



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Reference No...... : WTF22F05105279E
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon,
Hong Kong
Manufacturer : 109617
Product Name..... : LED alarm clock bamboo casing
Model No...... : MO9922
Test specification..... : EN 55032:2015+A11:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019
Date of Receipt sample : 2022-05-27
Date of Test : 2022-05-27 to 2022-05-30
Date of Issue..... : 2022-06-07
Test Report Form No...... : WEI-55032A-04A
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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1 Test Summary

EMISSION				
Test Item	Test Standard	Class / Severity	Result	
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	EN 55032:2015+A11:2020	Table A.10	Pass	
Radiated Emission, 30MHz to 1000MHz	EN 55032:2015+A11:2020	Table A.4	Pass	
Harmonic Current Emission	EN IEC 61000-3-2:2019	Class A	Pass**	
Voltage Fluctuation and Flicker	EN 61000-3-3 :2013+A1 :2019	Clause 5	Pass	
IMMUNITY (EN 55035:2017+A11:2020)				
Test Item	Test Method	Class / Severity	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±8 kV Air	B	Pass
Continuous RF Electromagnetic Field Disturbances	IEC 61000-4-3: 2006+A1+A2	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4:2012	AC ±1.0 kV DC ±0.5 kV	B	Pass
Surge	IEC 61000-4-5:2005	±1Kv D.M.† ±2Kv C.M.‡	B	Pass
Continuous Induced RF Disturbances, 0.15MHz to 10MHz	IEC 61000-4-6:2008	3Vr.m.s.(emf), 80%, 1kHz Amp. Mod.	A	Pass
Continuous Induced RF Disturbances, 10MHz to 30MHz		3 to 1Vr.m.s.(emf), 80%, 1kHz Amp. Mod	A	Pass
Continuous Induced RF Disturbances, 30MHz to 80MHz		1Vr.m.s.(emf), 80%, 1kHz Amp. Mod	A	Pass
Power-Frequency Magnetic Field	IEC 61000-4-8:2009	1A/m	A	N/A
Voltage Dips	IEC 61000-4-11:2004	< 5 % U _T * for 0.5per	B	Pass
		70 % U _T * for 25/30per	C	Pass
Voltage Interruptions	IEC 61000-4-11:2004	< 5 % U _T * for 250/300per	C	Pass

Remark:

Pass Test item meets the requirement

Fail Test item does not meet the requirement

N/A Test case does not apply to the test object

A.M Amplitude Modulation

† Differential Mode

‡ Common Mode

* U_T is the nominal supply voltage

** According to EN IEC 61000-3-2 which states:" For the following categories of equipment limits are not specified in this edition of the standard. Equipment with a rated power of 75W or less, other than lighting equipment" Therefore there is no need for harmonics test to be performed on this product and deemed to fulfil emission requirements without testing.



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3 General Information

3.1 General Description of E.U.T.

Product Name : LED alarm clock bamboo casing
Model No. : MO9922
Remark : ---

3.2 Details of E.U.T.

Technical Data : Clock: 3 x AAA Batteries 1.5V
Adapter: Input: AC 100-240V, 50/60Hz, 0.3A Max;
Output: DC 5V, 0.5A, 2.5W

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9922 is the test sample. The DV&RE tests were performed in the condition of AC 240V/50Hz input. The other tests were performed in the condition of AC 230V/50Hz input. The RE, ESD and RS tests were performed in the additional condition of Battery 4.5V.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55032:2015+A11:2020	Electromagnetic compatibility of multimedia equipment — Emission Requirements
EN 55035:2017+A11:2020	Electromagnetic compatibility of multimedia equipment - Immunity requirements
EN IEC 61000-3-2:2019	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+A1:2019	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.



3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) 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. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

3.7 Abnormalities from Standard Conditions

None.



4 Equipment Used during Test

<input type="checkbox"/> Mains Terminal Disturbance Voltage (Conducted Emission) 1#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR3	102423	Valid
2.	LISN	R&S	ENV216	101343	Valid
3.	Cable 7	HUBER+SUHNER	CBL2-NN-6M	223NN624	Valid
4.	Switch	CD	RSU-A4 18G	RSUA4008	Valid
<input checked="" type="checkbox"/> Mains Terminal Disturbance Voltage (Conducted Emission) 2#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2.	LISN	R&S	ENV216	101215	Valid
3.	Cable 1	HUBER+SUHNER	CBL2-NN-6M	6102701	Valid
4.	Switch	ESE	RSU/M2	---	Valid
<input type="checkbox"/> Mains Terminal Disturbance Voltage (Conducted Emission) 3#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR3	102842	Valid
2.	LISN	R&S	ENV216	101542	Valid
3.	Cable 12	YIHENG	LMR195UF-NMNM-2.5	---	Valid
4.	Manual RF Switch	YIHENG	SW-2	RSU0402	Valid
<input checked="" type="checkbox"/> Radiated Emission (30MHz to 1GHz) 1#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	3m Semi-anechoic Chamber	CHANGCHUANG	9m×6m×6m	---	Valid
2.	EMI Test Receiver	R&S	ESR7	101566	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
4.	Coaxial Cable (below 1GHz)	HUBER+SUHNER	CBL3-NN-12+3 m	214NN320	Valid
<input type="checkbox"/> Radiated Emission (30MHz to 1GHz) 2#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	3m Semi-anechoic Chamber	YIHENG	10m×5.3m×3.5m	YH2021071804	Valid
2.	EMI Test Receiver	R&S	ESR7	102454	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9163	01418	Valid
4.	Coaxial Cable (below 1GHz)	YIHENG	LMR240UF-NMSM-7.5	---	Valid
<input checked="" type="checkbox"/> Radiated Emission (1GHz to 6GHz) 1#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	3m Semi-anechoic Chamber	CHANGCHUANG	9m×6m×6m	---	Valid
2.	EMI Test Receiver	R&S	ESR7	101566	Valid



3.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	01561	Valid
4.	Coaxial Cable (above 1GHz)	Times-Microwave	CBL5-NN	---	Valid
5.	Preamplifier	Lunar E M	LNA1G18-40	20160501002	Valid
<input type="checkbox"/> Radiated Emission (1GHz to 6GHz) 2#					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	3m Semi-anechoic Chamber	YIHENG	10m×5.3m×3.5m	YH2021071804	Valid
2.	EMI Test Receiver	R&S	ESR7	102454	Valid
3.	Broad-band Horn Antenna	SCHWARZBECK	BBHA9120D	02465	Valid
4.	Coaxial Cable (above 1GHz)	YIHENG	SFT205-NMSM-7	---	Valid
5.	Preamplifier	Tonscend	TAP0118045	AP21J806168	Valid
<input checked="" type="checkbox"/> Harmonics and Flicker Measuring System					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Harmonics and Flicker Measuring System	TESEQ	CCN1000-1	1133A01498	Valid
<input checked="" type="checkbox"/> ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	ESD Simulator	TESEQ	NSG437	521	Valid
<input checked="" type="checkbox"/> EFT & Voltage Dips and Interruptions					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMS test system	TESEQ	NSG3040	1858	Valid
<input checked="" type="checkbox"/> Surge					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Surge Simulator	TESEQ	NSG3060	1395	Valid
<input checked="" type="checkbox"/> Injected Currents					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Conducted Immunity test system	TESEQ	NSG4070	31469	Valid
2.	CDN	TESEQ	CDN M016	31586	Valid
3.	6dB Attenuator	TESEQ	ATN6075	32122	Valid
<input checked="" type="checkbox"/> Radio-frequency Electromagnetic Fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	RF Power Amplifier	OPHIR	5225R	1051/1712	Valid
2.	RF Power Amplifier	OPHIR	5293RE	1051/171	Valid
3.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	142	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	476	Valid



5.	RF signal generator	Agilent	N5181A	MY48180720	Valid
6.	Power meter	RS	NRP6A	101133	Valid
7.	Power meter	RS	NRP6A	101134	Valid

: **Not Used**

: **Used**

4.1 Software List

Description	Manufacturer	Model	Version
EMI Test Software (Conducted Emission 1#)	FARATRONIC	EZ-EMC	EMEC-3A1
EMI Test Software (Conducted Emission 2#)	FARATRONIC	EZ-EMC	CON-03A1
EMI Test Software (Conducted Emission 3#)	FARATRONIC	EZ-EMC	COM 3A1.1
EMI Test Software (Radiated Emission 1#)	FARATRONIC	EZ-EMC	RA-03A1-1
EMI Test Software (Radiated Emission 2#)	FARATRONIC	EZ-EMC	RA-03A1-1
Harmonics and Flicker Test Software	TESEQ	Win2100	V4.28
Radiated Immunity Test Software	TONSCEND	JS35-RS	V2.0.1.7

4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±3.2dB	(1)
Radiated Emission	30MHz~1GHz	±4.1dB	(1)
Radiated Emission	1GHz~6GHz	±5.0dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



4.3 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	/	/	/	/	/

4.4 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{LAB} is less than or equal to U_{cispr} , then

- Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{LAB} is greater than U_{cispr} , then

- Compliance is deemed to occur if no measured disturbance level, increased by $(U_{LAB} - U_{cispr})$, exceeds the disturbance limit;
- Non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{LAB} - U_{cispr})$, exceeds the disturbance limit.

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5 Emission Test Results

5.1 Mains Terminals Disturbance Voltage, 150 kHz to 30MHz

Test Requirement.....	: EN 55032 Annex A.3
Test Method.....	: EN 55032 Annex A.3
Test Result.....	: Pass
Frequency Range.....	: 150kHz to 30MHz
Class/Severity.....	: Table A.10 of EN 55032
Classification.....	: ClassB

5.1.1 E.U.T. Operation

Operating Environment:

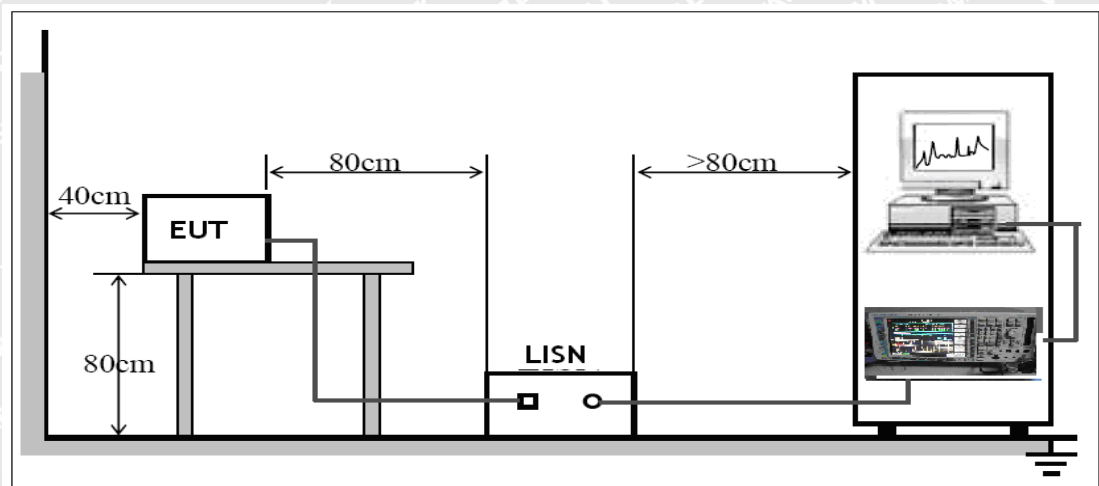
Temperature.....	: 24.8°C
Humidity.....	: 49.3%RH
Atmospheric Pressure.....	: 101.2kPa

EUT Operation:

Input Voltage.....	: AC 240V/50Hz
Operating Mode.....	: Charging + Working mode

5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the CISPR 16-1-2.



