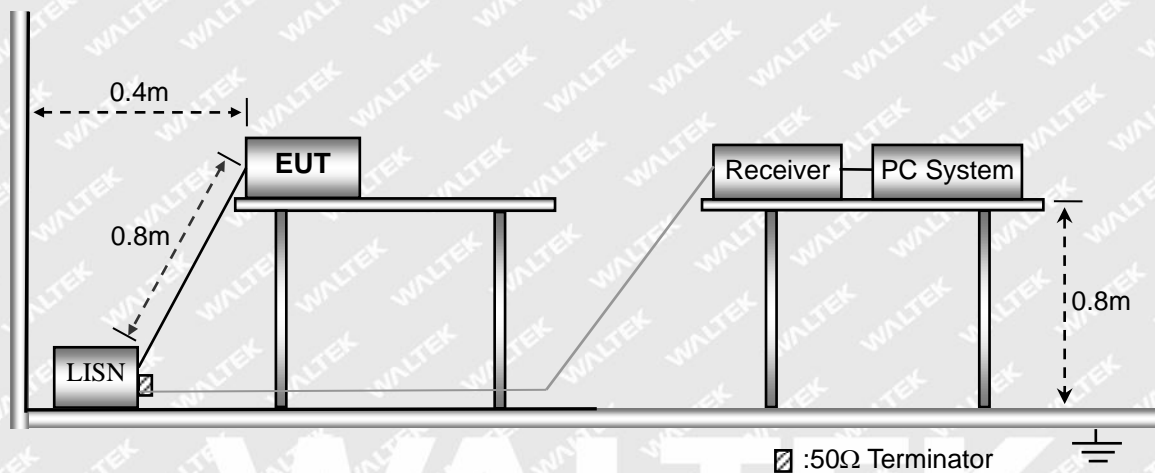


3. Conducted Emissions

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

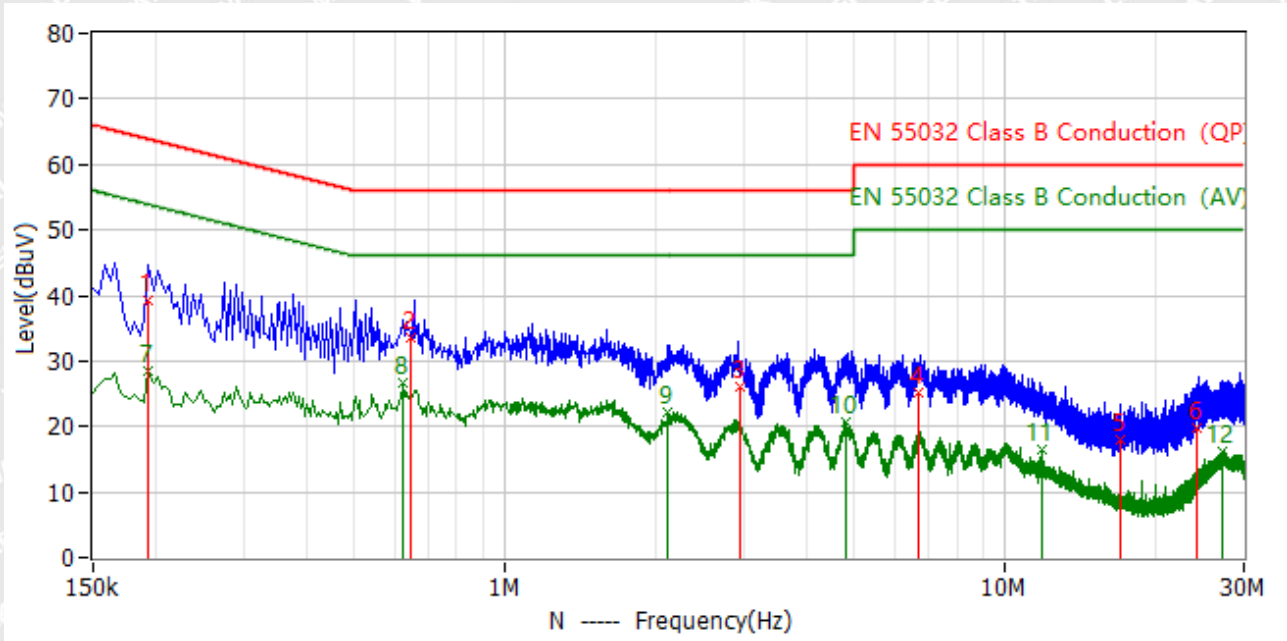
Temperature:	25 °C
Relative Humidity:	45 %
ATM Pressure:	1015 mbar

3.4 Conducted Emissions Test Data

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



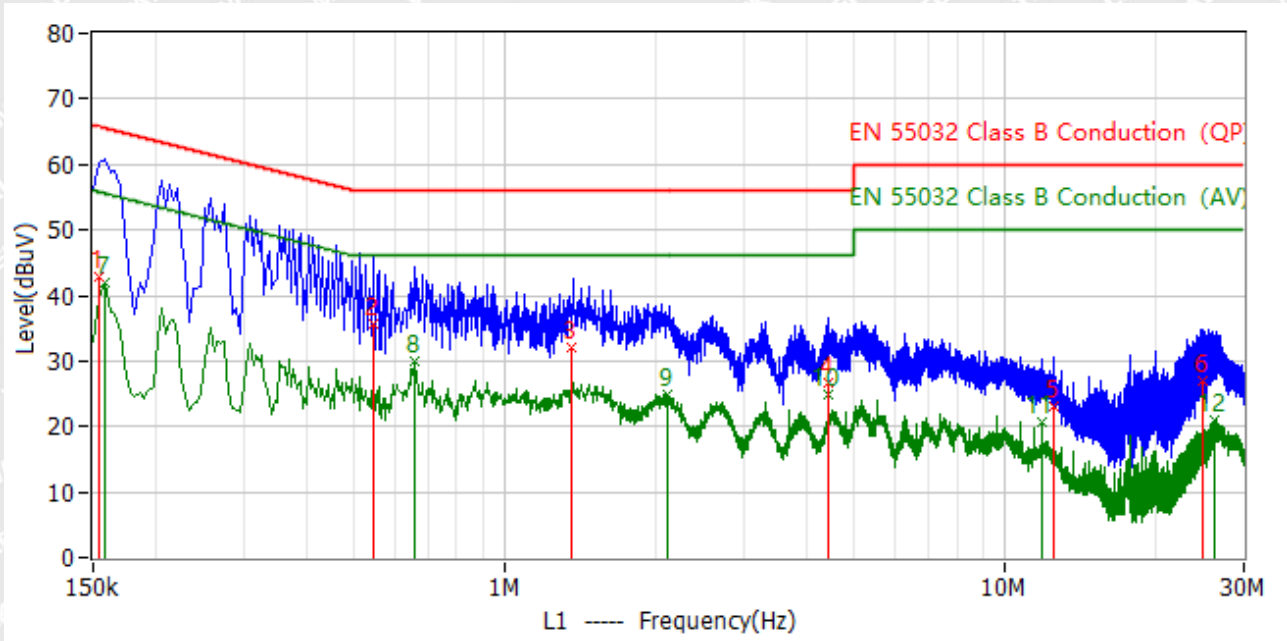
Test mode:	TM1	Polarity:	Neutral
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	194.000kHz	18.5	20.7	39.2	63.9	-24.6	QP
2	650.000kHz	13.0	20.7	33.7	56.0	-22.3	QP
3	2.942MHz	5.3	20.9	26.2	56.0	-29.8	QP
4	6.730MHz	4.6	20.7	25.3	60.0	-34.7	QP
5	16.966MHz	-2.3	20.4	18.1	60.0	-41.9	QP
6	24.210MHz	-0.4	20.1	19.7	60.0	-40.3	QP
7*	194.000kHz	7.7	20.7	28.4	53.9	-25.5	AV
8*	626.000kHz	5.9	20.7	26.6	46.0	-19.4	AV
9*	2.118MHz	1.5	20.8	22.3	46.0	-23.7	AV
10*	4.794MHz	-0.3	20.9	20.6	46.0	-25.4	AV
11*	11.798MHz	-4.2	20.8	16.6	50.0	-33.4	AV
12*	27.274MHz	-4.2	20.4	16.2	50.0	-33.8	AV



Test mode:	TM1	Polarity:	Line
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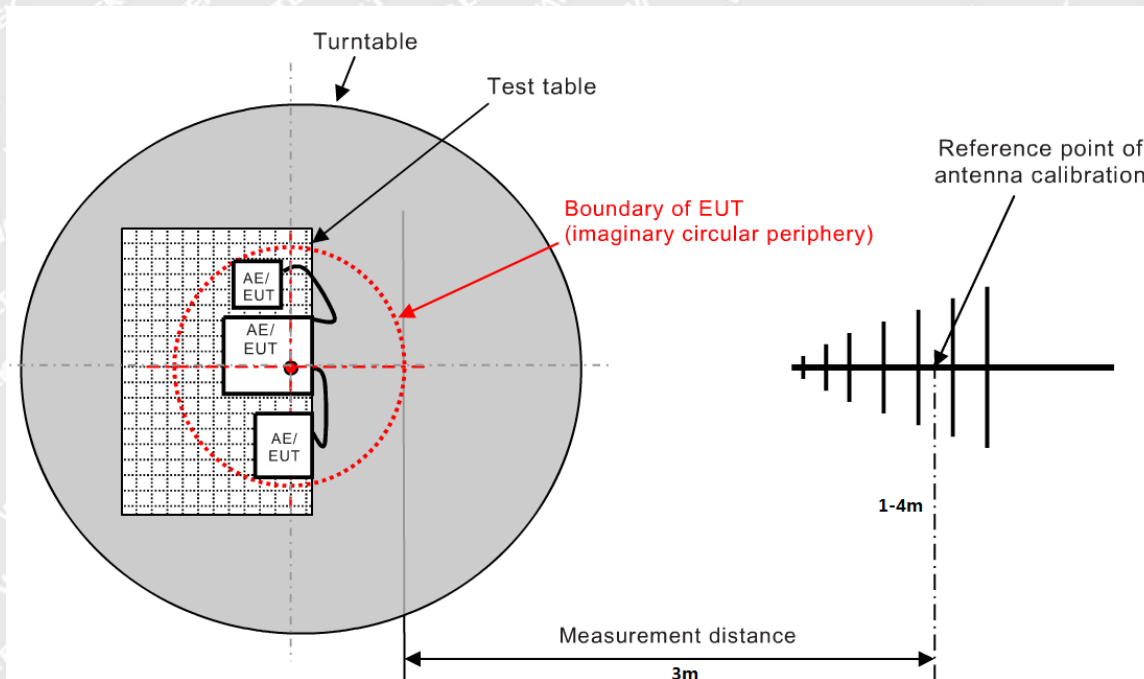
No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	154.000kHz	22.0	20.9	42.9	65.8	-22.9	QP
2	546.000kHz	15.1	20.7	35.8	56.0	-20.2	QP
3	1.358MHz	11.3	20.8	32.1	56.0	-23.9	QP
4	4.410MHz	5.8	20.9	26.7	56.0	-29.3	QP
5	12.526MHz	2.4	20.8	23.2	60.0	-36.8	QP
6	24.786MHz	6.8	20.1	26.9	60.0	-33.1	QP
7*	158.000kHz	21.0	20.9	41.9	55.6	-13.7	AV
8*	658.000kHz	9.2	20.7	29.9	46.0	-16.1	AV
9*	2.106MHz	4.1	20.8	24.9	46.0	-21.1	AV
10*	4.426MHz	3.9	20.9	24.8	46.0	-21.2	AV
11*	11.810MHz	-0.2	20.8	20.6	50.0	-29.4	AV
12*	26.142MHz	0.7	20.2	20.9	50.0	-29.1	AV



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

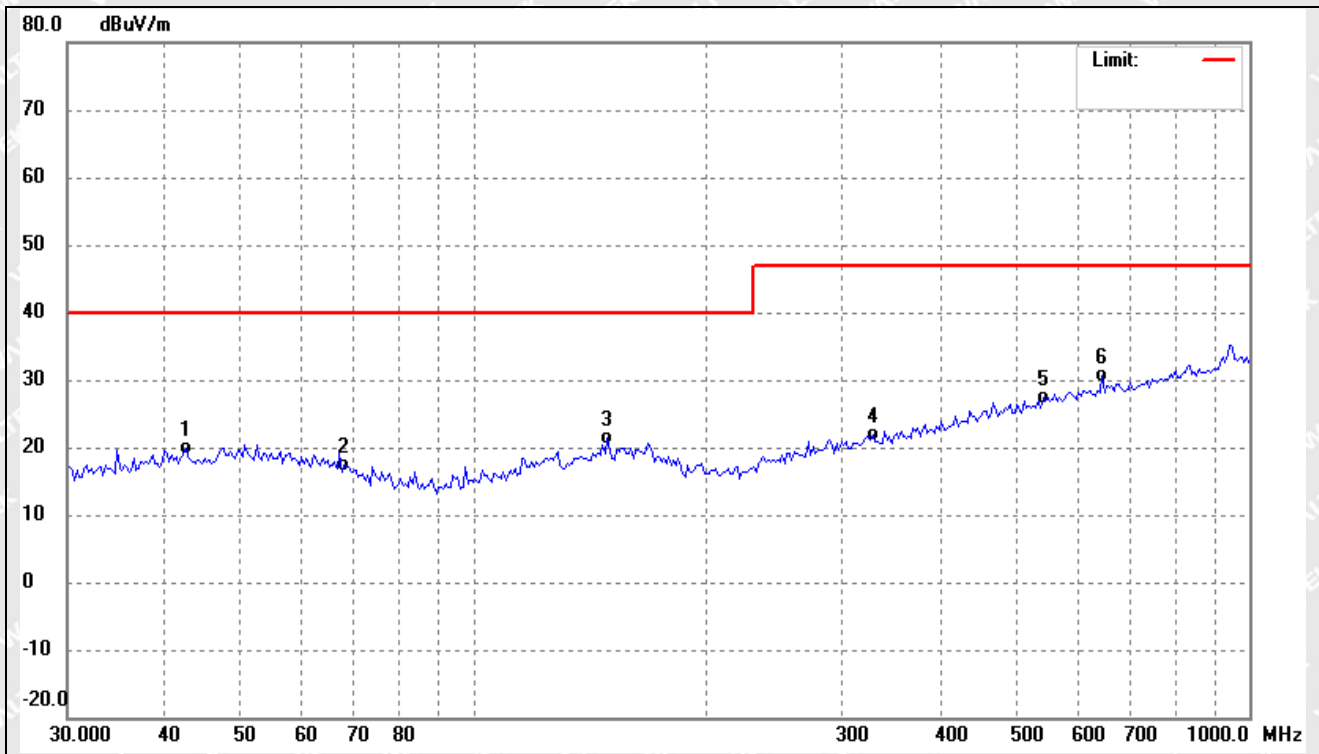
Temperature:	22° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