5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.



5.1.4 Corrected Amplitude & Margin Calculation

The Corrected factor is calculated by adding LISN VDF(Voltage Division Facotr), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Measurement} = \text{Reading Level} + \text{Correct Factor}$$

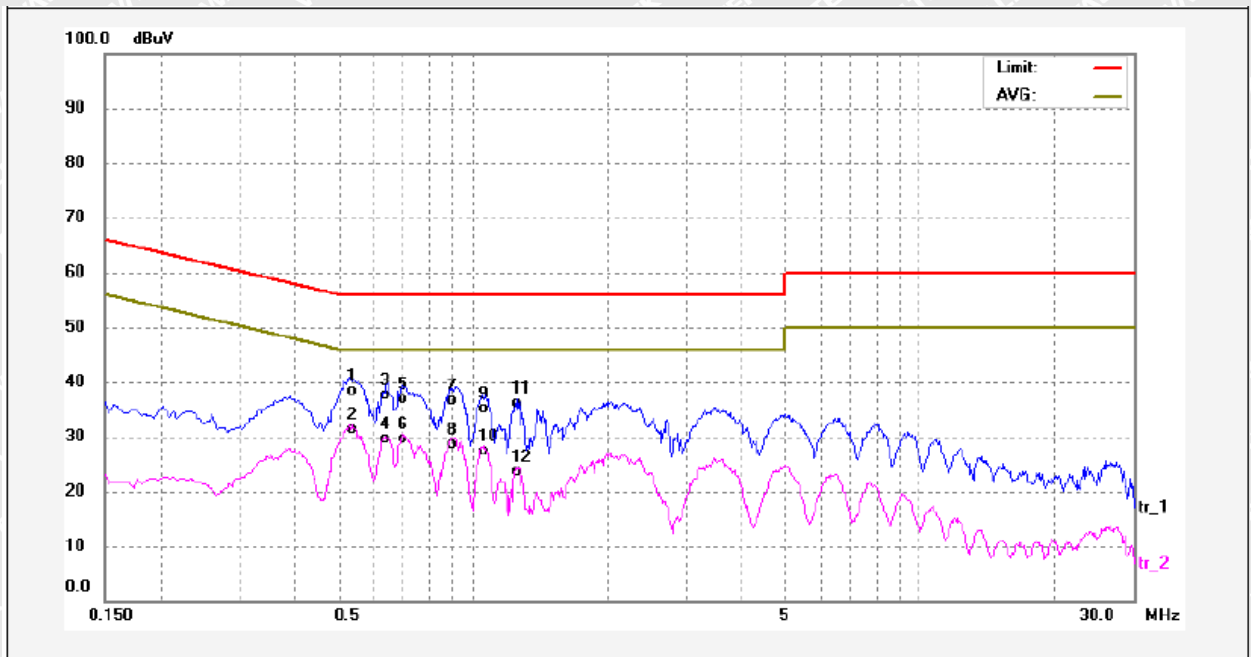
$$\text{Correct Facotor} = \text{LISN VDF} + \text{Cable Loss}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Measurement}$$

5.1.5 Mains Terminals Disturbance Voltage Test Data

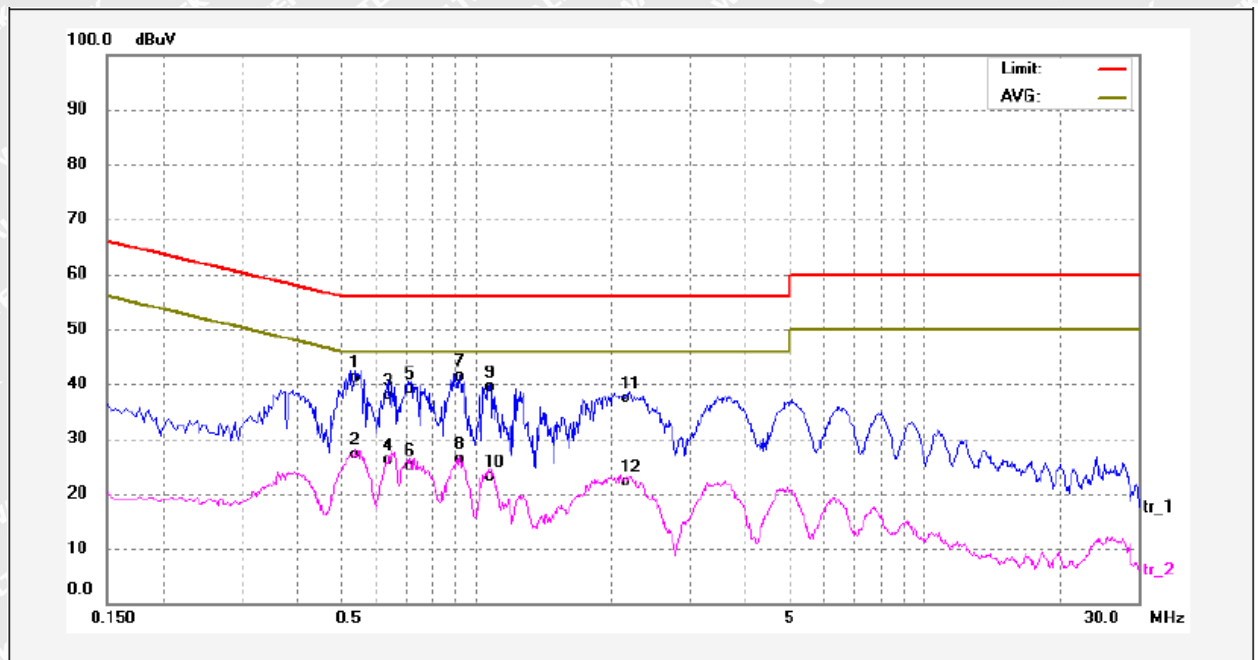
Live Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5420	27.58	9.69	37.27	56.00	-18.73	QP	
2	0.5420	20.67	9.69	30.36	46.00	-15.64	AVG	
3	0.6460	26.98	9.70	36.68	56.00	-19.32	QP	
4	0.6460	18.81	9.70	28.51	46.00	-17.49	AVG	
5	0.7060	26.18	9.70	35.88	56.00	-20.12	QP	
6	0.7060	18.94	9.70	28.64	46.00	-17.36	AVG	
7	0.9100	25.92	9.70	35.62	56.00	-20.38	QP	
8	0.9100	18.05	9.70	27.75	46.00	-18.25	AVG	
9	1.0700	24.47	9.71	34.18	56.00	-21.82	QP	
10	1.0700	16.63	9.71	26.34	46.00	-19.66	AVG	
11	1.2620	25.39	9.71	35.10	56.00	-20.90	QP	
12	1.2620	12.89	9.71	22.60	46.00	-23.40	AVG	



Neutral Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5380	30.42	9.70	40.12	56.00	-15.88	QP	
2	0.5380	16.55	9.70	26.25	46.00	-19.75	AVG	
3	0.6340	27.25	9.70	36.95	56.00	-19.05	QP	
4	0.6340	15.54	9.70	25.24	46.00	-20.76	AVG	
5	0.7180	28.49	9.70	38.19	56.00	-17.81	QP	
6	0.7180	14.32	9.70	24.02	46.00	-21.98	AVG	
7	0.9220	30.75	9.70	40.45	56.00	-15.55	QP	
8	0.9220	15.56	9.70	25.26	46.00	-20.74	AVG	
9	1.0740	28.53	9.73	38.26	56.00	-17.74	QP	
10	1.0740	12.29	9.73	22.02	46.00	-23.98	AVG	
11	2.1580	26.60	9.75	36.35	56.00	-19.65	QP	
12	2.1580	11.48	9.75	21.23	46.00	-24.77	AVG	



5.2 Radiated Emission, 30MHz to 1GHz

Test Requirement	: EN 55032 Annex A.2
Test Method	: EN 55032 Annex A.2
Test Limit	: Table A.4 of EN 55032
Test Result	: Pass
Frequency Range	: 30MHz to 1000MHz
Class	: Class B

5.2.1 E.U.T. Operation

Operating Environment:

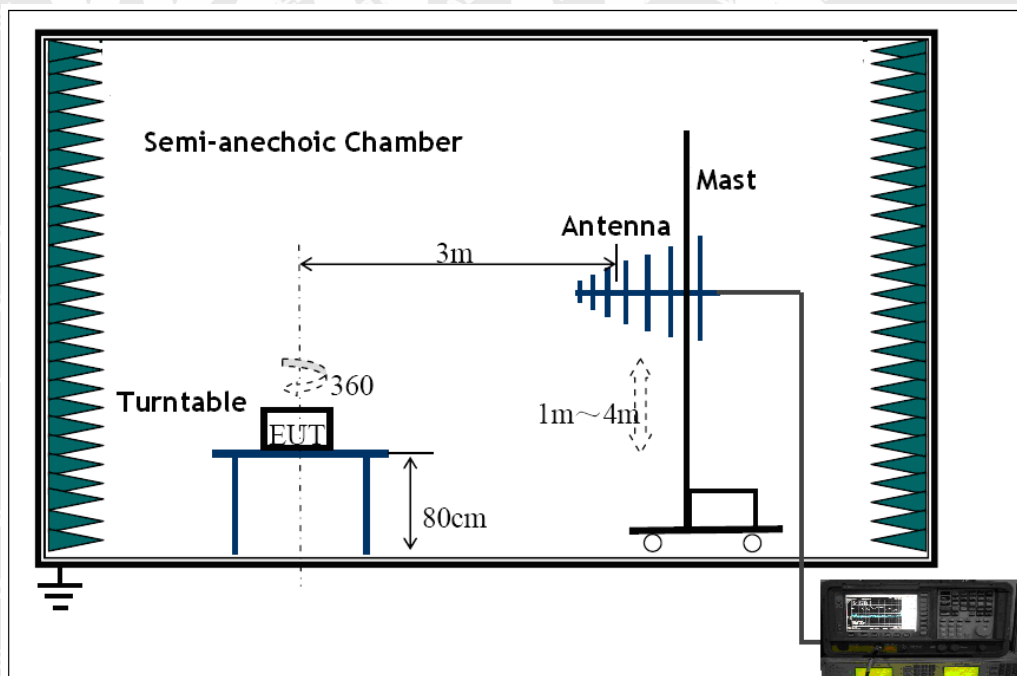
Temperature	: 21.3°C
Humidity	: 48.5%RH
Atmospheric Pressure	: 101.2kPa

EUT Operation:

Input Voltage	: AC 240V/50Hz; Battery 4.5V
Operating Mode	: Charging + Working mode; Battery Power mode

5.2.2 Block Diagram of Test Setup

The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for EUT 0°-360°. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.