Note: Only show the worst case in the test report

➤ 30MHz to 1GHz

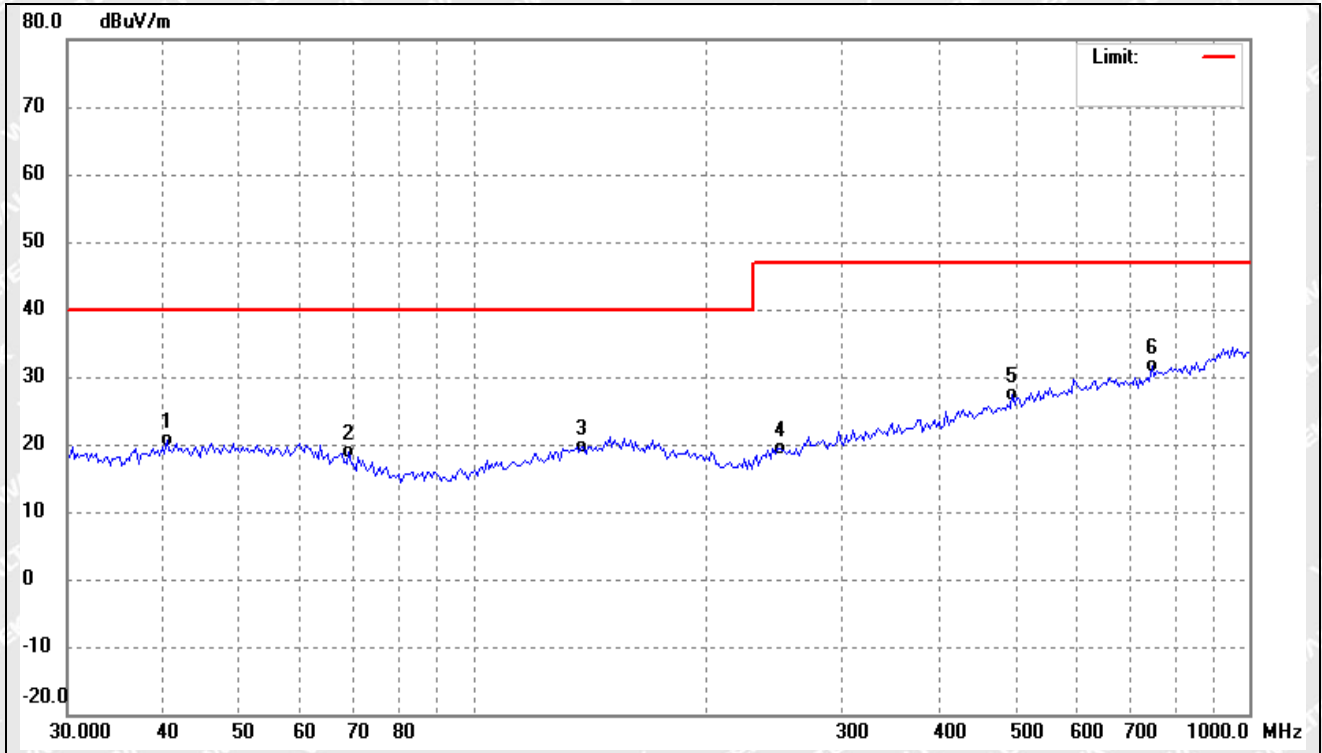
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.6298	28.34	-8.48	19.86	40.00	-20.14	-	-	QP
2	68.2635	27.71	-10.45	17.26	40.00	-22.74	-	-	QP
3	148.9174	30.02	-8.68	21.34	40.00	-18.66	-	-	QP
4	327.1553	29.48	-7.51	21.97	47.00	-25.03	-	-	QP
5	542.6103	30.54	-3.05	27.49	47.00	-19.51	-	-	QP
6	646.8217	31.84	-1.32	30.52	47.00	-16.48	-	-	QP



Test mode:	TM1	Polarity:	Vertical
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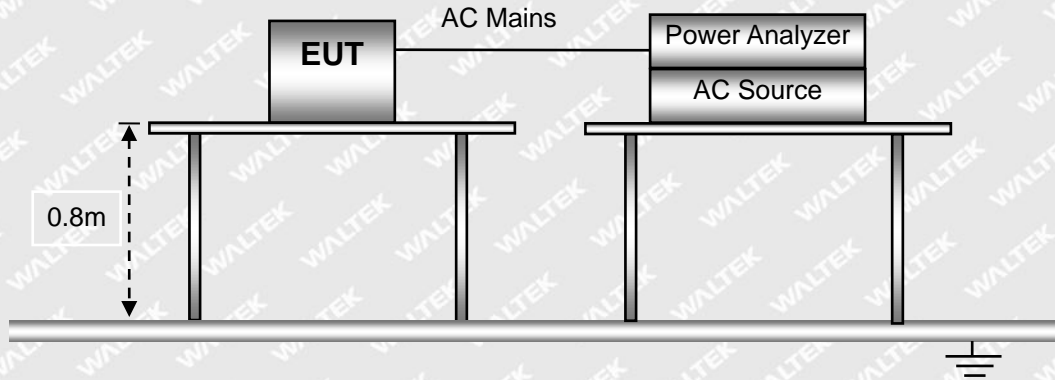
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	40.2993	29.03	-8.48	20.55	40.00	-19.45	-	-	QP
2	69.2296	29.56	-10.63	18.93	40.00	-21.07	-	-	QP
3	137.8399	29.26	-9.52	19.74	40.00	-20.26	-	-	QP
4	248.7317	29.70	-10.26	19.44	47.00	-27.56	-	-	QP
5	495.2379	31.42	-3.97	27.45	47.00	-19.55	-	-	QP
6	749.6761	31.87	-0.18	31.69	47.00	-15.31	-	-	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 Setup Block Diagram



5.2 Test Standards

EN IEC 61000-3-2, Clause 7.2 Limits for Class A equipment.

5.3 Environmental Conditions

Temperature:	26°C
Relative Humidity:	55%
ATM Pressure:	1015 mbar

5.4 Harmonic Current Emissions Test Data



Harmonics – Class-A

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/11/14

Start time: 10:10:49

End time: 10:13:30

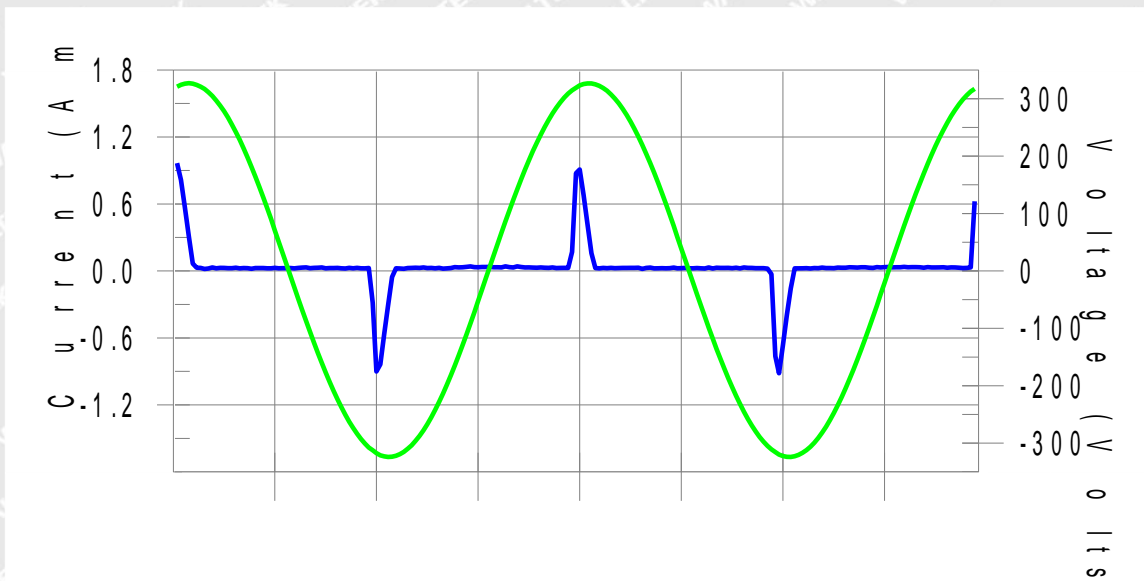
Test duration (min): 2.5

Data file name: H-000178.cts_data

Test Result: Pass

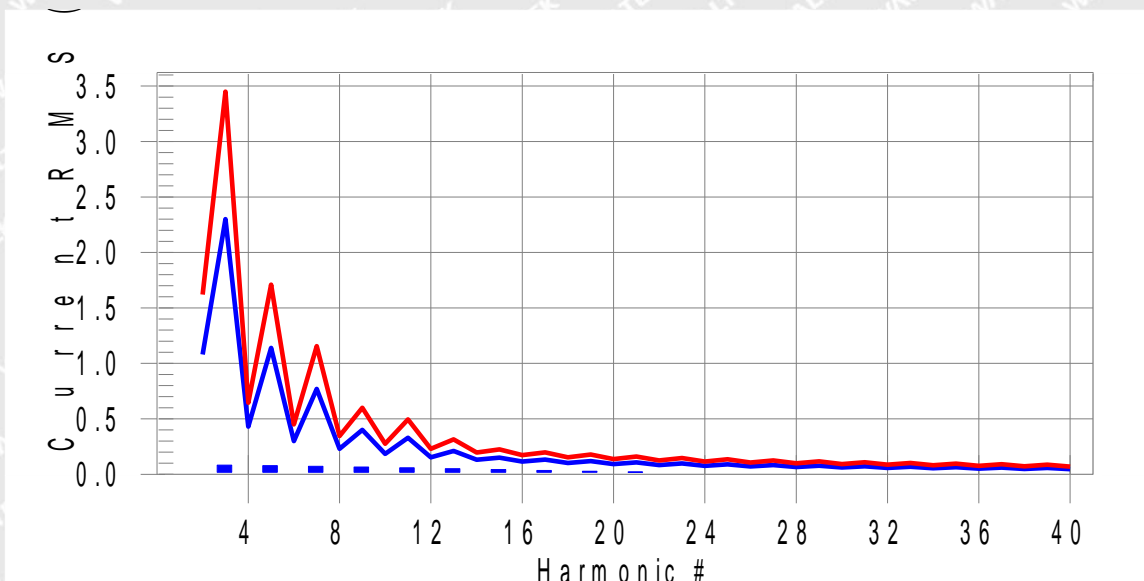
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-19.1% of 150% limit, H15-28.4% of 100% limit



Current Test Result Summary (Run time)

Test category: Class-A (European limits) Test Margin: 100
 Test date: 2023/11/14 Start time: 10:10:49 End time: 10:13:30
 Test duration (min): 2.5 Data file name: H-000178.cts_data

Test Result: Pass Source qualification: Normal
 THC(A): 0.184 I-THD(%): 216.1 POHC(A): 0.040 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.07 Frequency(Hz): 50.00
 I_Peak (Amps): 1.000 I_RMS (Amps): 0.207
 I_Fund (Amps): 0.085 Crest Factor: 4.881
 Power (Watts): 19.4 Power Factor: 0.411

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.002	1.620	N/A	Pass
3	0.082	2.300	3.6	0.084	3.450	2.4	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.078	1.140	6.9	0.079	1.710	4.6	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.073	0.770	9.5	0.074	1.155	6.4	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.066	0.400	16.6	0.067	0.600	11.2	Pass
10	0.001	0.184	N/A	0.002	0.276	N/A	Pass
11	0.059	0.330	17.8	0.059	0.495	12.0	Pass
12	0.001	0.153	N/A	0.002	0.230	N/A	Pass
13	0.051	0.210	24.2	0.051	0.315	16.3	Pass
14	0.001	0.131	N/A	0.002	0.197	N/A	Pass
15	0.043	0.150	28.4	0.043	0.225	19.1	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.035	0.132	26.2	0.035	0.198	17.6	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.027	0.118	23.1	0.028	0.178	15.6	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.021	0.107	19.8	0.022	0.161	13.4	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.016	0.098	16.8	0.017	0.147	11.4	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.013	0.090	15.0	0.014	0.135	10.2	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.012	0.083	14.4	0.012	0.125	9.9	Pass



Reference No.: WTF23X11233558W003

28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.011	0.078	14.8	0.012	0.116	10.1	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.011	0.073	15.3	0.011	0.109	10.5	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.011	0.068	15.5	0.011	0.102	10.6	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.010	0.064	15.1	0.010	0.096	10.2	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.008	0.061	13.9	0.009	0.091	9.5	Pass
38	0.000	0.048	N/A	0.001	0.073	N/A	Pass
39	0.007	0.058	12.3	0.007	0.087	8.3	Pass
40	0.000	0.046	N/A	0.001	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: 2023/11/14 **Start time: 10:10:49** **End time: 10:13:30**
Test duration (min): 2.5 **Data file name: H-000178.cts_data**

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms): 230.07	Frequency(Hz): 50.00
I_Peak (Amps): 1.000	I_RMS (Amps): 0.207
I_Fund (Amps): 0.085	Crest Factor: 4.881
Power (Watts): 19.4	Power Factor: 0.411

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.049	0.460	10.63	OK
3	0.520	2.071	25.10	OK
4	0.085	0.460	18.45	OK
5	0.056	0.920	6.09	OK
6	0.029	0.460	6.39	OK
7	0.037	0.690	5.33	OK
8	0.016	0.460	3.58	OK
9	0.041	0.460	8.93	OK
10	0.008	0.460	1.81	OK
11	0.044	0.230	19.15	OK
12	0.012	0.230	5.38	OK
13	0.040	0.230	17.55	OK
14	0.007	0.230	2.97	OK
15	0.042	0.230	18.29	OK
16	0.007	0.230	3.20	OK
17	0.027	0.230	11.73	OK
18	0.012	0.230	5.12	OK
19	0.035	0.230	15.27	OK
20	0.016	0.230	6.82	OK
21	0.028	0.230	12.10	OK
22	0.004	0.230	1.64	OK
23	0.023	0.230	9.84	OK
24	0.003	0.230	1.10	OK
25	0.018	0.230	7.91	OK
26	0.003	0.230	1.33	OK
27	0.022	0.230	9.40	OK
28	0.005	0.230	2.29	OK



Reference No.: WTF23X11233558W003

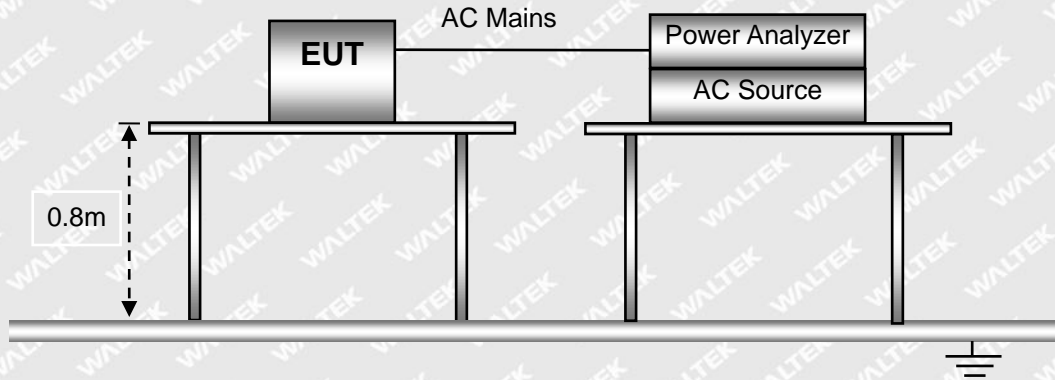
29	0.013	0.230	5.74	OK
30	0.004	0.230	1.55	OK
31	0.018	0.230	7.79	OK
32	0.003	0.230	1.23	OK
33	0.018	0.230	7.66	OK
34	0.003	0.230	1.26	OK
35	0.016	0.230	7.17	OK
36	0.003	0.230	1.26	OK
37	0.017	0.230	7.29	OK
38	0.003	0.230	1.38	OK
39	0.017	0.230	7.60	OK
40	0.008	0.230	3.65	OK

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6. Voltage Fluctuation and Flicker

6.1 Test Setup Block Diagram



6.2 Test Standards

EN 61000-3-3, Limit: Clause 5.