5.2.4 Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Corr. Factor}$$

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

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B.

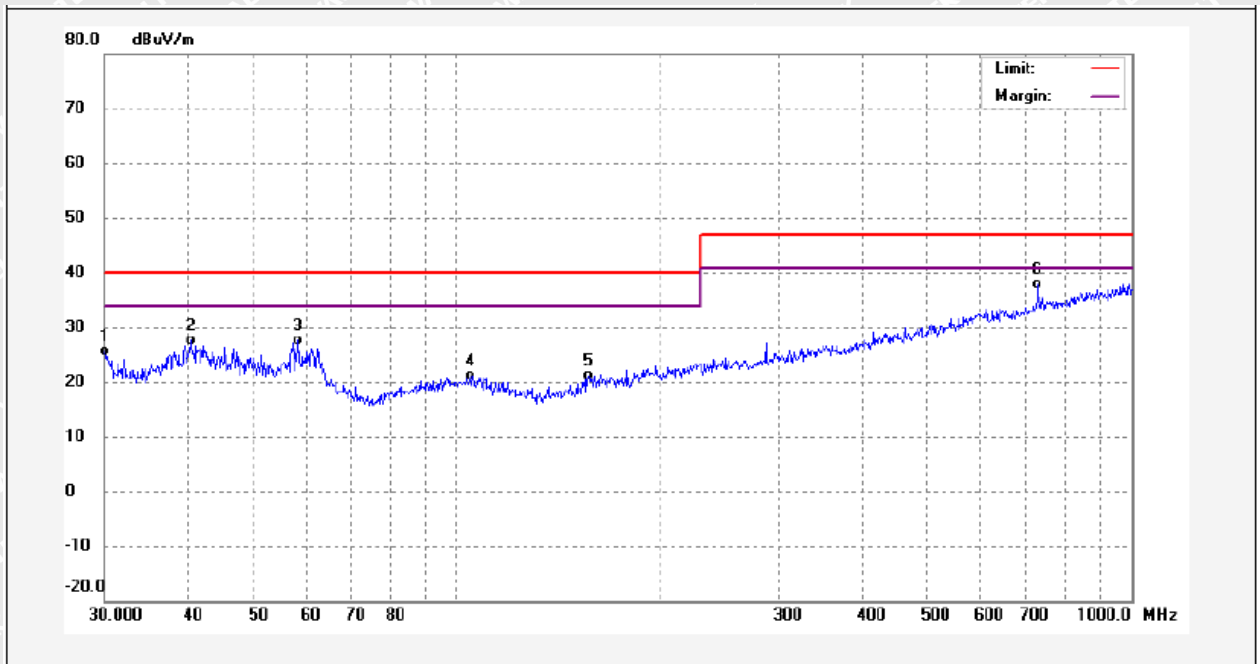
The equation for margin calculation is as follows:

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

5.2.5 Radiated Emission Test Data

Vertical Polarization

Charging + Working mode

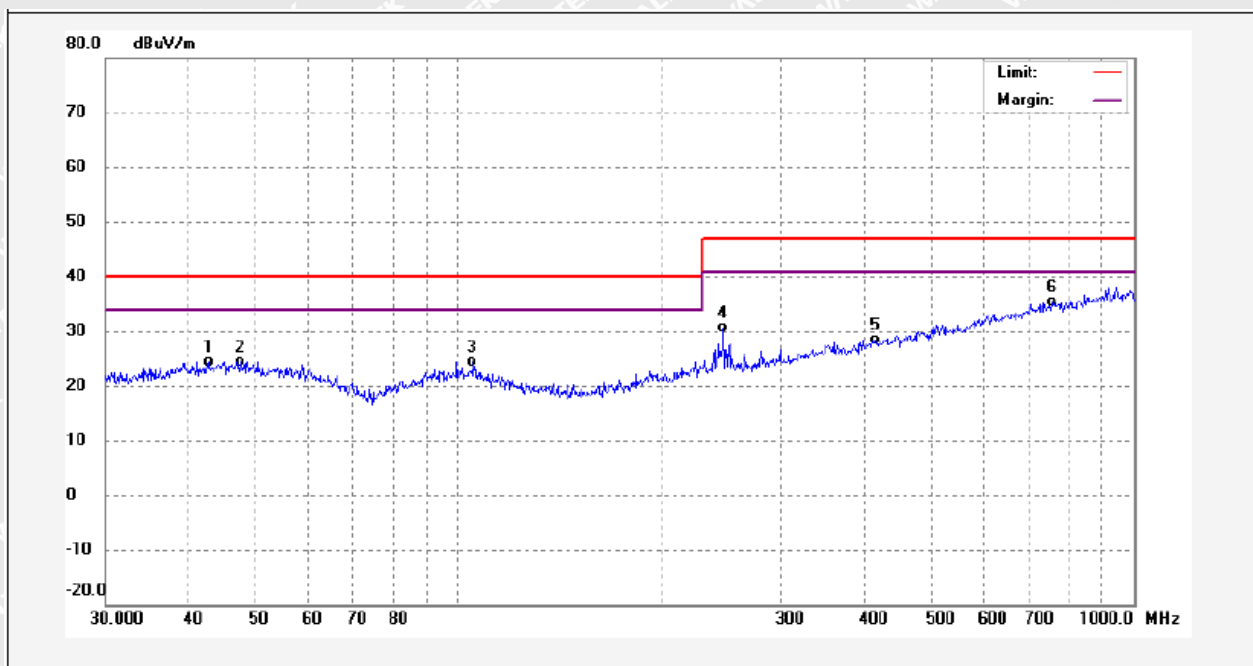


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.1687	14.44	11.26	25.70	40.00	-14.30	QP	
2	40.3605	14.54	13.03	27.57	40.00	-12.43	QP	
3	58.2846	15.13	12.53	27.66	40.00	-12.34	QP	
4	104.8664	9.70	11.33	21.03	40.00	-18.97	QP	
5	156.6773	10.93	10.19	21.12	40.00	-18.88	QP	
6	727.0601	15.26	22.54	37.80	47.00	-9.20	QP	



Horizontal Polarization

Charging + Working mode

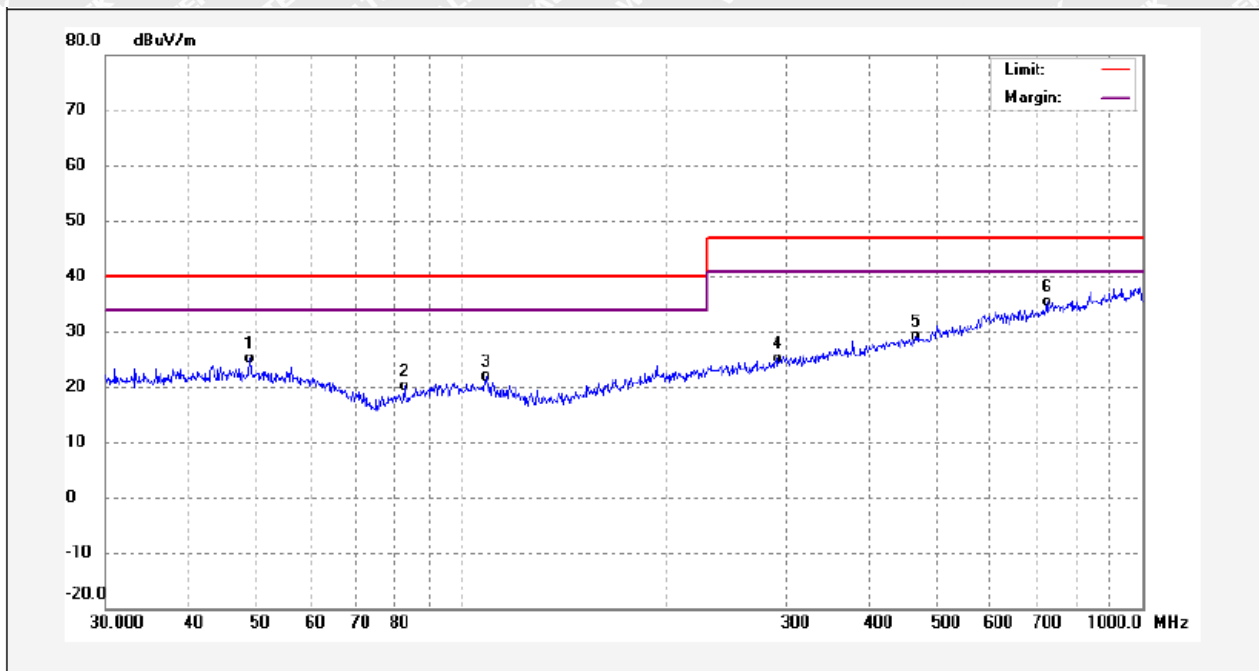


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	42.6897	10.17	14.33	24.50	40.00	-15.50	QP	
2	47.6586	10.02	14.45	24.47	40.00	-15.53	QP	
3	105.0873	10.78	13.53	24.31	40.00	-15.69	QP	
4	247.5083	16.87	13.77	30.64	47.00	-16.36	QP	
5	413.5605	10.80	17.63	28.43	47.00	-18.57	QP	
6	760.4369	12.19	23.30	35.49	47.00	-11.51	QP	