6.3 Environmental Conditions

Temperature:	26°C
Relative Humidity:	55%
ATM Pressure:	1015 mbar

6.4 Voltage Fluctuation and Flicker Test Data

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



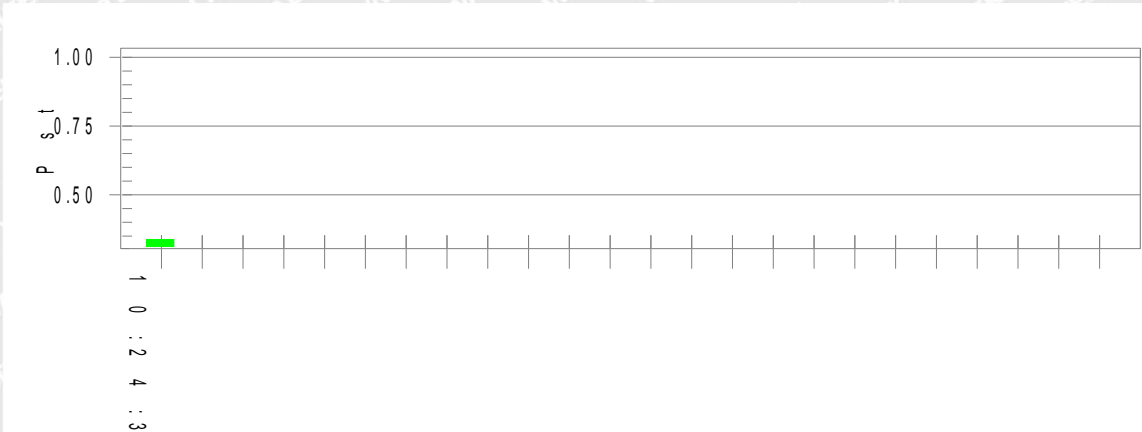
Test mode:	TM1
------------	-----

Test Result: Pass

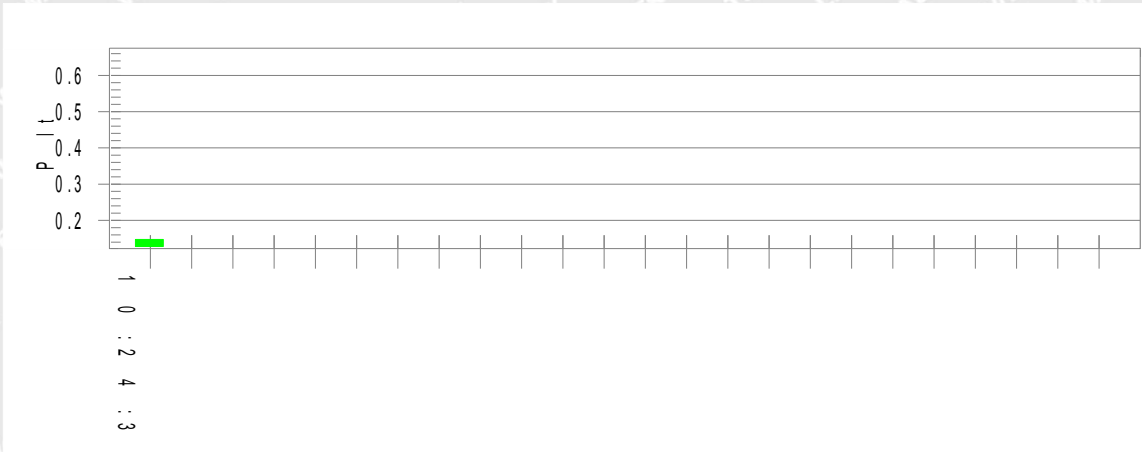
Status: Test Completed

Pst_t and limit line

European Limits



Plt and limit line



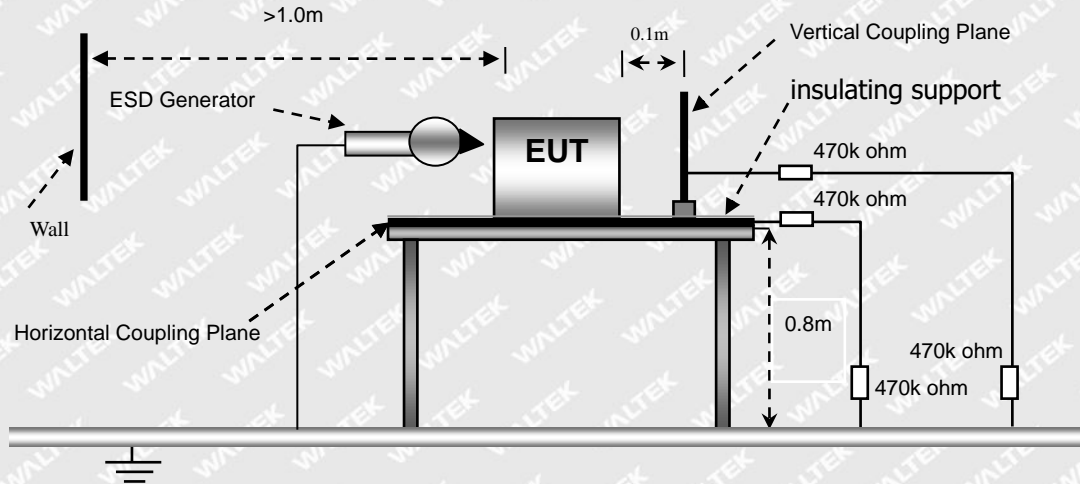
Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.97		
Highest dt (%):		Test limit (%):	
T-max (mS):	10	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	3.75	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.338	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.148	Test limit:	0.650 Pass



7. Electrostatic Discharge (ESD)

7.1 Test Setup Block Diagram



7.2 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM2
Note: TM2 for TT, TR	

7.3 Environmental Conditions

Temperature:	26°C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

7.4 Electrostatic Discharge Immunity Test Data



Test mode	TM1-TM2							
Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Type-C Port	A	A	A	A	A	A	B	B
Enclosure	A	A	A	A	A	A	A	A
Direct Contact Discharge								
Enclosure	A	A	B	B	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

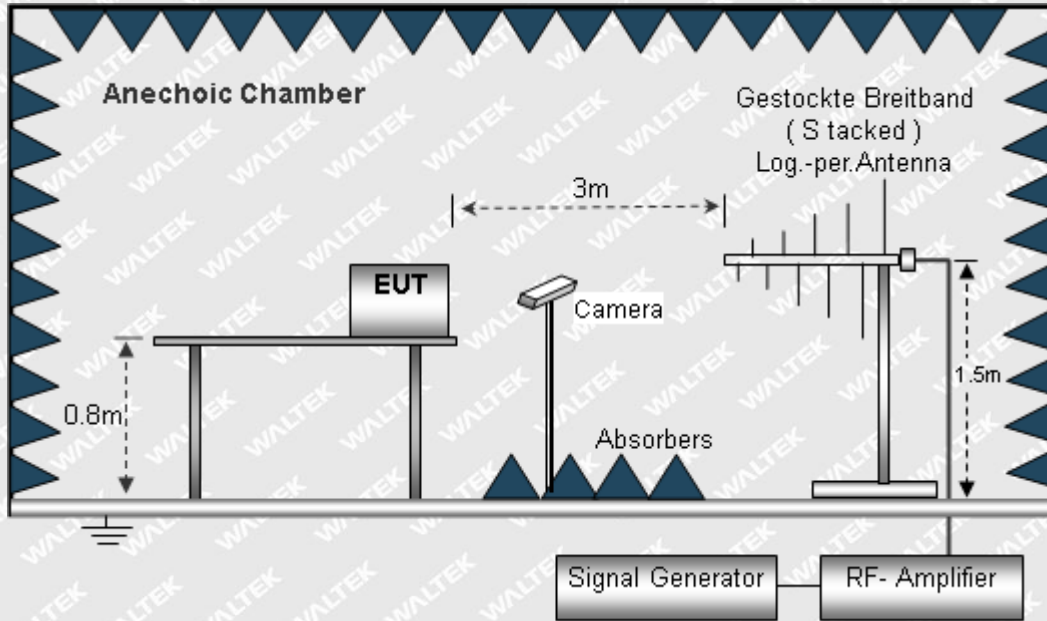
Test Result: Pass

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8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Setup Block Diagram



8.2 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM2
Note:TM2 for TT,TR	

8.3 Environmental Conditions

Temperature:	26°C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

8.4 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-TM2							
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

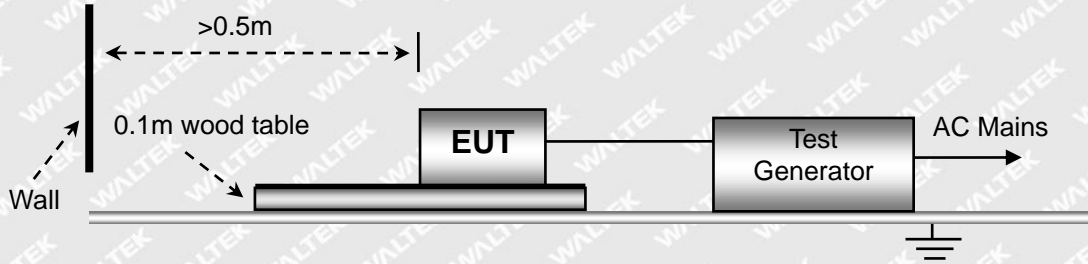
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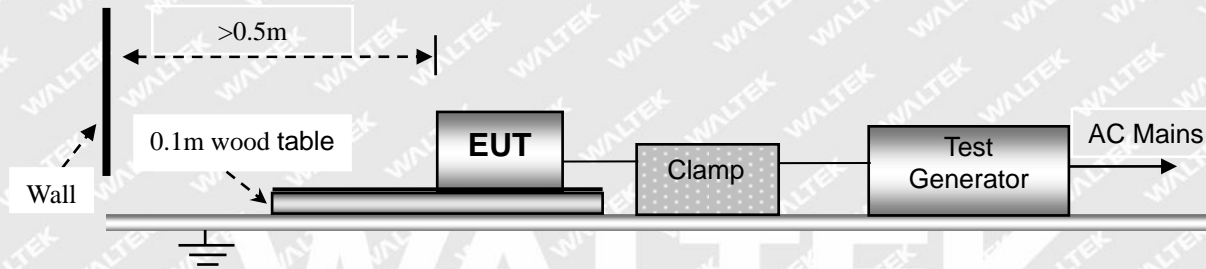
9. Fast Transients, Common Mode (EFT)

9.1 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



9.2 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM2
Note: TM2 for CT,CR	

9.3 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

9.4 Electrical Fast Transients Test Data



Test Mode		TM1-TM2							
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

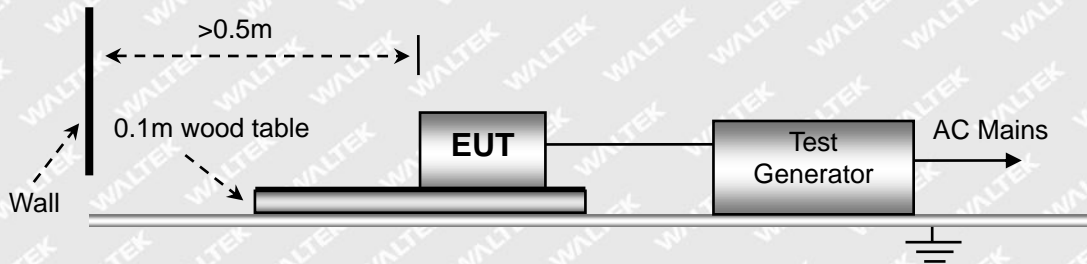
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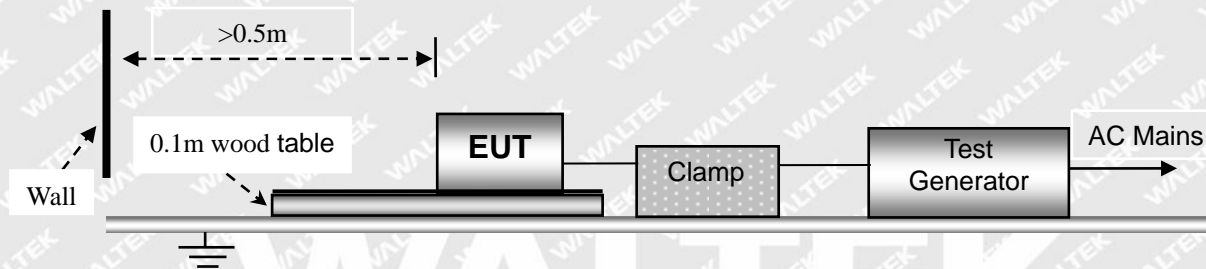
10. Surges

10.1 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



10.2 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM2
Note: TM2 for TT, TR	

10.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

10.4 Surge Test Data



Test Mode	TM1-TM2			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	/	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass

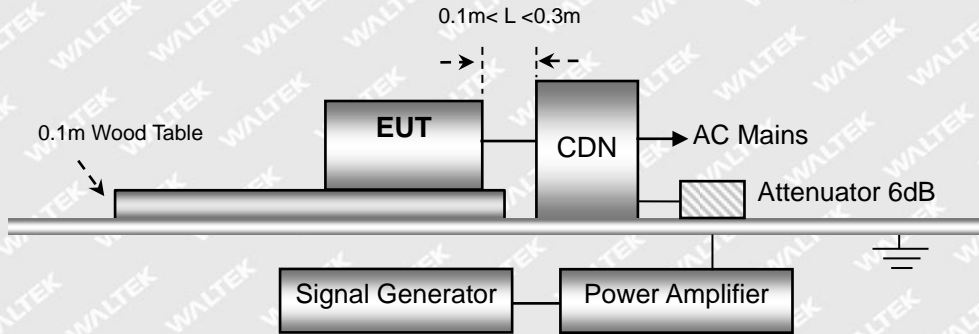
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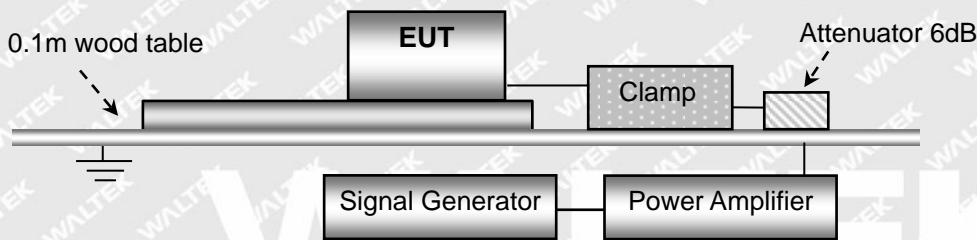
11. Radio Frequency, Common Mode (C/S)

11.1 Test Setup Block Diagram

For AC Mains or DC Input:



For Signal or Telecommunication Ports:



11.2 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM2
Note: TM2 for CT,CR	

11.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

11.4 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second



Test Mode		TM1-TM2		
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	/	/	/

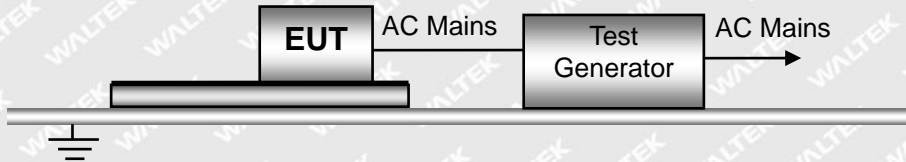
Test Result: Pass

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12. Voltage Dips and Interruptions

12.1 Test Setup Block Diagram



12.2 Test Performance

Required Performance Criterion:	B for voltage dip/ C for voltage interruption
Mode:	TM1-TM2
Note:TM2 for TT,TR	

12.3 Environmental Conditions

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

12.4 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	C	/

Test Result: Pass



EXHIBIT 1 - EUT PHOTOGRAPHS

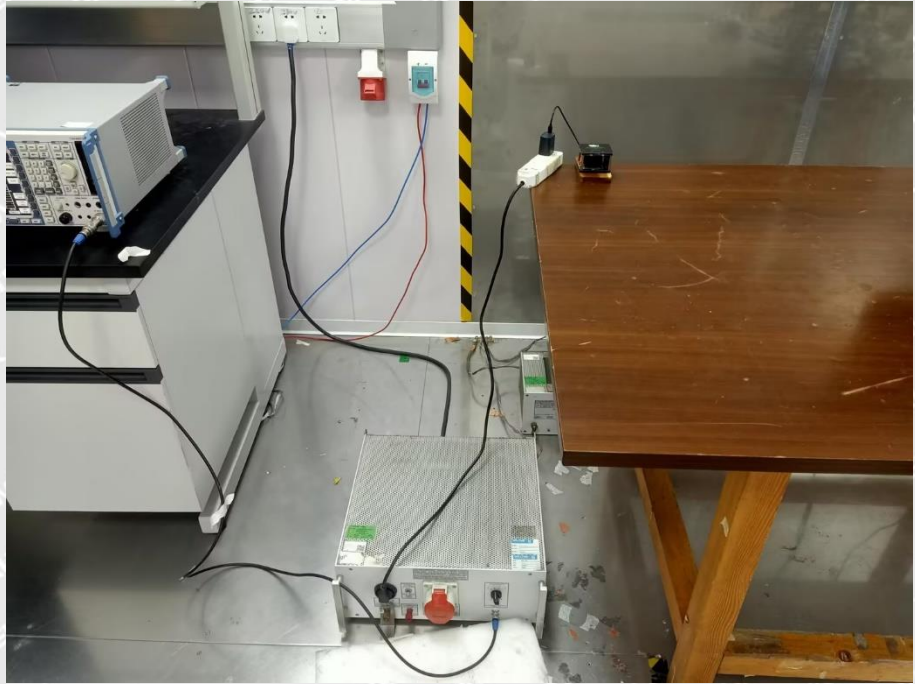
Please refer to "ANNEX".

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EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

**Conducted Emission
Test Setup**



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

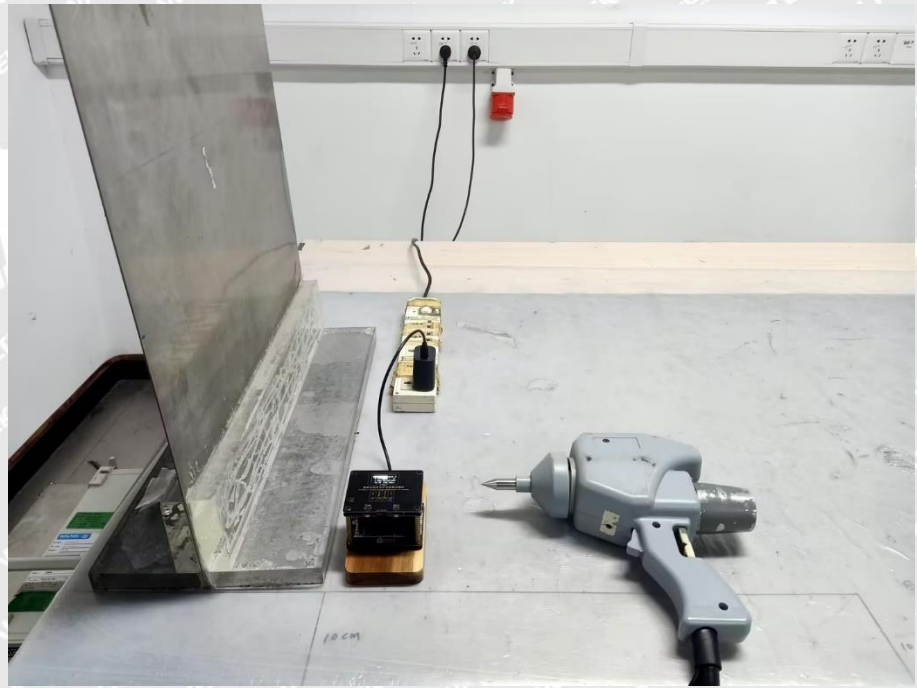




**Harmonic/Flicker Test
View**

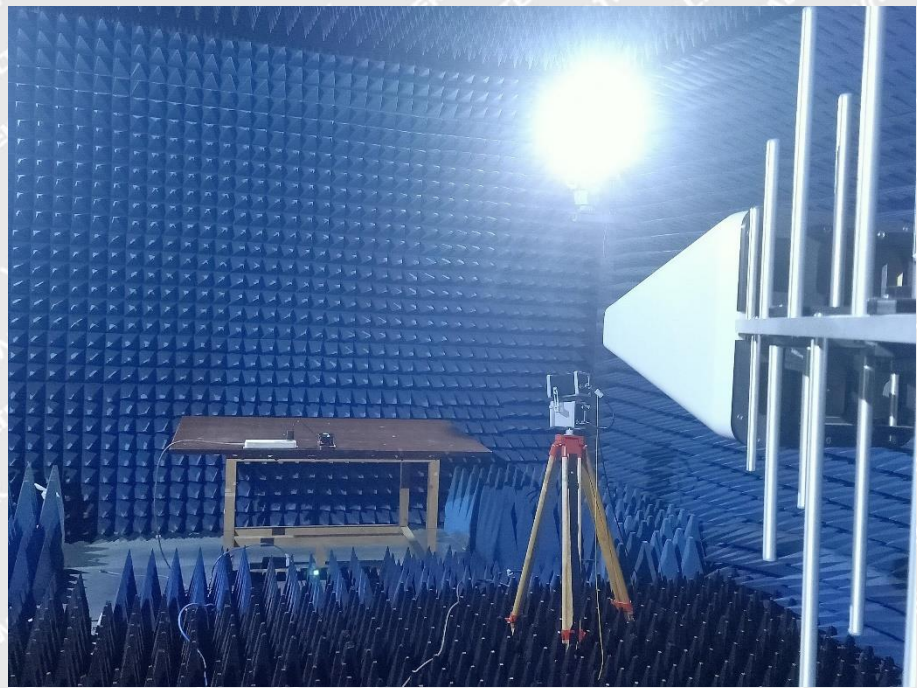


ESD Test View

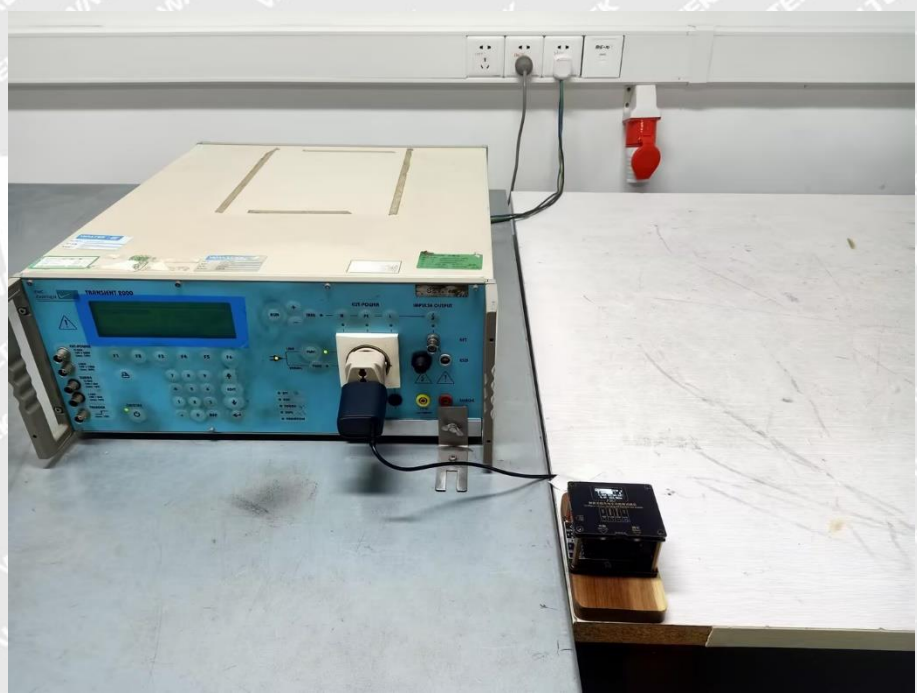




R/S Test View

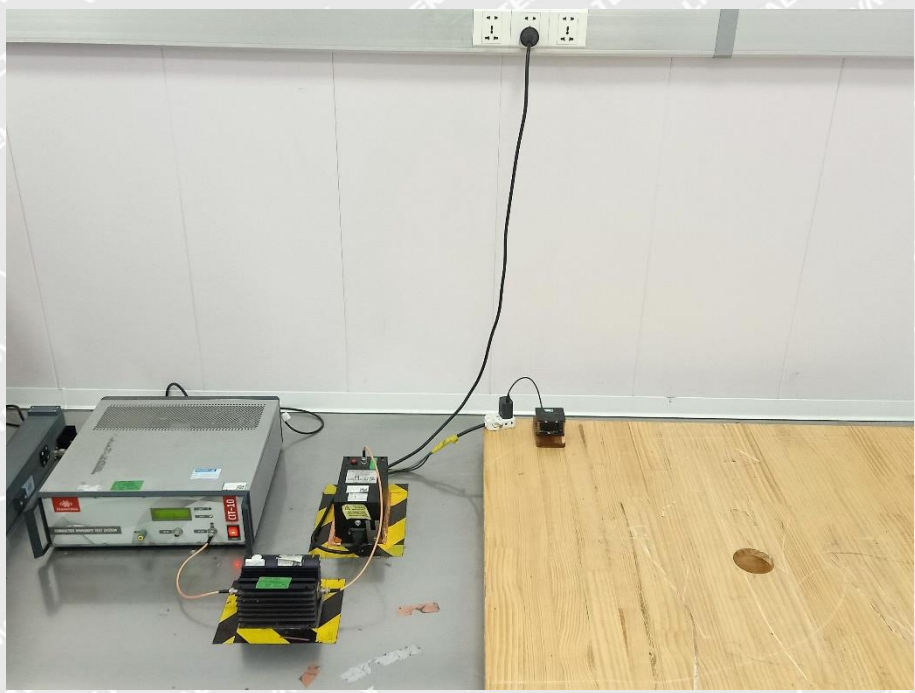


EFT/ Surges/ Dips and Interruptions Test View





CS Test View



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

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国际互认
检测
TESTING
CNAS L4062



TEST REPORT

Reference No...... : WTF23X11233558W004
Manufacturer : Mid Ocean Brands B.V.
Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory : 114538
Product Name : Wireless Powerbank
Model No...... : MQ2185
Standards : EN 55011:2016/A1:2017
EN IEC 61000-6-1:2019
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021
Date of Receipt sample : 2023-11-01
Date of Test..... : 2023-11-01 to 2023-11-24
Date of Issue : 2023-11-24
Test Report Form No. : WTX_EN 55011_2016_B
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.

Prepared By:

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

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:

Gala Wang

Approved by:

Silin Chen



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Report version

Version No.	Date of issue	Description
Rev.00	2023-11-24	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Wireless Powerbank
Trade Name:	/
Model No.:	MO2185
Adding Model(s):	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	Input(Type-C):DC5V,9V,12V Output(Type-C):DC5V,9V,12V Output(USB-A):DC5V,9V,12V
Rated Current:	/
Rated Power:	Output: 15W(MAX)
Power Adaptor Model:	/
Highest Internal Frequency:	Below 108MHz
Classification of Equipment:	Class B of Group 2
Wireless Charger Transmit Frequency Range:	110~205KHz



1.2 Test Standards

The tests were performed according to following standards:

EN IEC 61000-6-1:2019: Electromagnetic compatibility (EMC) —Part 6-1: Generic standards —Immunity for residential, commercial and light-industrial environments.

EN 55011:2016/A1:2017: Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement.

EN IEC 61000-3-2:2019+A1:2021: Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3:2013+A2:2021: Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

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 standards EN 55011, EN IEC 61000-3-2, EN 61000-3-3, and EN IEC 61000-6-1 for Industrial, scientific and medical equipment, and all related testing and measurement techniques intertional standards.



1.4 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	Power Supply Mode
TM1	Wireless Charging	Connect to the Adapter;	AC230V 60Hz for adapter, Wireless Charging (MAX OUTPUT)
Note: The product was measured at two nominal voltages of 230V and 110V, using a frequency of 50Hz or 60Hz. This report shows the worst case with 230V/50Hz data.			