Vertical Polarization

Battery power mode

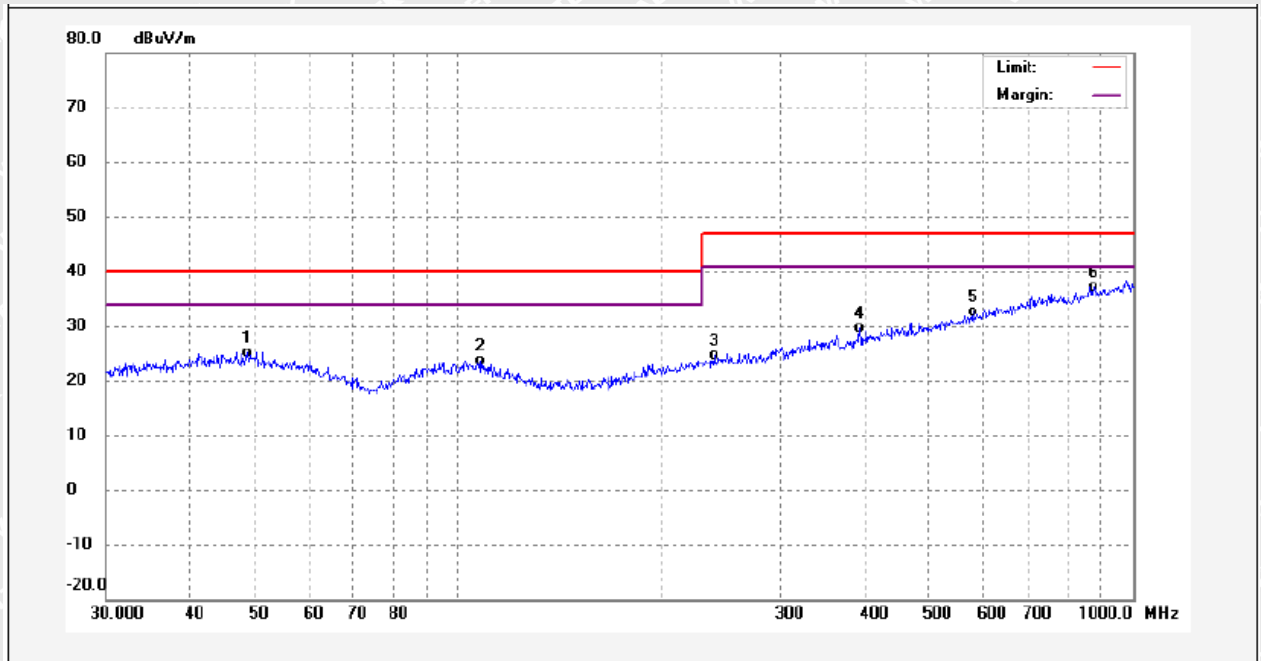


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	48.8772	11.66	13.39	25.05	40.00	-14.95	QP	
2	82.3877	11.15	8.95	20.10	40.00	-19.90	QP	
3	108.7232	10.81	10.98	21.79	40.00	-18.21	QP	
4	291.2402	10.71	14.54	25.25	47.00	-21.75	QP	
5	465.7627	11.20	17.97	29.17	47.00	-17.83	QP	
6	726.2957	12.81	22.51	35.32	47.00	-11.68	QP	



Horizontal Polarization

Battery power mode



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	48.8258	10.89	14.34	25.23	40.00	-14.77	QP	
2	107.8121	10.54	13.16	23.70	40.00	-16.30	QP	
3	239.1473	10.92	13.67	24.59	47.00	-22.41	QP	
4	393.8865	12.69	17.05	29.74	47.00	-17.26	QP	
5	579.0759	12.74	19.92	32.66	47.00	-14.34	QP	
6	875.5539	13.13	23.97	37.10	47.00	-9.90	QP	



5.3 Voltage Fluctuation and Flicker

Test Requirement : EN 61000-3-3

Test Method..... : EN 61000-3-3

Test Result : Pass

5.3.1 E.U.T. Operation

Operating Environment:

Temperature : 24.1°C

Humidity..... : 47.2%RH

Barometric Pressure..... : 101.2kPa

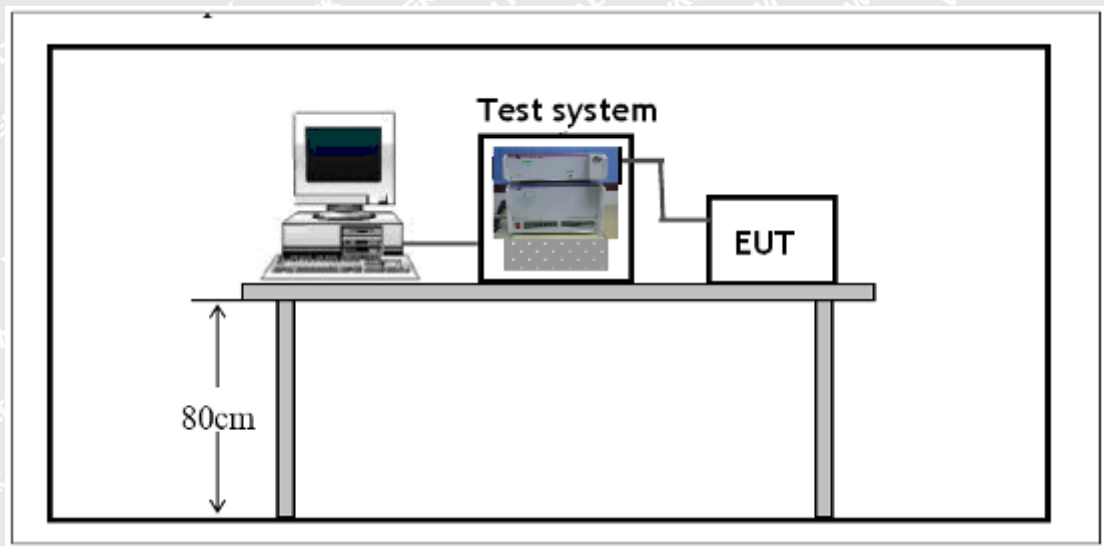
EUT Operation:

Input Voltage : AC 230V/50Hz

Operating Mode..... : Charging + Working mode

5.3.2 Block Diagram of Setup

The Voltage Fluctuation and Flicker test was performed in accordance with the EN 61000-3-3.





5.3.3 Voltage Fluctuation and Flicker Test Data

Flicker Test Summary per IEC61000-3-3:2013/AMD1:2017 (Run time)

EUT: LED alarm clock bamboo casing MO9922 (WTF22F05105279E) Tested by: Aris
 Test category: dt,dmax,dc and Pst (European limits) Test Margin: 100
 Test date: 2022/5/28 Start time: 10:38:36 End time: 10:49:03
 Test duration (min): 10 Data file name: F-000387.cts_data
 Comment: Working mode
 Customer:

Test Result: Pass

Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.17		
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):	0.064	Test limit:	1.000 Pass



6 Immunity Test Results

6.1 Performance Criteria

Performance criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Performance criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test

Performance criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

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6.2 Electrostatic Discharge (ESD)

Test Requirement.....	:	EN 55035
Test Method.....	:	IEC 61000-4-2
Test Result.....	:	Pass
Discharge Impedance.....	:	330Ω / 150pF
Discharge Voltage.....	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
Polarity.....	:	Positive & Negative
Number of Discharge.....	:	Minimum 10 times at each test point
Discharge Mode.....	:	Single Discharge
Discharge Period.....	:	1 second minimum

6.2.1 E.U.T. Operation

Operating Environment:

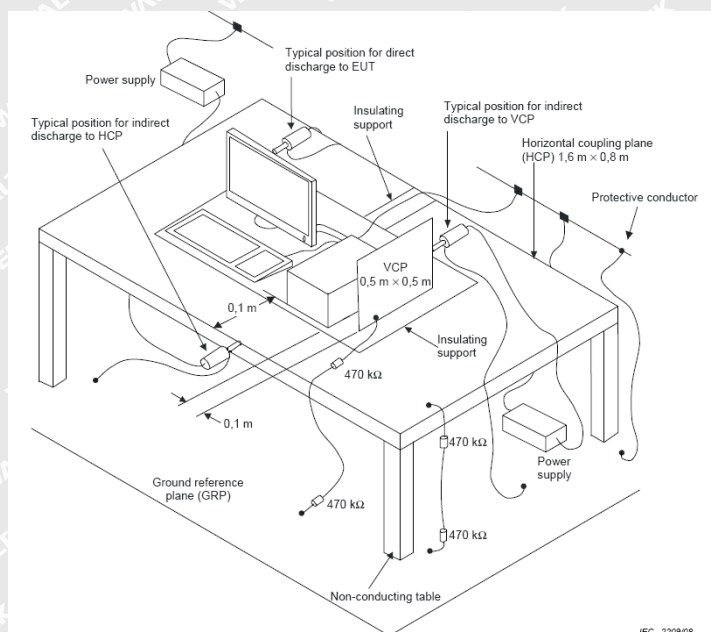
Temperature.....	:	21.2°C
Humidity.....	:	59.1%RH
Barometric Pressure.....	:	101.7kPa

EUT Operation:

Input Voltage.....	:	AC 230V/50Hz; Battery 4.5V
Operating Mode.....	:	Charging + Working mode; Battery Power mode

6.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.





6.2.3 Direct Discharge Test Results

Observations: Test points: 1. All Exposed Surface & Seams;
2. All metallic part

Direct Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Contact Discharge	Air Discharge
±8	B	1	N/A	Pass*
±4	B	2	Pass*	N/A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.2.4 Indirect Discharge Test Results

Observations: Test points: 1. All sides.

Indirect Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling
±4	B	1	Pass*	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)



6.3 Continuous RF Electromagnetic Field Disturbances

Test Requirement	: EN 55035
Test Method	: IEC 61000-4-3
Test Result	: Pass
Frequency Range	: 80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
Test level	: 3V/m
Modulation	: 80%, 1kHz Amplitude Modulation.
Face of EUT	: Front, Back, Left, Right
Antenna polarisation.....	: Horizontal & Vertical
Test Distance	: 3m

6.3.1 E.U.T. Operation

Operating Environment:

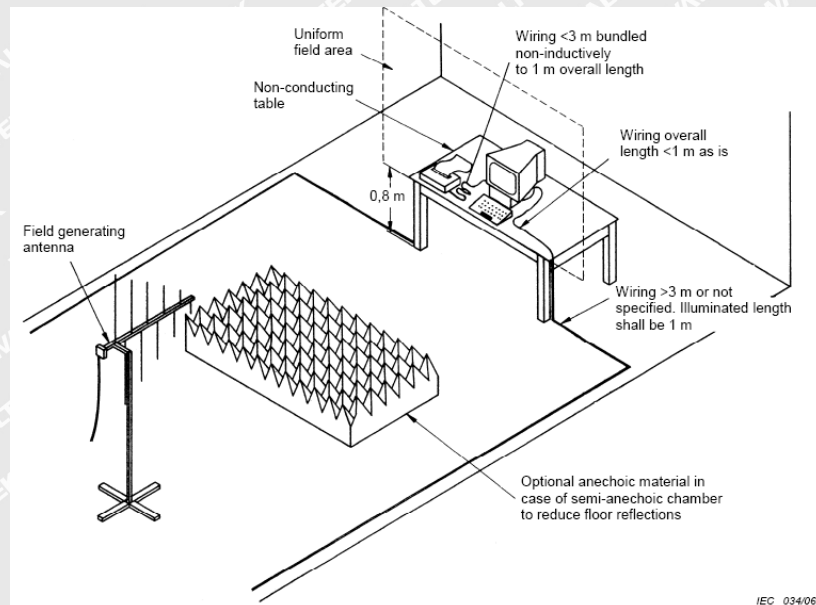
Temperature.....	: 21.2°C
Humidity.....	: 54.1%RH
Barometric Pressure.....	: 101.2kPa

EUT Operation:

Input Voltage.....	: AC 230V/50Hz; Battery 4.5V
Operating Mode.....	: Charging + Working mode; Battery Power mode

6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.