EUT Cable List and Details				
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite	With / Without Chip
Type-C Cable	0.3	Unshielded	Without Ferrite	Without Chip

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Adapter	XIAOMI	MDY-11-EX	/



1.5 Performance Criteria for EMS

All the test data has been collected, reduced, and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacturer. No change in operating state or loss of data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

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1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
<input type="checkbox"/> Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1	/	/
<input type="checkbox"/> Chamber A: Above 1GHz					
Amplifier	C&D	PAP-1G18	2002	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1	/	/
<input type="checkbox"/> Chamber B: Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10457	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
EMI Test Software (Radiated Emission B)	Farad	EZ-EMC	RA-03A1	/	/
<input checked="" type="checkbox"/> Chamber C: Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2	/	/
<input type="checkbox"/> Chamber C: Above 1GHz					
Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2	/	/
<input type="checkbox"/> Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24



Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
8-WIRE ISN	Schwarz beck	8158	CAT3-8158-0059	2023-02-25	2024-02-24
8-WIRE ISN	Schwarz beck	8158	CAT5-8158-0117	2023-02-25	2024-02-24
EMI Test Software (Conducted Emission Room 1#)	Farad	EZ-EMC	RA-03A1	/	/
<input checked="" type="checkbox"/> Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24
LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24
EMI Test Software (Conducted Emission Room 2#)	SKET	EMC-I	V2.0	/	/
<input type="checkbox"/> Harmonics &Flicker					
Digital Power Analyzer	California Instrument	CTS	72831	2023-02-25	2024-02-24
Power Source	California Instrument	5001IX-CTS-400	60077	2023-02-25	2024-02-24
Test Software (Harmonics &Flicker)	AMETEK	CTS4	4.30	/	/
<input checked="" type="checkbox"/> Electrostatic discharges					
ESD Generator	LIONCEL	ESD-203B	0170901	2023-03-14	2024-03-13
<input checked="" type="checkbox"/> Power-frequency magnetic field (PFMF)					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2023-02-25	2024-02-24
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2023-02-25	2024-02-24
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Electronic fast transient(EFT)/Surges/Dips					
Transient 2000	EMC PARTNER	TRA2000	836	2023-02-25	2024-02-24
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Radio frequency, continuous conducted (C/S)					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2023-02-25	2024-02-24
Attenuator	EMTEST	MA-5100/6BF2	1009	2023-02-25	2024-02-24
CDN	Luthi	L-801M2/M3	2665	2023-02-25	2024-02-24
CDN	LIONCEL	CDN-T8	0210401	2023-02-25	2024-02-24
EM Clamp	TESEQ	KEMZ801A	45028	2023-02-25	2024-02-24
Test Software (Radio frequency, Continuous)	SKET	EMC-S	V1.4.0.16	/	/



conducted)					
<input checked="" type="checkbox"/> Radio frequency electromagnetic Field (R/S)					
Signal Generator	HP	8665B	3438A00604	2023-02-25	2024-02-24
Power Sensor	Agilent	E9301A	MY52450001	2023-02-25	2024-02-24
Power Sensor	Agilent	E9304A	MY55081055	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-1000-250	MPA1906239	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-1000-6000-100	MPA1906238	2023-02-25	2024-02-24
Power Meter	Agilent	E4419B	GB42420578	2023-02-25	2024-02-24
Test Software (Radio frequency electromagnetic Field)	EMtrace	EM3	V1.2.4	/	/

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2. SUMMARY OF TEST RESULTS

Standards	Description of Test Item	Result
EN 55011	Conducted Emission	Compliant
	Radiated Emission	Compliant
EN IEC 61000-3-2	Harmonic Current Emission	Compliant
EN 61000-3-3	Voltage Fluctuation and Flicker	Compliant
EN IEC 61000-6-1	Electrostatic Discharge Immunity	Compliant
	Continuous RF electromagnetic field Disturbances Immunity	Compliant
	Electrical Fast Transient/Burst Immunity	Compliant
	Surges Immunity	Compliant
	Continuous induced RF disturbances Immunity	Compliant
	Power-frequency Magnetic Fields Immunity	Compliant
	Voltage Dips/Interruptions Immunity	Compliant

N/A: not applicable

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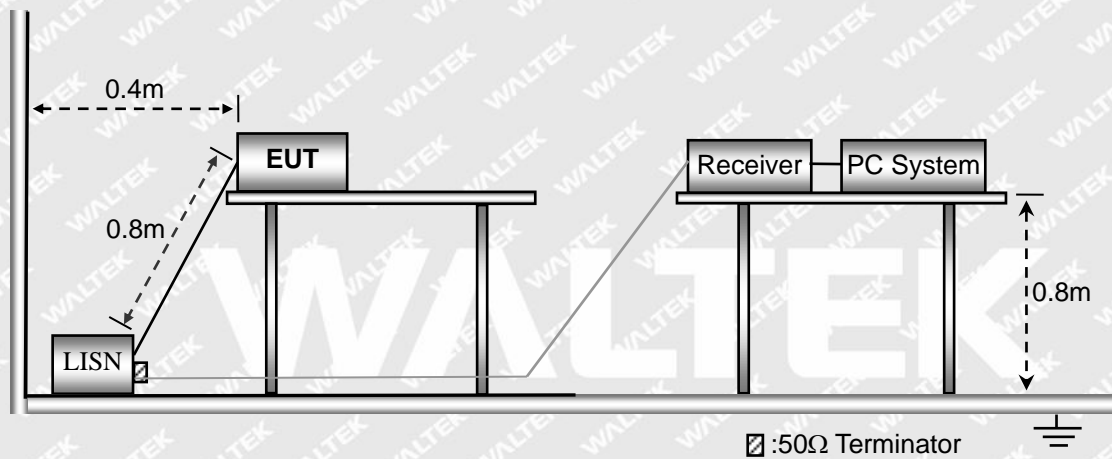
3. Conducted Emission

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement:

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz ± 3.74 dB
		0.15-30MHz ± 3.34 dB

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

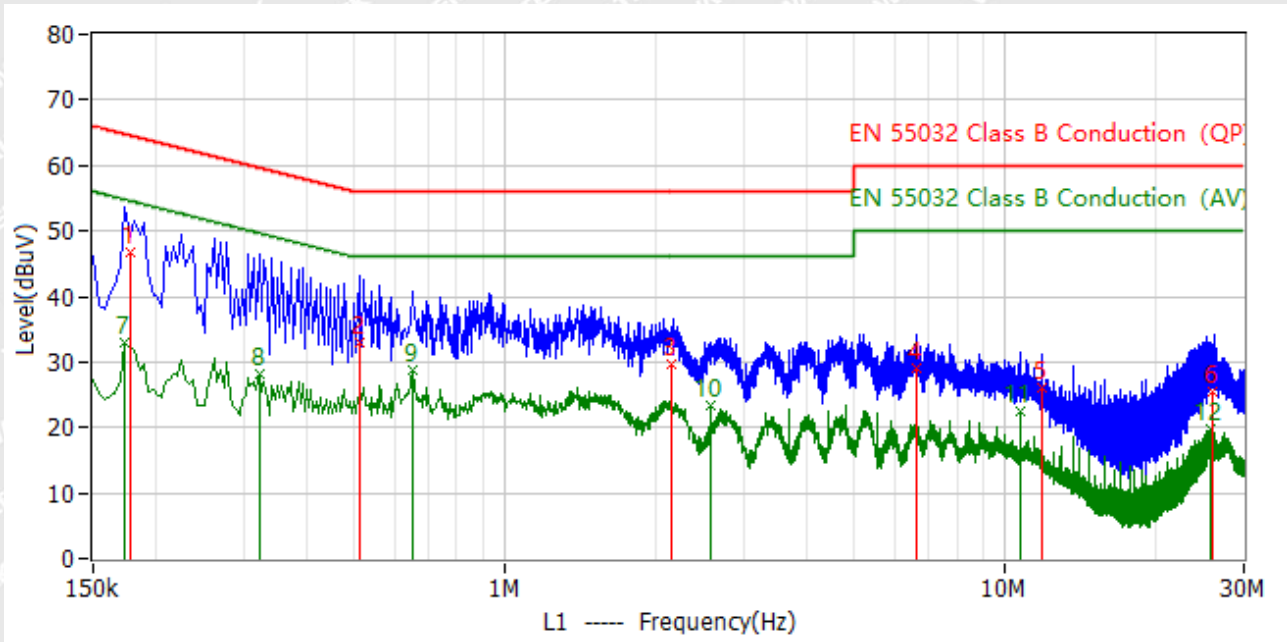
Temperature:	25°C
Relative Humidity:	45
ATM Pressure:	1015 mbar

3.4 Summary of Test Results

Please find the results below:



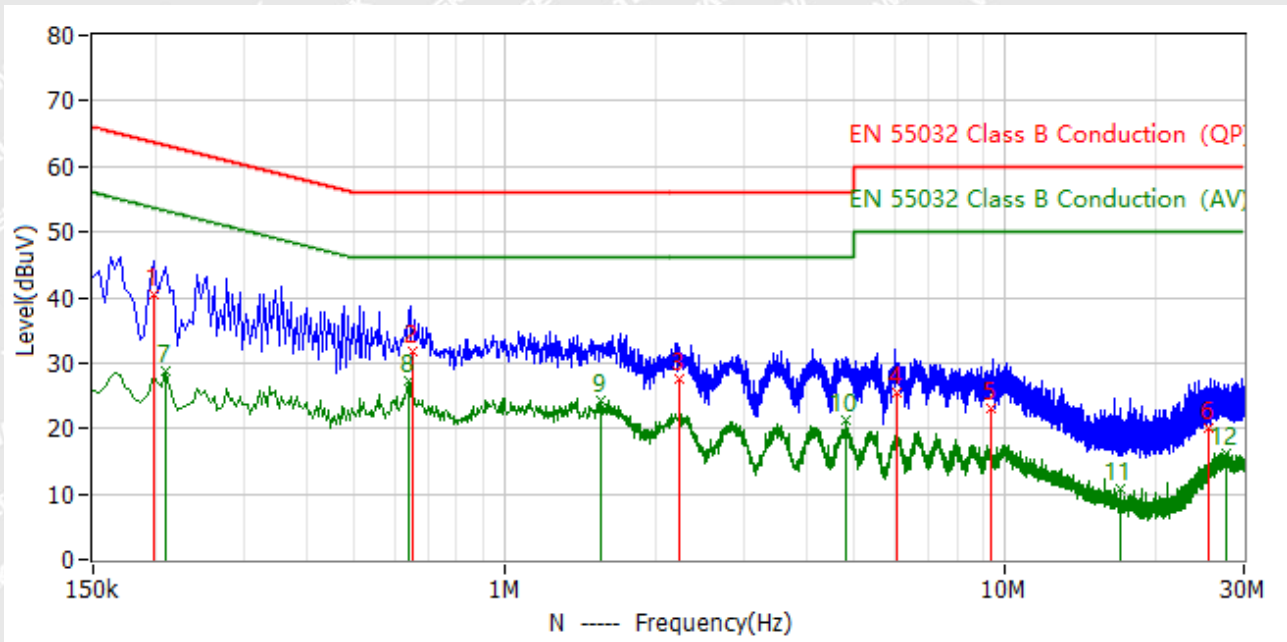
Test mode:	TM1	Polarity:	Line
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	178.000kHz	26.0	20.8	46.8	64.6	-17.8	QP
2	514.000kHz	12.3	20.7	33.0	56.0	-23.0	QP
3	2.154MHz	9.0	20.8	29.8	56.0	-26.2	QP
4	6.638MHz	8.3	20.7	29.0	60.0	-31.0	QP
5	11.794MHz	5.4	20.8	26.2	60.0	-33.8	QP
6	25.954MHz	5.3	20.2	25.5	60.0	-34.5	QP
7*	174.000kHz	12.1	20.8	32.9	54.8	-21.9	AV
8*	322.000kHz	8.0	20.3	28.3	49.7	-21.4	AV
9*	654.000kHz	8.1	20.7	28.8	46.0	-17.2	AV
10*	2.582MHz	2.6	20.9	23.5	46.0	-22.5	AV
11*	10.698MHz	1.6	20.8	22.4	50.0	-27.6	AV
12*	25.730MHz	-0.4	20.2	19.8	50.0	-30.2	AV



Test mode:	TM1	Polarity:	Neutral
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No.	Frequency	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Delta dB	Detector
1	198.000kHz	19.8	20.6	40.4	63.7	-23.2	QP
2	654.000kHz	11.2	20.7	31.9	56.0	-24.1	QP
3	2.226MHz	6.8	20.8	27.6	56.0	-28.4	QP
4	6.078MHz	4.6	20.8	25.4	60.0	-34.6	QP
5	9.338MHz	2.3	20.8	23.1	60.0	-36.9	QP
6	25.602MHz	-0.2	20.2	20.0	60.0	-40.0	QP
7*	210.000kHz	8.1	20.6	28.7	53.2	-24.5	AV
8*	642.000kHz	6.6	20.7	27.3	46.0	-18.7	AV
9*	1.558MHz	3.4	20.8	24.2	46.0	-21.8	AV
10*	4.798MHz	0.4	20.9	21.3	46.0	-24.7	AV
11*	16.970MHz	-9.6	20.4	10.8	50.0	-39.2	AV
12*	27.734MHz	-4.2	20.4	16.2	50.0	-33.8	AV



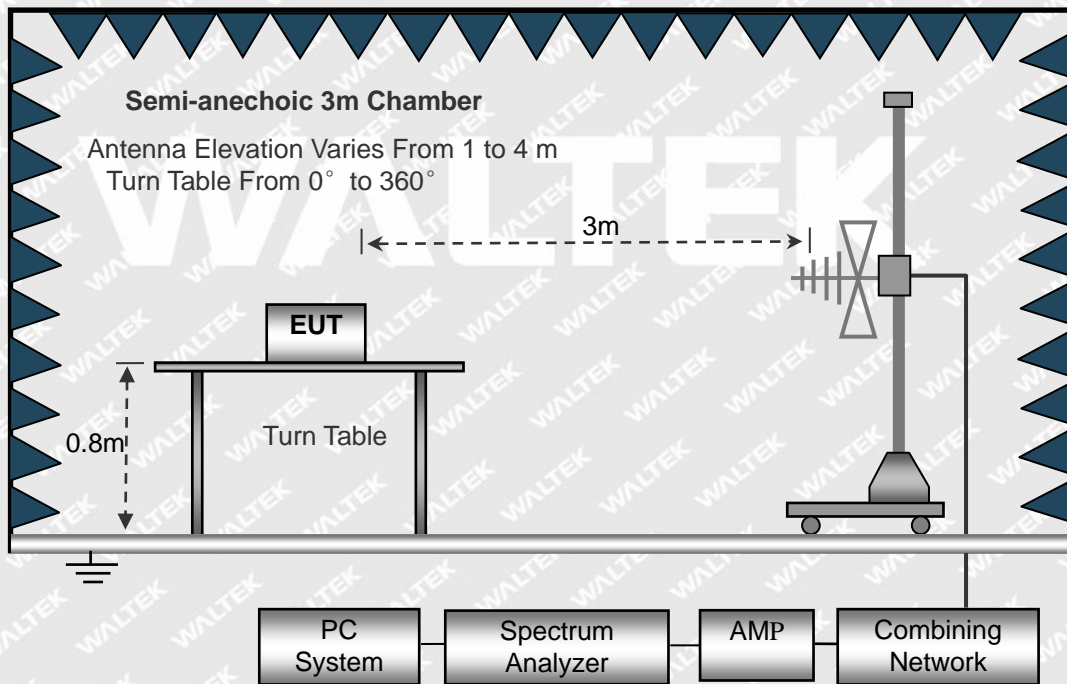
4. Radiated Emission

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement:

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Radiated Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$

4.2 Basic Test Setup Block Diagram





4.3 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Correct Correct} = \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 55011 Limit}$$

4.4 Environmental Conditions

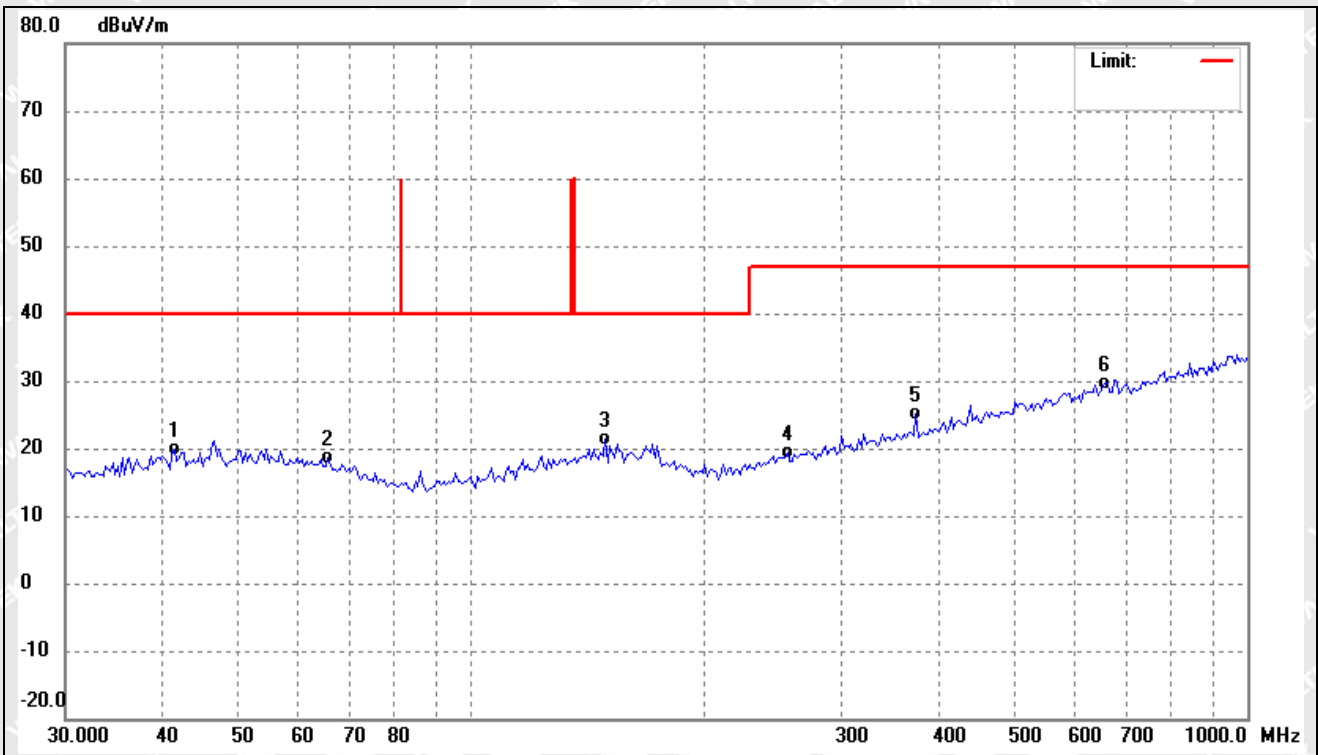
Temperature:	25°C
Relative Humidity:	51%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results

Please find the results below:



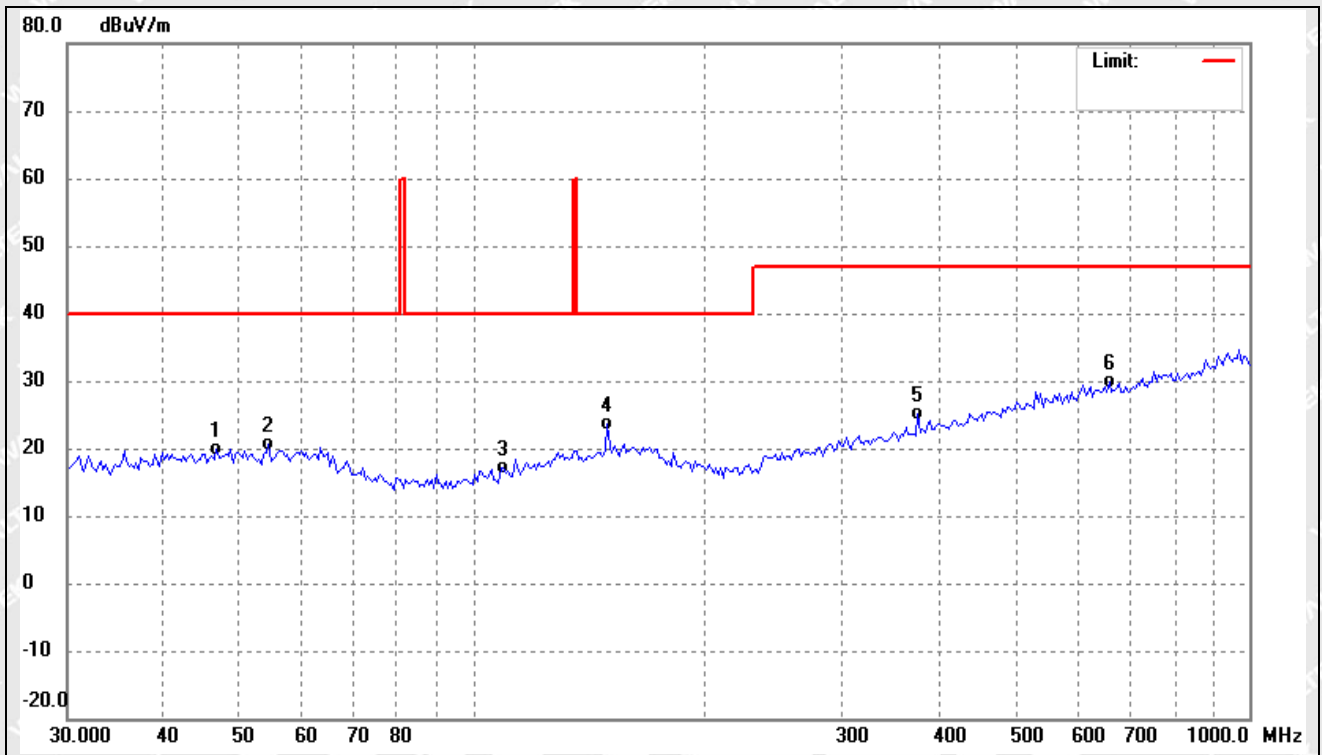
Test mode:	TM1	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	41.4483	28.33	-8.48	19.85	40.00	-20.15	-	-	QP
2	65.4452	28.44	-9.93	18.51	40.00	-21.49	-	-	QP
3	148.9174	29.97	-8.68	21.29	40.00	-18.71	-	-	QP
4	255.8226	29.46	-9.96	19.50	47.00	-27.50	-	-	QP
5	373.8861	31.53	-6.50	25.03	47.00	-21.97	-	-	QP
6	655.9765	30.90	-1.30	29.60	47.00	-17.40	-	-	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	46.7077	28.30	-8.34	19.96	40.00	-20.04	-	-	QP
2	54.5166	29.17	-8.57	20.60	40.00	-19.40	-	-	QP
3	109.3109	28.79	-11.64	17.15	40.00	-22.85	-	-	QP
4	148.9174	32.42	-8.68	23.74	40.00	-16.26	-	-	QP
5	373.8861	31.66	-6.50	25.16	47.00	-21.84	-	-	QP
6	660.6024	31.24	-1.28	29.96	47.00	-17.04	-	-	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

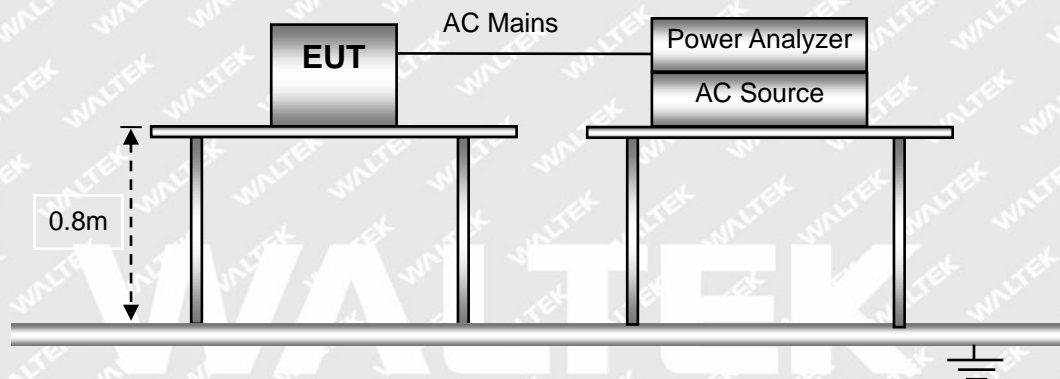
5.1 Test Standards

EN IEC 61000-3-2, Clause 7.2 Limits for Class A equipment.

5.2 Environmental Conditions

Temperature:	25°C
Relative Humidity:	51 %
ATM Pressure:	1022 mbar

5.3 Basic Test Setup Block Diagram



5.4 Harmonic Current Emissions Test Data



Harmonics – Class-A

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/11/16

Start time: 14:27:56

End time: 14:30:38

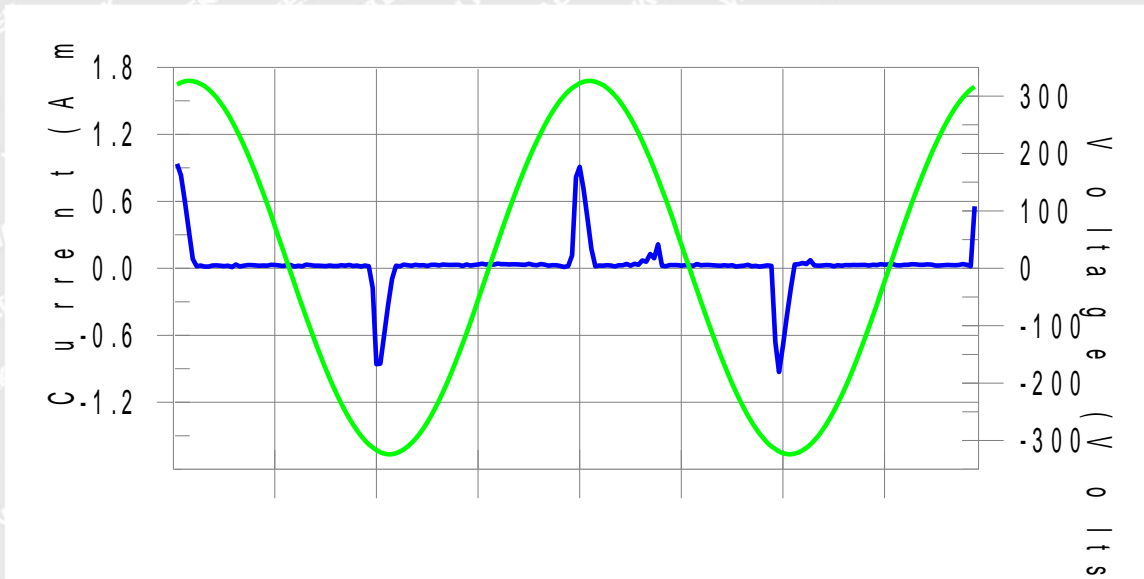
Test duration (min): 2.5

Data file name: H-000212.cts_data

Test Result: Pass

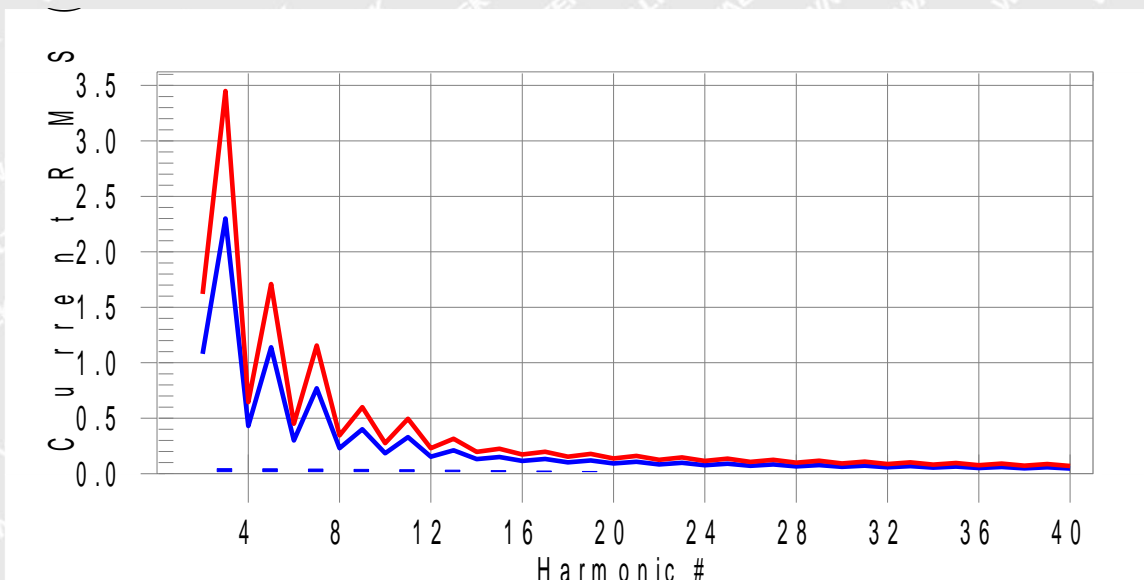
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-19.1% of 150% limit, H15-18.9% of 100% limit



Current Test Result Summary (Run time)

Test category: Class-A (European limits) Test Margin: 100
 Test date: 2023/11/16 Start time: 14:27:56 End time: 14:30:38
 Test duration (min): 2.5 Data file name: H-000212.cts_data

Test Result: Pass Source qualification: Normal
 THC(A): 0.112 I-THD(%): 132.2 POHC(A): 0.033 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.07 Frequency(Hz): 50.00
 I_Peak (Amps): 1.520 I_RMS (Amps): 0.211
 I_Fund (Amps): 0.085 Crest Factor: 15.516
 Power (Watts): 19.4 Power Factor: 0.411

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	0.046	2.300	2.0	0.084	3.450	2.4	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.045	1.140	3.9	0.080	1.710	4.7	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.042	0.770	5.5	0.074	1.155	6.4	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.039	0.400	9.8	0.067	0.600	11.2	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.036	0.330	10.9	0.060	0.495	12.1	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.032	0.210	15.3	0.052	0.315	16.4	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.028	0.150	18.9	0.043	0.225	19.1	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.024	0.132	18.5	0.035	0.198	17.7	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.021	0.118	17.5	0.028	0.178	15.7	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.017	0.107	16.2	0.022	0.161	13.6	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.014	0.098	14.8	0.017	0.147	11.7	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.012	0.090	13.5	0.014	0.135	10.3	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.010	0.083	12.5	0.013	0.125	10.0	Pass