6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
1800MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
1800MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
5000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
5000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

- * During the test no deviation was detected to the selected operation mode(s)



6.4 Electrical Fast Transients (EFT)

Test Requirement	:	EN 55035
Test Method	:	IEC 61000-4-4
Test Result	:	Pass
Test Level	:	1.0kV on AC Mains
Polarity	:	Positive & Negative
Repetition Frequency	:	5kHz
Burst Duration	:	5/50ns
Test Duration	:	2 minutes per level & polarity

6.4.1 E.U.T. Operation

Operating Environment:

Temperature	:	21.2°C
Humidity	:	54.1%RH
Barometric Pressure	:	101.2kPa

EUT Operation:

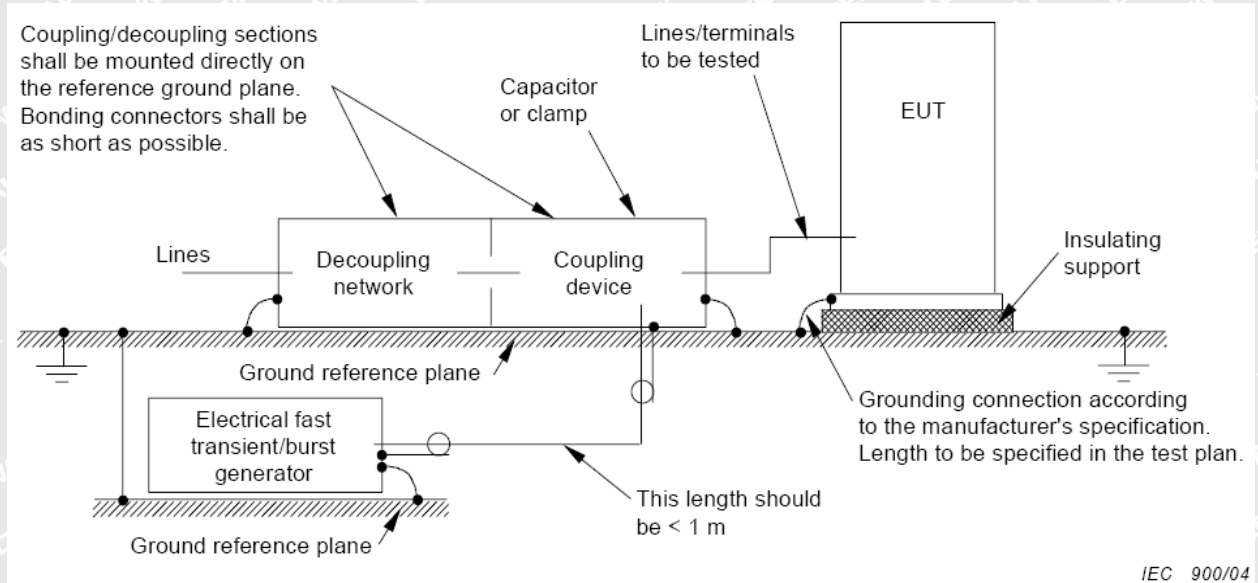
Input Voltage	:	AC 230V/50Hz
Operating Mode	:	On mode

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6.4.2 Block Diagram of Setup

The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.



6.4.3 Test Results

Test Port	Test Level(kV)	Performance Criterion	Result
Line-Neutral	±1.0	B	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)



6.5 Surge

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-5
Test Result.....	: Pass
Test level.....	: $\pm 1\text{kV}$ Live to Neutral, $\pm 2\text{kV}$ Live to PE and Neutral to PE
Interval.....	: 60s between each surge
No. of surges.....	: five positive and five negative pulses each at 0° , 90° , 180° and at 270°

6.5.1 E.U.T. Operation

Operating Environment:

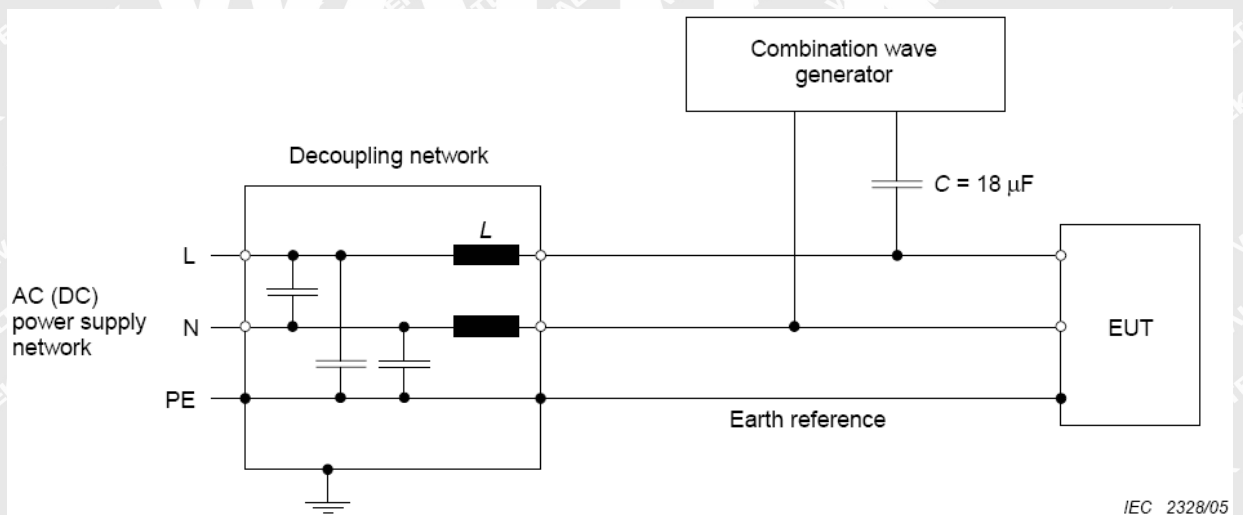
Temperature.....	: 21.2°C
Humidity.....	: 54.1%RH
Barometric Pressure.....	: 101.1kPa

EUT Operation:

Input Voltage.....	: AC 230V/50Hz
Operating Mode.....	: On mode

6.5.2 Block Diagram of Setup

The Surge Immunity test was performed in accordance with the IEC 61000-4-5.





6.5.3 Test Result

Test Port	Applied Voltage (kV)	Performance criterion	Result
Between Phase And Phase	± 1	B	N/A
Between Live And Neutral	± 1	B	Pass*
Between Live And Earth	± 2	B	N/A
Between Neutral And Earth	± 2	B	N/A

Remark:

- * During the test no deviation was detected to the selected operation mode(s)

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6.6 Continuous Induced RF Disturbance

Test Requirement	: EN 55035
Test Method	: IEC 61000-4-6
Test Result	: Pass
Frequency Range	: 0.15 to 10MHz, 10 to 30MHz, 30 to 80MHz
Test level	: 3V r.m.s. /3~1V r.m.s. / 1V r.m.s. (unmodulated emf into 150 Ω)
Modulation	: 80%, 1kHz Amplitude Modulation.

6.6.1 E.U.T. Operation

Operating Environment:

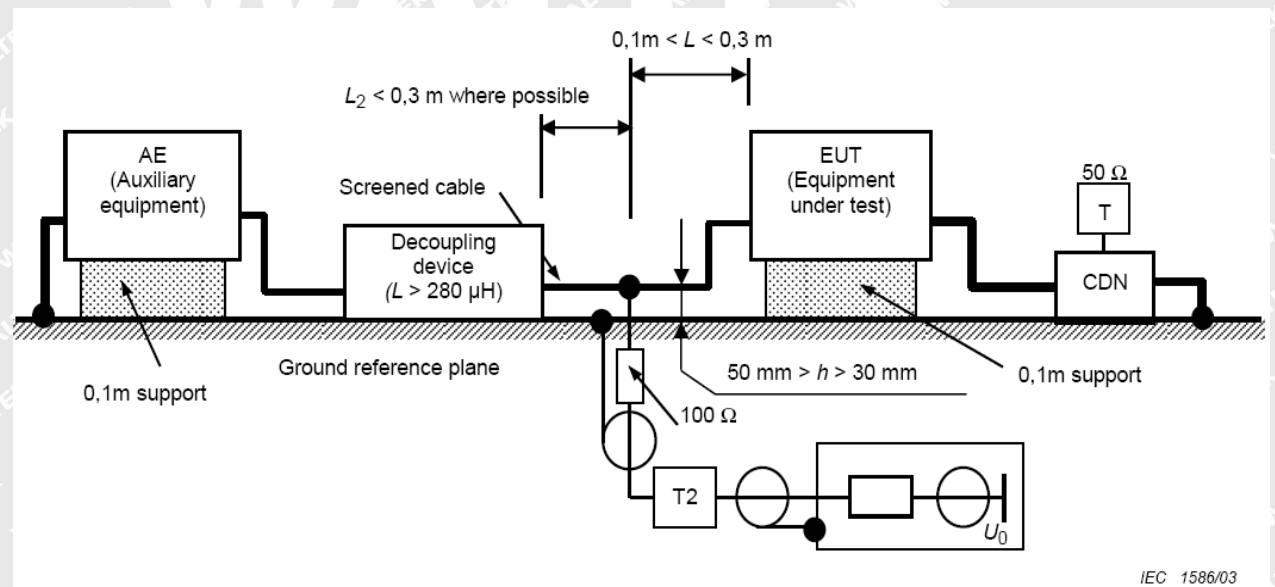
Temperature	: 21.2°C
Humidity	: 54.1%RH
Barometric Pressure	: 101.2kPa

EUT Operation:

Input Voltage	: AC 230V/50Hz
Operating Mode	: On mode

6.6.2 Block Diagram of Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6.





6.6.3 Test Results

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result
0.15MHz to 10MHz	2 Wire AC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	Pass*
10MHz to 30MHz	2 Wire AC Supply Cables	3 to 1 Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	Pass*
30MHz to 80MHz	2 Wire AC Supply Cables	1Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

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6.7 Voltage Dips and Interruptions

Test Requirement.....	:	EN 55035
Test Method.....	:	IEC 61000-4-11
Test Result.....	:	Pass
Test Level(Voltage reduction)	:	>90% & 30 % of Induction
No. of Dips / Interruptions.....	:	1 per Level at 20ms intervals

6.7.1 E.U.T. Operation

Operating Environment:

Temperature..... : 21.2°C

Humidity..... : 54.1%RH

Barometric Pressure..... : 101.2kPa

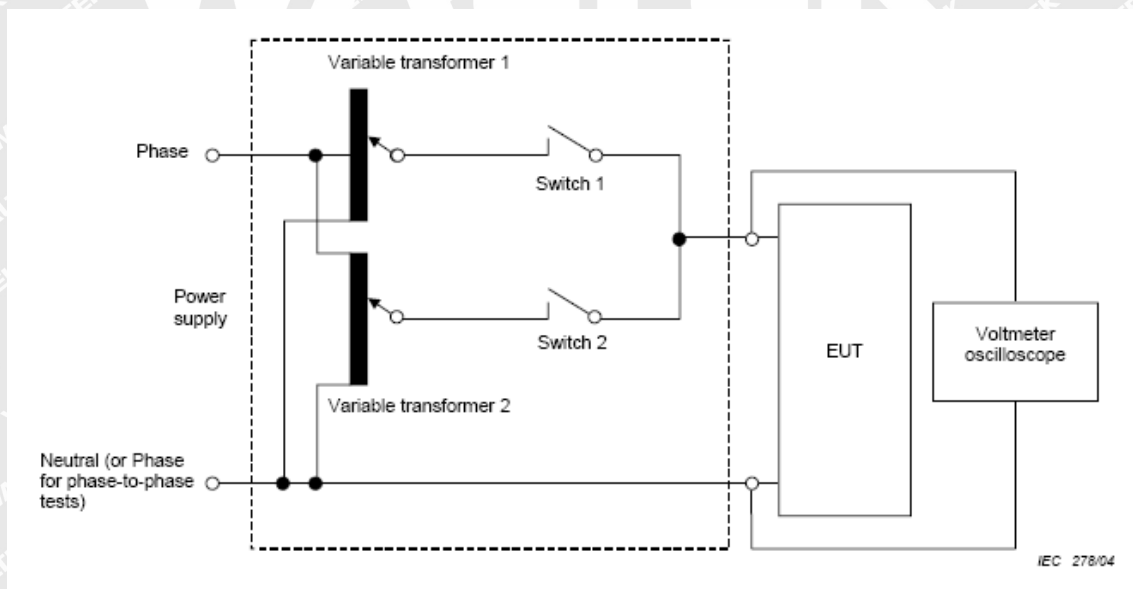
EUT Operation:

Input Voltage..... : AC 230V/50Hz

Operating Mode..... : On mode

6.7.2 Block Diagram of Setup

The Voltage Dips and Interruptions Immunity test was performed in accordance with the IEC 61000-4-11.





6.7.3 Test Results

Test Item	Test Level in %U _T	Performance criterion	50Hz		60Hz	
			Duration	Result	Duration	Result
Voltage Dips	< 5	B	0.5	Pass*	0.5	Pass*
	70	C	25	Pass*	30	Pass*
Voltage Interruptions	< 5	C	250	Pass*	300	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

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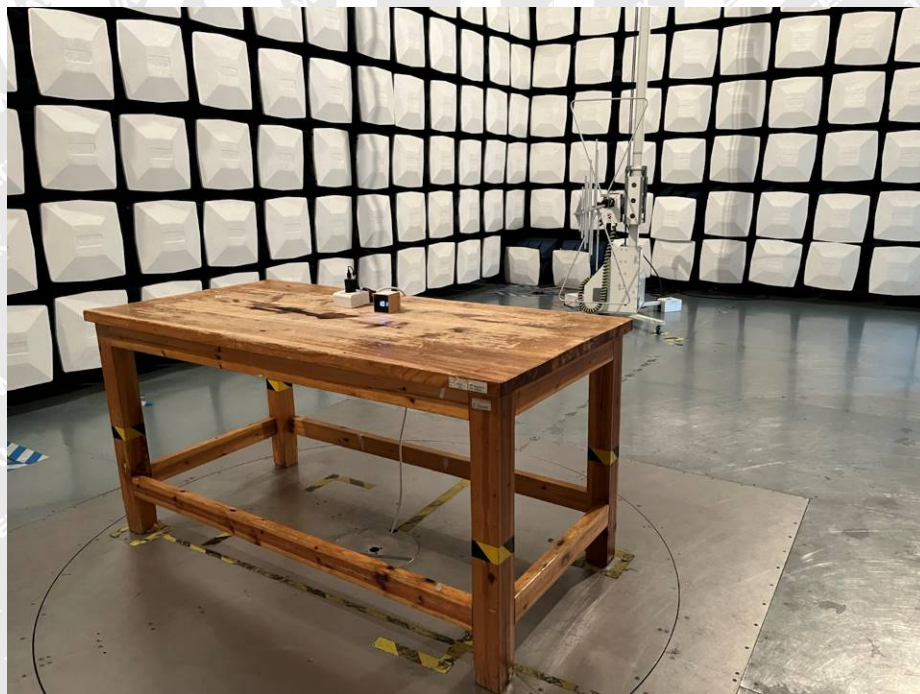