Reference No.: WTF23X11233558W004

28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.009	0.078	11.8	0.012	0.116	10.3	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.008	0.073	11.1	0.012	0.109	10.6	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.007	0.068	10.5	0.011	0.102	10.8	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.006	0.064	9.7	0.010	0.096	10.4	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.005	0.061	8.9	0.009	0.091	9.6	Pass
38	0.000	0.048	N/A	0.001	0.073	N/A	Pass
39	0.005	0.058	N/A	0.007	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	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: 2023/11/16 **Start time: 14:27:56** **End time: 14:30:38**
Test duration (min): 2.5 **Data file name: H-000212.cts_data**

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms): 230.07	Frequency(Hz): 50.00
I_Peak (Amps): 1.520	I_RMS (Amps): 0.211
I_Fund (Amps): 0.085	Crest Factor: 15.516
Power (Watts): 19.4	Power Factor: 0.411

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.056	0.460	12.28	OK
3	0.523	2.070	25.25	OK
4	0.090	0.460	19.50	OK
5	0.061	0.920	6.60	OK
6	0.036	0.460	7.79	OK
7	0.039	0.690	5.72	OK
8	0.024	0.460	5.30	OK
9	0.044	0.460	9.48	OK
10	0.012	0.460	2.67	OK
11	0.044	0.230	18.92	OK
12	0.015	0.230	6.67	OK
13	0.040	0.230	17.58	OK
14	0.011	0.230	4.73	OK
15	0.043	0.230	18.61	OK
16	0.011	0.230	4.99	OK
17	0.028	0.230	12.17	OK
18	0.015	0.230	6.31	OK
19	0.035	0.230	15.36	OK
20	0.018	0.230	7.64	OK
21	0.030	0.230	12.93	OK
22	0.009	0.230	3.91	OK
23	0.024	0.230	10.61	OK
24	0.010	0.230	4.28	OK
25	0.023	0.230	10.16	OK
26	0.009	0.230	3.88	OK
27	0.022	0.230	9.57	OK
28	0.010	0.230	4.21	OK



Reference No.: WTF23X11233558W004

29	0.020	0.230	8.70	OK
30	0.010	0.230	4.43	OK
31	0.020	0.230	8.80	OK
32	0.009	0.230	3.84	OK
33	0.020	0.230	8.63	OK
34	0.010	0.230	4.21	OK
35	0.020	0.230	8.63	OK
36	0.009	0.230	3.89	OK
37	0.020	0.230	8.56	OK
38	0.010	0.230	4.32	OK
39	0.019	0.230	8.05	OK
40	0.011	0.230	4.77	OK

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6. Voltage Fluctuation Flicker

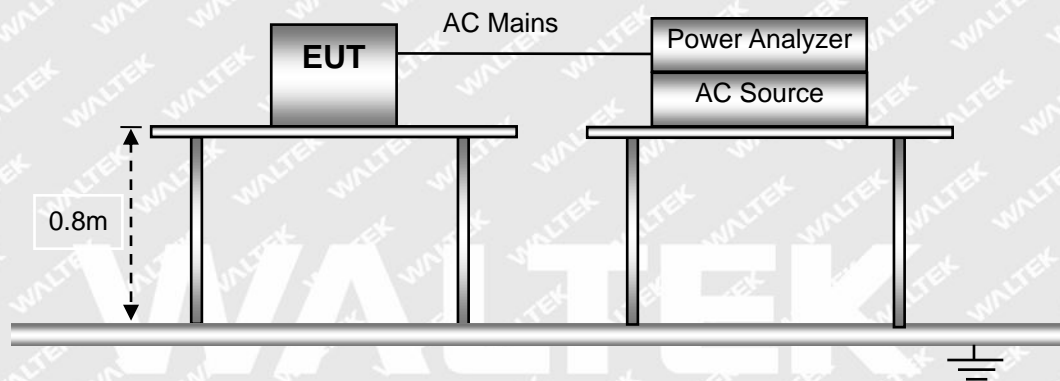
6.1 Test Standards

EN 61000-3-3, Limit: Clause 5.

6.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1022 mbar

6.3 Basic Test Setup Block Diagram



6.4 Voltage Fluctuation and Flicker Test Data



Test mode:	TM1
------------	-----

Test Result: Pass

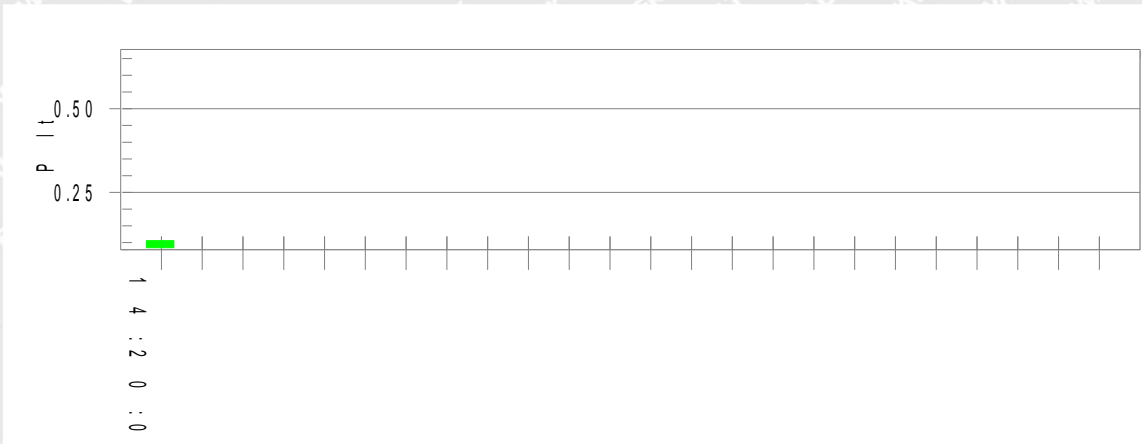
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.97

Highest dt (%):

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.242

Highest Plt (2 hr. period): 0.106

Test limit (%):

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass

Test limit: 0.650 Pass



7. Electrostatic Discharges (ESD)

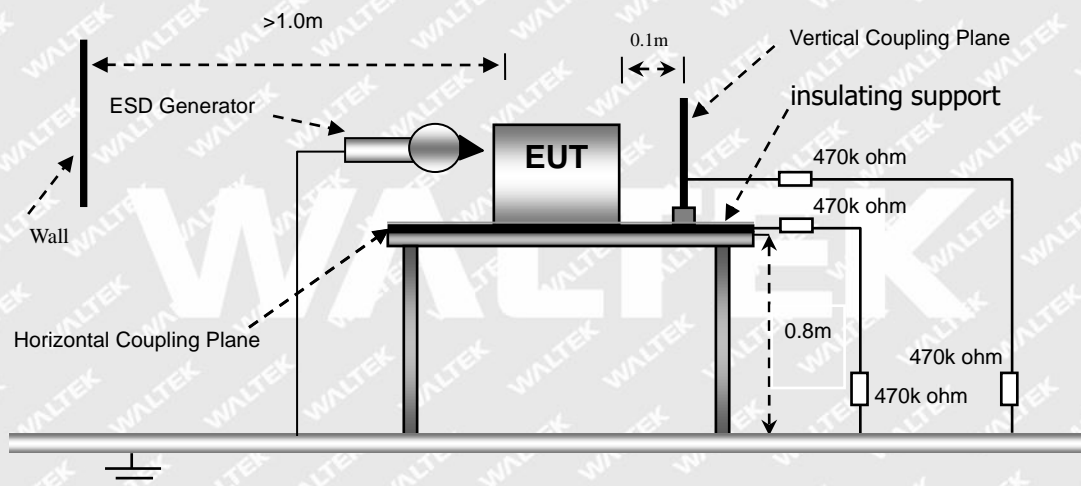
7.1 Test Performance

Performance Criterion: B

7.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1011 mbar

7.3 Basic Test Setup Block Diagram





7.4 Electrostatic Discharge Immunity Test Data

Test Mode:TM1

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points	Test Voltage (kV)									
	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
Type-C Port	A	A	A	A	A	A	B	B	/	/
Enclosure	A	A	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points	Test Voltage (kV)									
	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
Enclosure	A	A	B	B	/	/	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP & VCP)

Test Points	Test Voltage (kV)									
	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
HCP (6 Sides)	A	A	A	A	/	/	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/	/	/

Test Result: Pass

8. Continuous RF Electromagnetic Field Disturbances (RS)

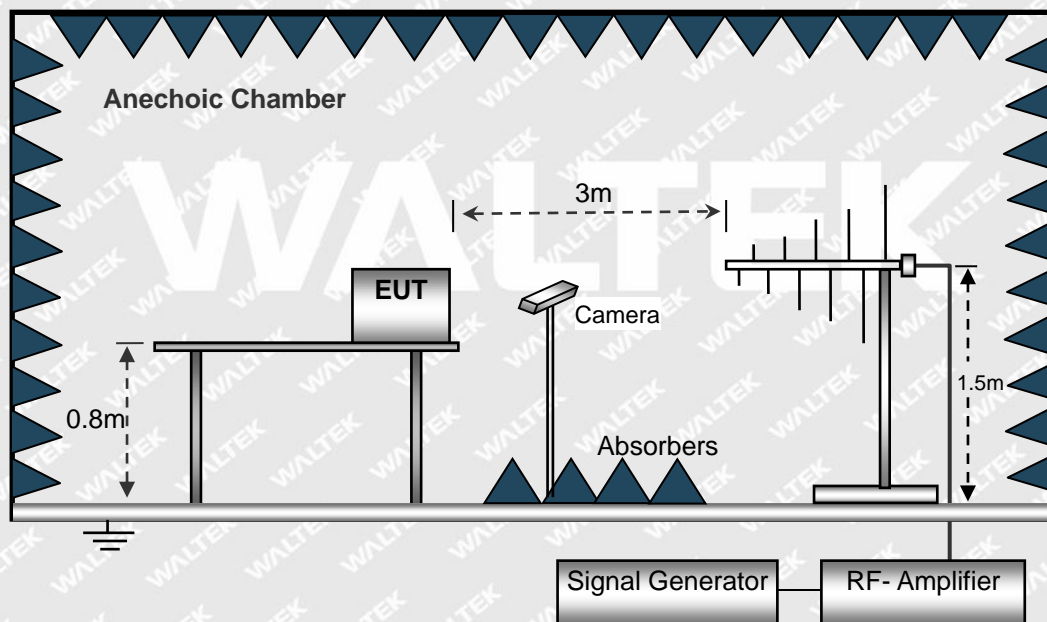
8.1 Test Performance

Performance Criterion: A

8.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1010 mbar

8.3 Basic Test Setup Block Diagram





8.4 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

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
1400-6000	3	A	A	A	A	A	A	A	A

Test Result: Pass

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9. Electrical Fast Transients (EFT)

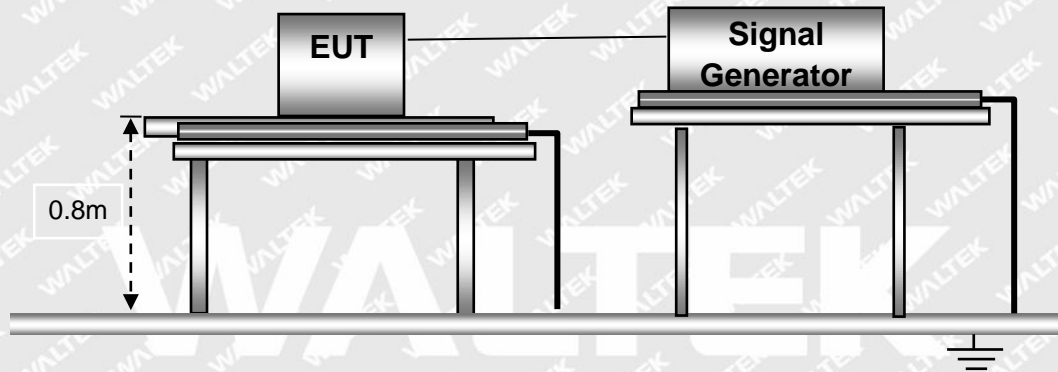
9.1 Test Performance

Performance Criterion: B

9.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1011 mbar

9.3 Basic Test Setup Block Diagram





9.4 Electrical Fast Transients Test Data

Test Mode:TM1

Test Points		Test Voltage (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
Power Supply Power Port of EUT	L	A	A	A	A	A	/	/	/
	N	A	A	A	A	A	/	/	/
	PE	/	/	/	/	/	/	/	/
	L+N	A	A	A	A	A	/	/	/
	L+PE	/	/	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/	/	/
	L+N+PE	/	/	/	/	/	/	/	/
Signal ports	RJ45	/	/	/	/	/	/	/	/

Test Result: Pass

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10. Surges

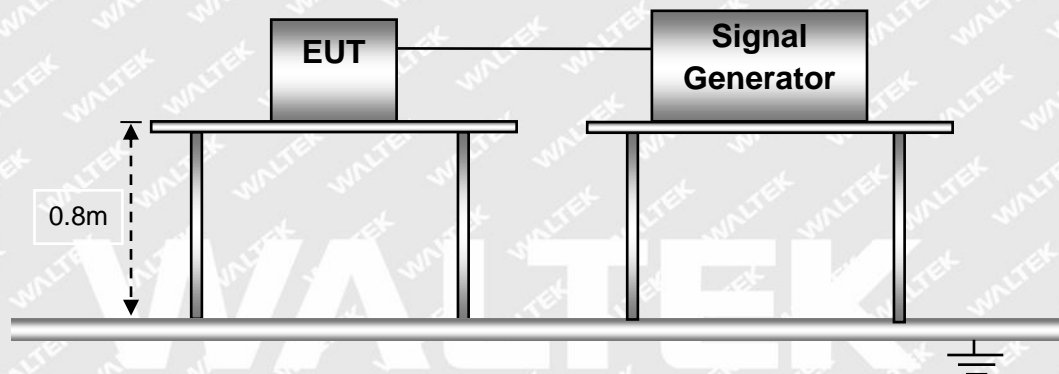
10.1 Test Performance

Performance Criterion: B

10.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1011 mbar

10.3 Basic Test Setup Block Diagram



10.4 Surge Test Data

Test Mode: TM1

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

Test Result: Pass



11. Continuous Induced RF Disturbances (C/S)

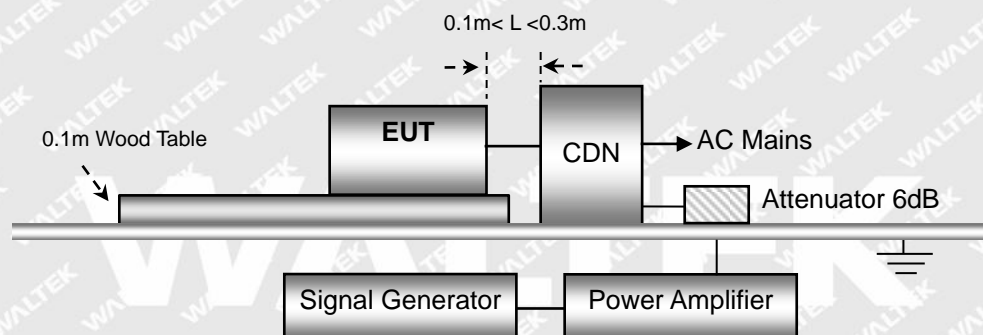
11.1 Test Performance

Performance Criterion: A

11.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1011 mbar

11.3 Basic Test Setup Block Diagram





11.4 Continuous Conducted Disturbances Test Data

Sweep frequency range: 0.15 MHz to 80 MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Test Mode: TM1