7 Photographs – Test Setup

7.1 Photograph – Mains Terminal Disturbance Voltage Test Setup



7.2 Photograph – Radiated Emission Test Setup





7.3 Photograph – Voltage Fluctuation and Flicker Test Setup

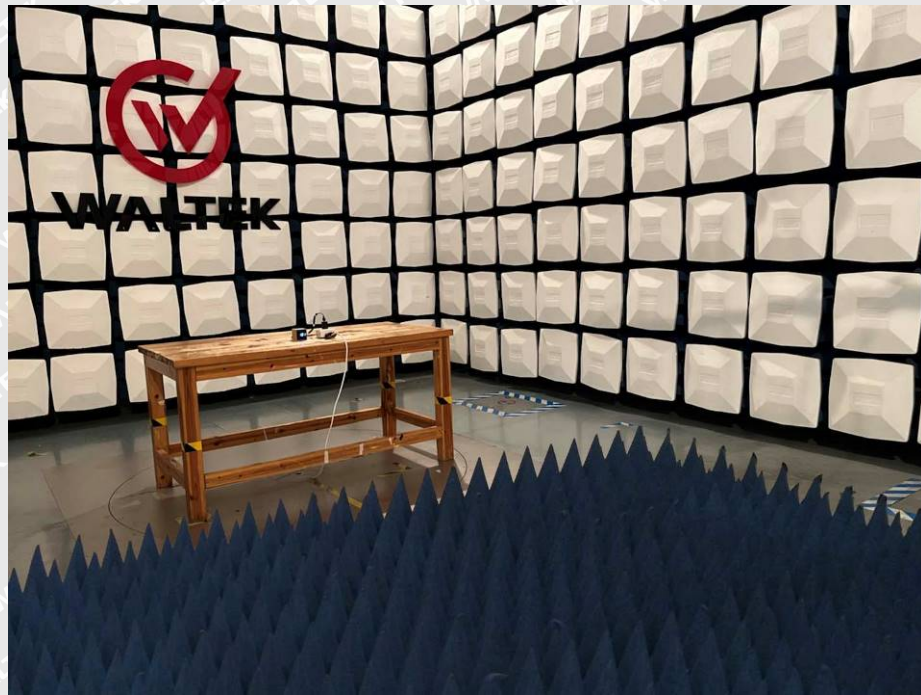


7.4 Photograph – ESD Immunity Test Setup

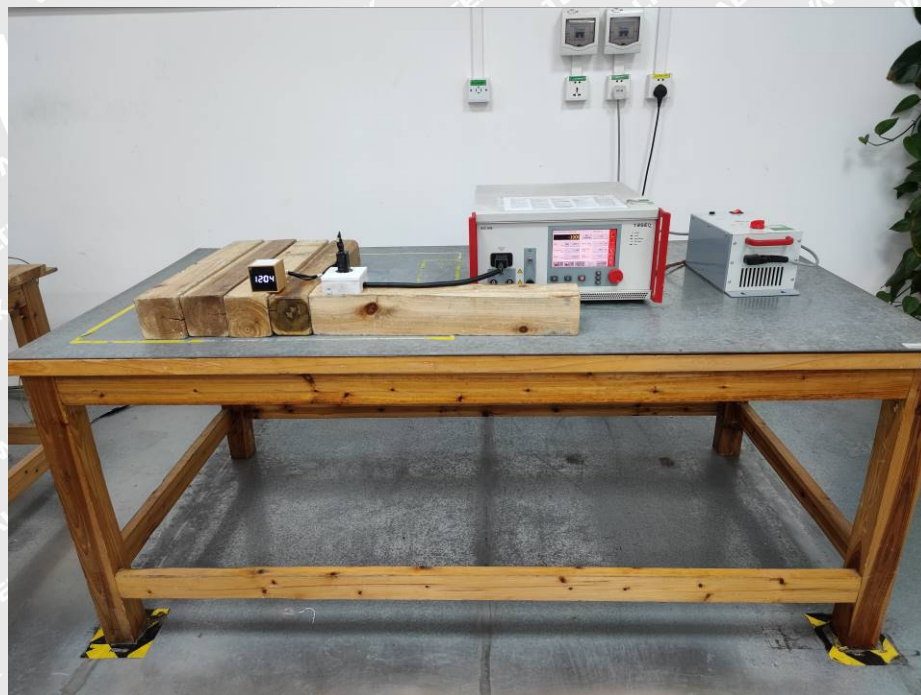




7.5 Photograph – Continuous RF Electromagnetic Field Disturbances Test Setup



7.6 Photograph – EFT Immunity Test Setup





7.7 Photograph – Surge Immunity Test Setup

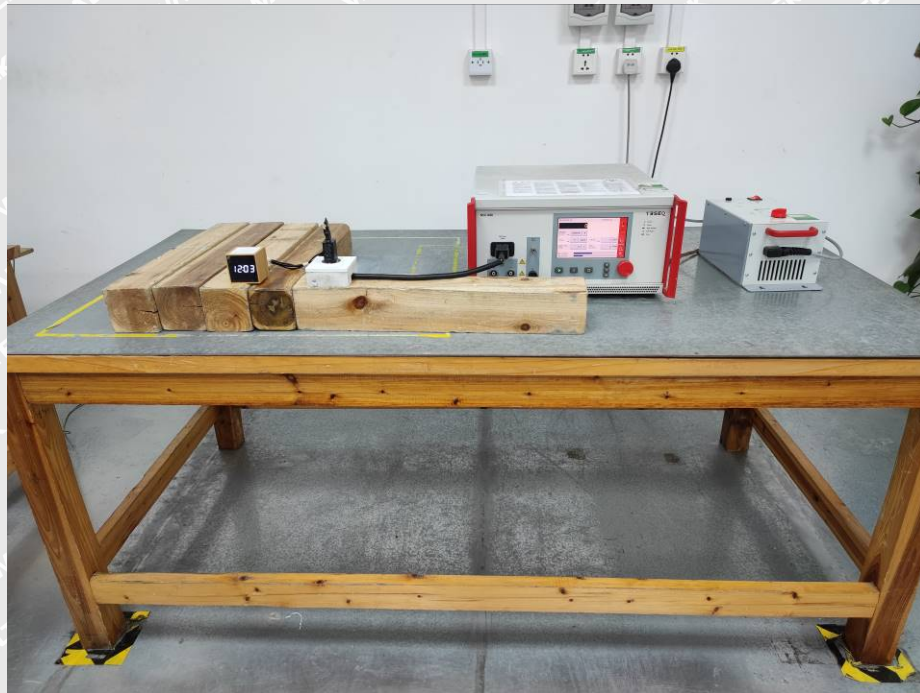


7.8 Photograph – Continuous Induced RF Disturbance Test Setup





7.9 Photograph – Voltage Dips and Interruptions Immunity Test Setup



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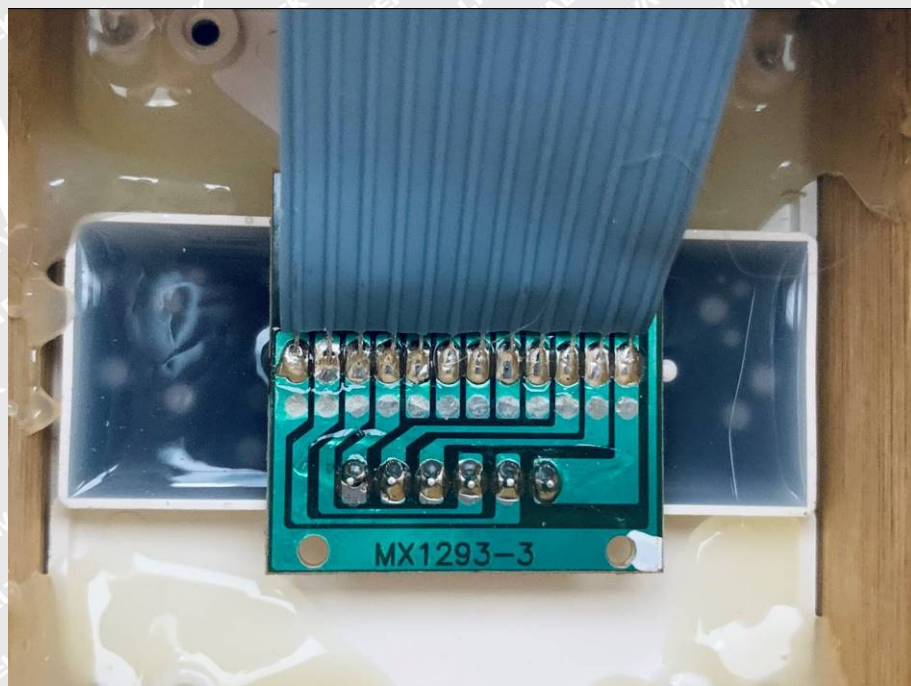
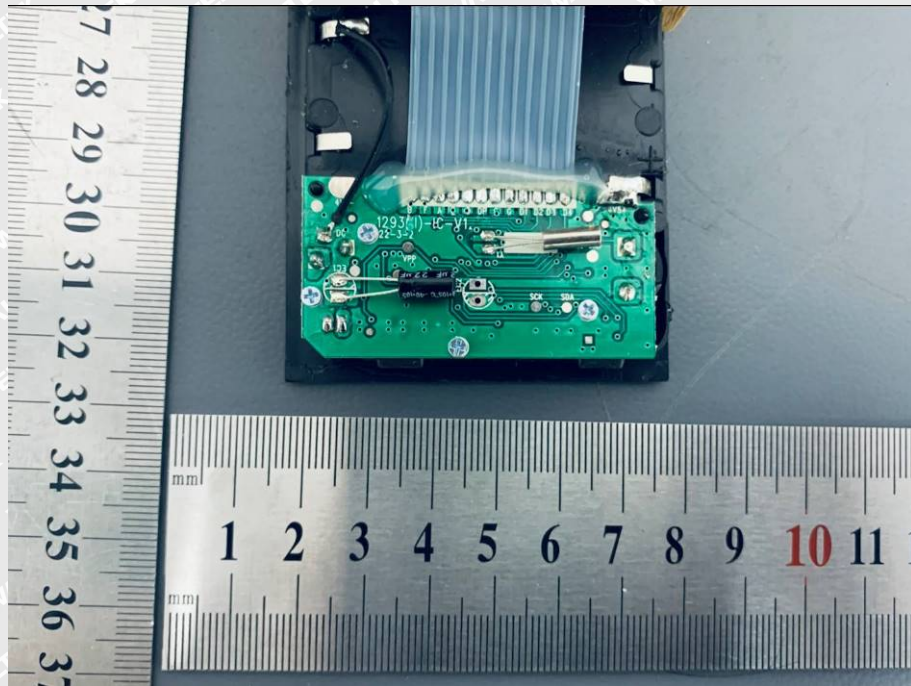
8 Photographs – Constructional Details

8.1 EUT – External View





8.2 EUT – Internal View



==== End of Report =====

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EMC TEST REPORT

Report No: TMT-E21012501

Product Name: AC ADAPTER

Model No. HJ-AD06-050*, HJ-AD10-050*, HJ-AD12-050*,
HJ-AD15-050*, HJ-AD18-050*, HJ-A01U-050*
 (“*” is variables, see page 5 for details)

Applicant:

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with EN 55032:2015, EN 55035:2017, EN IEC 61000-3-2:2014 and EN 61000-3-3:2013/A1:2019
Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from TMT; All Test Data Presented in this report is only applicable to presented Test sample.

Guangdong TMT Technology Co., Ltd.

Room 202, building 2, No. 10, Lianhua Road, Chang'an Town, Dongguan City, Guangdong
www.tmtenergy.cn



Test Report of EMC					
Product name	AC ADAPTER				
Model No.	HJ-AD06-050*, HJ-AD10-050*, HJ-AD12-050*, HJ-AD15-050*, HJ-AD18-050*, HJ-A01U-050* ("*" is variables, see page 5 for details)				
Ratings	Input: 100-240V~, 50/60Hz, 0.30A max Output: see the model list for details				
Trade Mark					
Applicant	Name				
	Address				
Manufacturer	Name				
	Address				
Factory	Name				
	Address				
Standard	EN 55032:2015 EN 55035:2017 EN 61000-3-2:2014 EN 61000-3-3:2013+A1:2019				
Test Location	1F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China.				
Receipt Date	2021.01.25	Test period	2021.01.26-2021.01.27	Issue Date	2021.01.30
Conclusion	The equipment under test was found to be compliance with the requirements of the standards applied.				
Tested by:			Approved by:		
Rocky.Gu / Engineer			Blake.Qin / Manager		



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1. Brief Summary of Results

A brief summary of the tests carried out in accordance with EMC- Directive 2014/30/EU and its amendments is shown below.

EMISSION(EN 55032:2015)				
Description of Test Item	Standard	Results	Remark	
Conducted Emission at The Main Terminals Test	EN 55032: 2015	PASS	Class B	
Conducted Emission at Telecommunication Port Test	EN 55032: 2015	N/A		
Radiated emission (30-1000MHz)	EN 55032: 2015	PASS	Class B	
Radiated emission Above 1GHz	EN 55032: 2015	N/A		
Harmonic current emission	EN 61000-3-2:2014	PASS	Note 1	
Voltage Fluctuations-Flicker	EN 61000-3-3:2013 +A1:2019	PASS	Note 2	
IMMUNITY(EN 55035:2017)				
Description of Test Item	Basic Standard	Results	Performance Criteria	Observation Criteria
Electrostatic Discharge (ESD)	EN 61000-4-2:2009	PASS	B	A
Electromagnetic field immunity (RS)	EN 61000-4-3:2006 +A1:2008+A2:2010	PASS	A	A
Electric Fast Transient/Burst Immunity (EFT)	EN 61000-4-4:2012	PASS	B	A
Surge Immunity	EN 61000-4-5:2014 +A1:2017	PASS	B	A
Immunity to Conducted Disturbances, Induced by Radio-frequency Fields(CS)	EN 61000-4-6:2014	PASS	A	A
Power- frequency magnetic field	EN 61000-4-8:2010	N/A	Note 3	
Voltage dips, 100% reduction	EN 61000-4-11:2004	PASS	B	A
Voltage dips, 30% reduction		PASS	C	B
Voltage Interruptions, 100% reduction		PASS	C	B
"N/A" is an abbreviation for Not Applicable.				
Note 1: This test only applicable to product has a rated power more than 75W, other than lighting equipment.				
Note 2: This EUT is unlikely to produce significant voltage fluctuations or flicker by examination of the circuit diagram and specification of it. So it is deemed to fulfill the requirements without test				
Note 3: Applicable only to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamics microphones, magnetic field sensors, etc.				
Final Judgment : PASS				



2. General Information

The information contained in this report is intended to show verification of the EMC Qualification Approval Testing of the requirements of the standards for the tests listed in Section 1.

2.1 Product Information

2.1.1 General Description of EUT (Equipment Under Test)

Product Name : AC ADAPTER
 Models : HJ-AD06-050*, HJ-AD10-050*, HJ-AD12-050*, HJ-AD15-050*, HJ-AD18-050*,
 HJ-A01U-050* (“*” is variables)
 Ratings : Input: 100-240V~, 50/60Hz, 0.30A max
 Output: see the model list for details

Model List

Model	Input	Output			Transformer
		Voltage (Vdc)	Current (mA)	Max Power (W)	
HJ-AD06-050*, HJ-AD10-050*, HJ-AD12-050*, HJ-AD15-050*, HJ-AD18-050*, HJ-A01U-050*	100-240V~, 50/60Hz, 0.30 Max	5.0	0.01-2.1	10.5	HJ-L1202-050200

All models are identical except for model name.



2.2 Test Configuration

Test samples	Configuration	Description
1. HJ-AD10-050210	AC Powered	230Vac/50Hz
		110Vac/60Hz

2.3 Modes of Operation

Pretest Mode	Description
Mode	Full Load

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

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

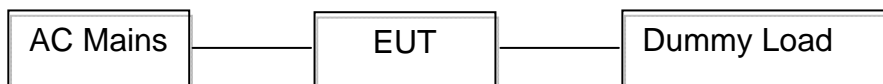
The worst Test Mode	Description
Mode	Full Load
Remark: The worst case is listed on this report.	



2.4 Block Diagram Showing The Configuration of System Tested

EUT: AC ADAPTER

EMI:



EMS:



Highest internal frequency : <108MHz

EUT type : Table top Floor standing

2.5 Tested Supporting System Details

No.	Description	Equipment No.	Manufacturer	Model	Serial Number
1.	slide rheostat	KST-EE108	N/A	10A 10Ω	N/A
2	slide rheostat	KST-EE110	N/A	4A 50Ω	N/A



2.6 Test Location

Test Site 1:

Company name: KeySense Testing& Certification International Co., Ltd.

Address: 1-3/F Lab Building, No. 29 District, Zhongkai Hi-Tech, Industrial Development Park, Huizhou, Guangdong, China.