AC Port

Frequency MHz	Injected Position	Voltage level (e.m.f.)	Observations (Performance Criterion)	Result
0.15-80	AC Mains	1V	/	/
0.15-80	AC Mains	3V	A	Pass
0.15-80	AC Mains	10V	/	/

Test Result: Pass

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12. Power-Frequency Magnetic Fields (PFMF)

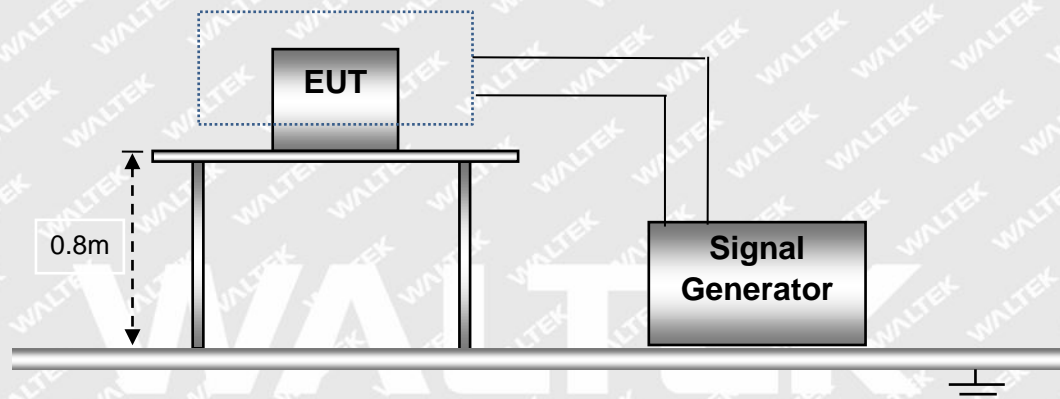
12.1 Test Performance

Performance Criterion: A

12.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51%
ATM Pressure:	1011 mbar

12.3 Basic Test Setup Block Diagram



12.4 Power-Frequency Magnetic Field Test Data

Test Mode: TM1

Level	Magnetic Field Strength (r.m.s) A/m	Frequency Hz	Induction Coil Position	Pass	Fail
1	1	50/60	X, Y, Z	/	/
2	3	50/60	X, Y, Z	A	/
3	10	50/60	X, Y, Z	/	/
X	Special	/	/	/	/

Test Result: Pass



13. Voltage Dips and Interruptions

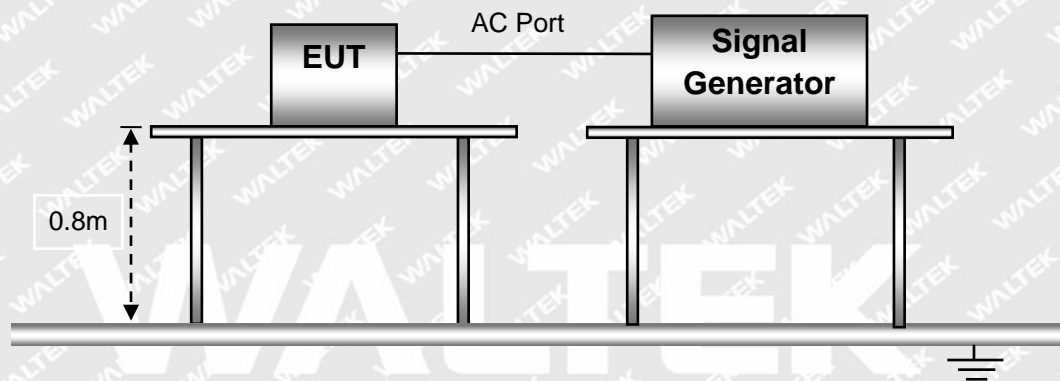
13.1 Test Performance

Performance Criterion: B/C

13.2 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	51 %
ATM Pressure:	1011 mbar

13.3 Basic Test Setup Block Diagram



13.4 Voltage Dips And Interruptions Test Data

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

T: Test duration

Test Mode: TM1

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)**

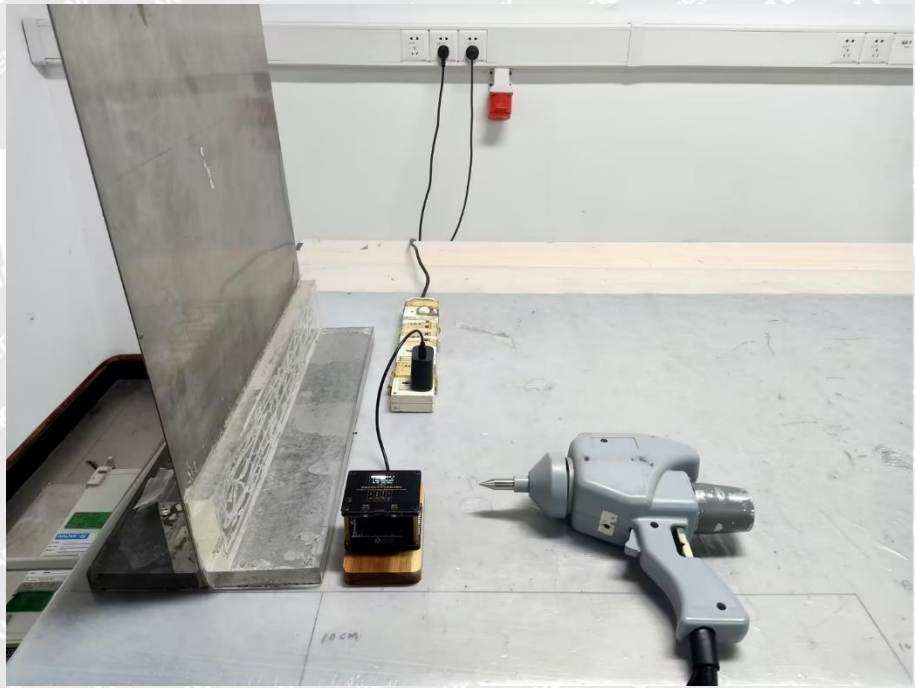




**Harmonic/Flicker Test
View**

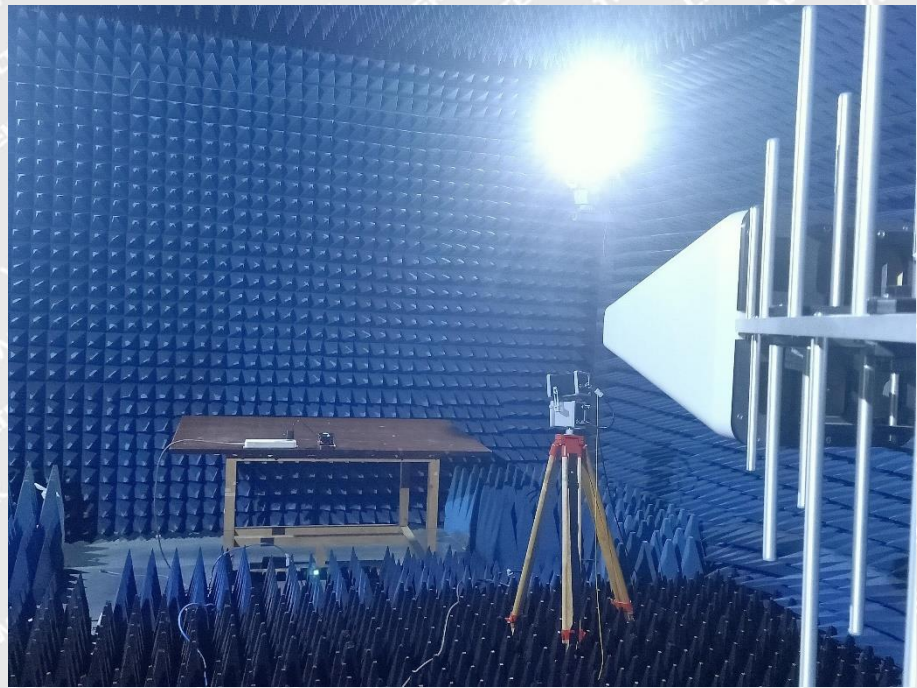


ESD Test View

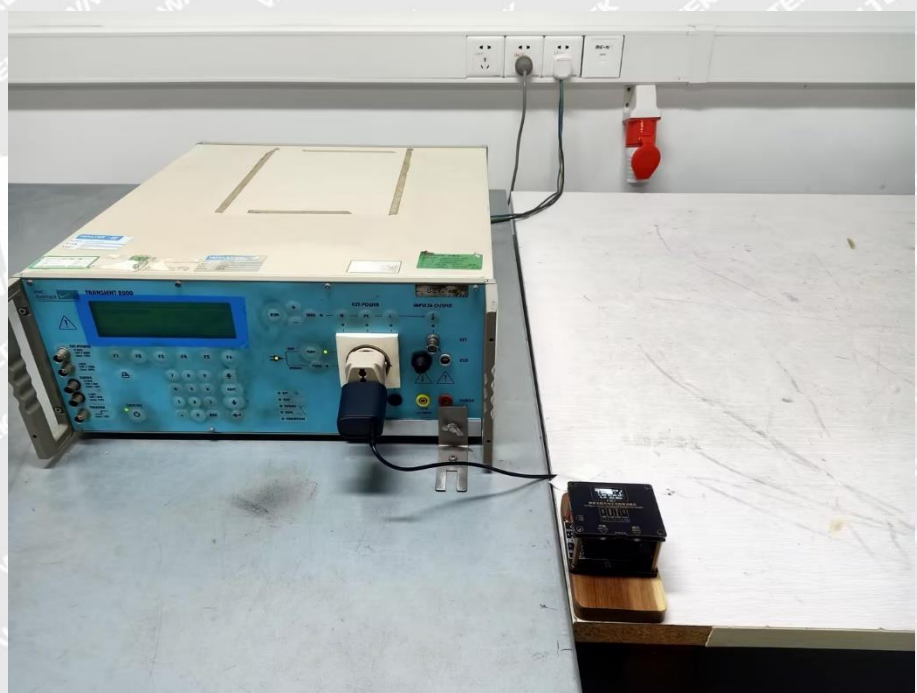




R/S Test View

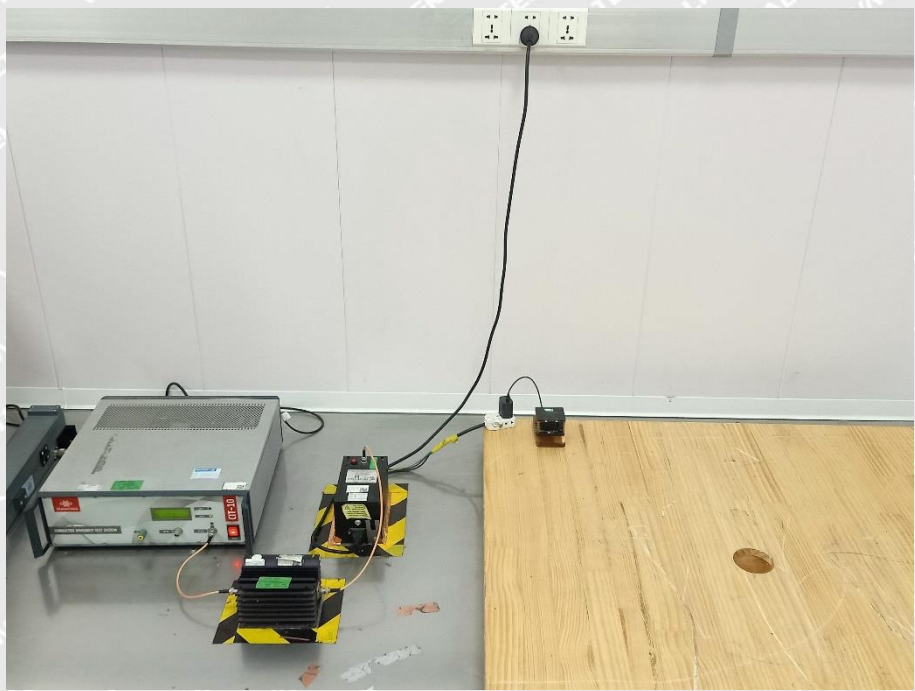


EFT/ Surges/ Dips and Interruptions Test View

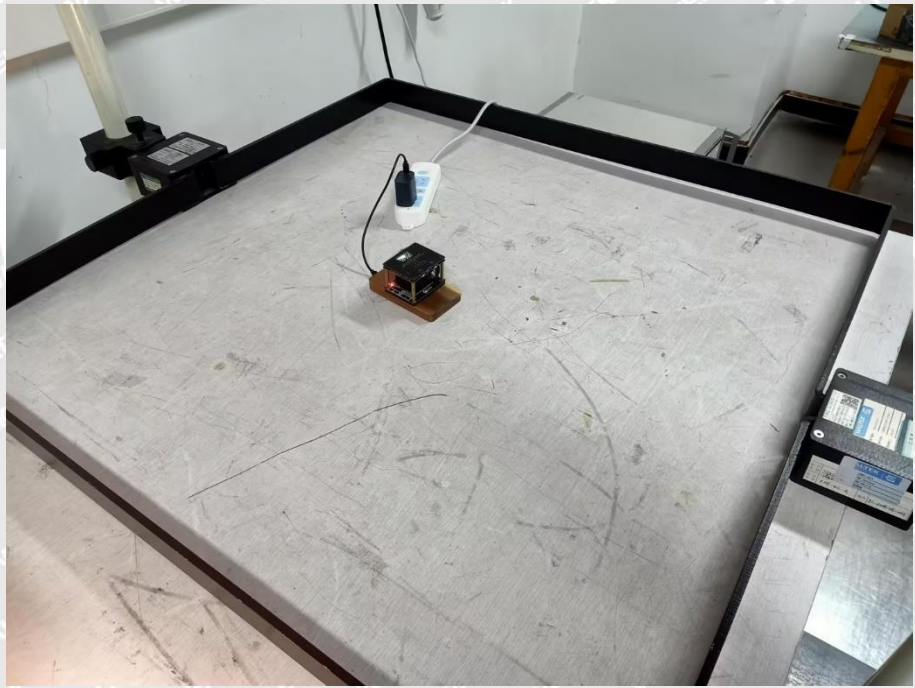




CS Test View



PFMF Test View



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