Registration No.:L9678

Test Name	Test Site
Conducted Emission at The Main Terminals Test	1
Conducted emission at telecommunication port test	N/A
Radiated Emissions Test(30-1000MHz)	1
Radiated Emissions (above 1GHz)	N/A
Harmonic current emission	N/A
Voltage Fluctuations-Flicker	N/A
Electrostatic Discharge (ESD)	1
Electromagnetic field immunity test modulated(RS)	1
Electric Fast Transient/ Burst Immunity Test	1
Surge Immunity Test	1
Immunity to Conducted Disturbances, Induced by Radio-frequency Fields	1
Power-frequency magnetic field	N/A
Voltage dips& Voltage interruptions	1



3. Test Equipment Information

3.1 General Test Equipment Used

Equipment for conduction emission test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Receiver	R&S	ESR3	102054	2020.12.15	1 year
LISN	AFJ	LS16	16011618383	2020.09.09	1 year
ISN	Schwarzbeck	ISN-CAT6	NTFM81580138	2020.09.09	1 year
Pulse limiter	Compliance Direction	PLA-10N	110525-010-2006	2020.12.15	1 year

Equipment for Radiation emission test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Receiver	R&S	ESR3	102055	2020.12.15	1 year
Trilog-boardband antenna	Schwarzbeck	VULB 9163D	9163-961	2019.05.18	3 years

Equipment for HARMONIC/FLICKER test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Harmonic & Flicker analyzer	California Instruments	100-CTS-230	1626A00278	2020.09.09	1 year
Programmable power supply	California Instruments	5001lx-CTS-400	1629A02598	2020.09.09	1 year

Equipment for ESD test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
ESD generator	Noiseken	ESS-L1611	ESS1643151	2020.09.11	1 year

Equipment for RS test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Signal generator	R&S	SMC100A	105651	2020.12.15	1 year
Power amplifier	PRANA	MT400	1507-1746	2020.12.15	1 year
Power amplifier	PRANA	SV70	1602-1820	2020.12.15	1 year
Trilog-boardband antenna	Schwarzbeck	STLP 9128E	9128ES-136	2019.09.02	3 years
Horn antenna	Schwarzbeck	BBHA 9120E	BBHA9120E698	2020.10.25	3 years
Power meter	R&S	NRP2	105155	2020.12.15	1 year



Equipment for Electric Fast Transient/Burst Immunity test (EFT)

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
EFT generator	Noiseken	FNS-AX3-A16C	FNS1621762	2020.09.09	1 year
Coupling clamp	Noiseken	15-00009A	FNS15Y1753	2020.09.09	1 year

Equipment for Surge Immunity test

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Surge generator	Noiseken	LSS-6230A	LSS1634248	2020.09.09	1 year
Telecom lines CDN	Noiseken	LSS-INJ6401TEL	LSS1654360	2020.09.09	1 year
Interconnection lines unit	Noiseken	LSS-INJ6401SIG	LSS1654361	2020.09.09	1 year

Equipment for Immunity to Conducted Disturbances, Induced by Radio-frequency Fields test (CS)

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Signal generator	R&S	SMC100A	105651	2020.12.15	1 year
CDN	TESEQ	M016	43434	2020.09.09	1 year
Power amplifier	PRANA	DR220	1602-1819	2020.12.15	1 year
EM clamp	TESEQ	KEMA 801A	41399	2020.12.24	1 year

Equipment for Voltage Dips/Interruption test (DIP)

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
Dips simulator	Noiseken	VDS-2002	VDS1510396	2020.09.09	1 year



4. Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

System Measurement Uncertainty	
Test Item	Uncertainty
Uncertainty for Conduction emission test in shielding room	2.5dB(150kHz to 30MHz)
Uncertainty for Radiation emission test in shielding room	4.24dB (30MHz~1000MHz)

5. Emission Test Result

5.1 Conducted Emissions

5.1.1 Specification Reference

EN 55032:2015, Clause Annex A.3

5.1.2 Environmental Conditions

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 26, 2020	23.3°C	50%	101.5kPa

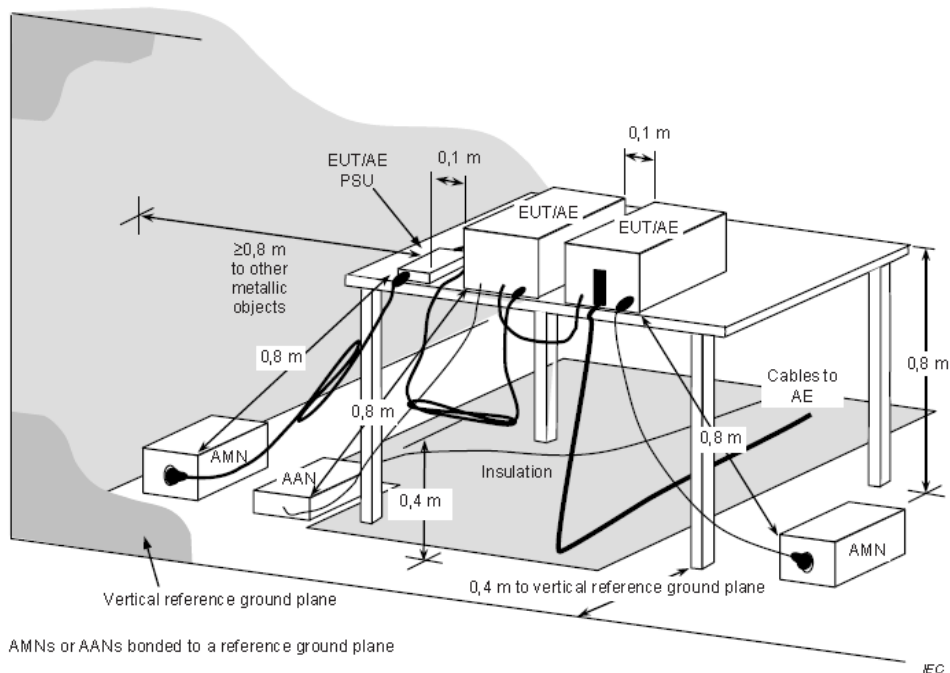
5.1.3 Limits

Frequency Range (MHz)	At the AC mains power ports of Class B equipment		At telecommunication ports of Class B equipment	
	Quasi-peak (dBµV)	Average (dBµV)	Quasi-peak (dBµV)	Average (dBµV)
0.15 -0.5	66 - 56 *	56 - 46 *	84 -74 *	74-64 *
0.50 -5.0	56	46	74	64
5.0 -30.0	60.	50		

Note:

- * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz
- If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

5.1.4 Test Setup & Test Method



The 0,8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be $\geq 0,8$ m.

The bandwidth of the test receiver (R&S ESR Test Receiver) is set at 9kHz.
 The frequency range from 150kHz to 30MHz is checked.



The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to specification on conducted Disturbance test.

5.1.5 Conducted Disturbance at Mains Terminals Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)



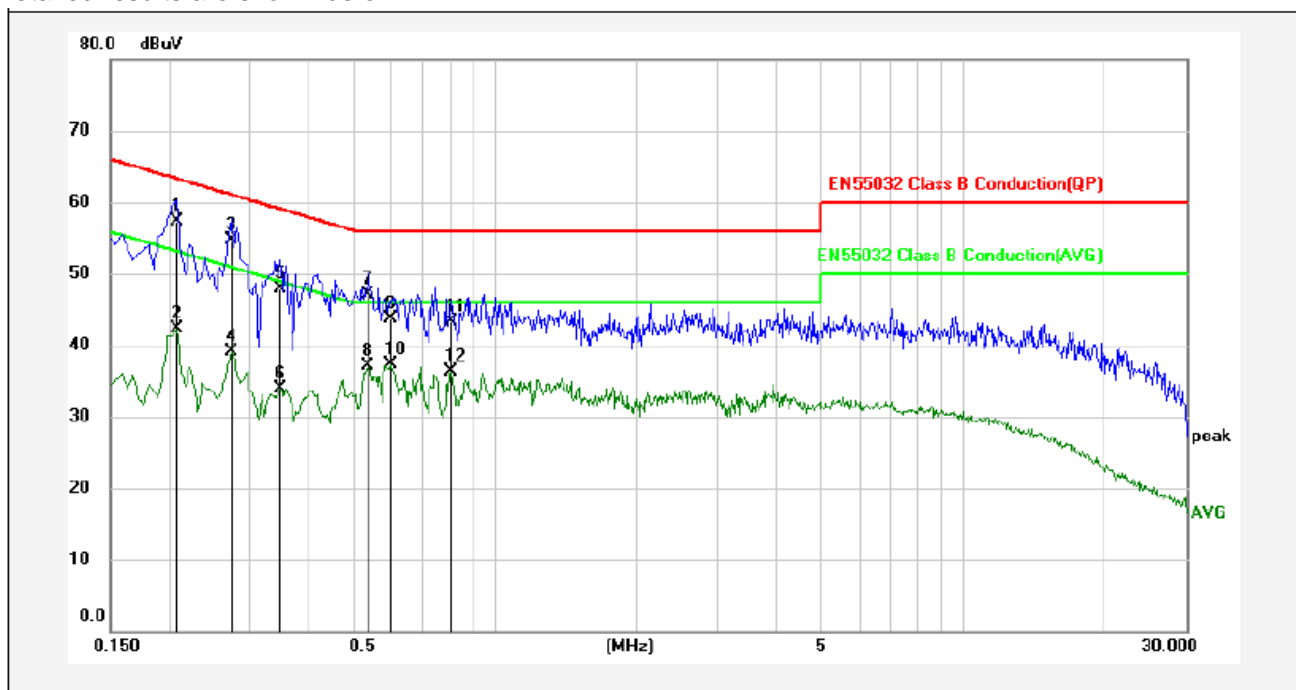


5.1.6 Test Data

EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 230Vac,50Hz
 Phase: Live
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2085	47.44	9.56	0.23	57.23	63.26	-6.03	QP	
2	0.2085	32.59	9.56	0.23	42.38	53.26	-10.88	AVG	
3	0.2714	44.88	9.52	0.24	54.64	61.07	-6.43	QP	
4	0.2714	29.25	9.52	0.24	39.01	51.07	-12.06	AVG	
5	0.3477	38.12	9.51	0.24	47.87	59.02	-11.15	QP	
6	0.3477	24.21	9.51	0.24	33.96	49.02	-15.06	AVG	
7	0.5322	37.36	9.53	0.24	47.13	56.00	-8.87	QP	
8	0.5322	27.39	9.53	0.24	37.16	46.00	-8.84	AVG	
9	0.5954	33.86	9.54	0.24	43.64	56.00	-12.36	QP	
10	0.5954	27.53	9.54	0.24	37.31	46.00	-8.69	AVG	
11	0.8067	33.42	9.57	0.23	43.22	56.00	-12.78	QP	
12	0.8067	26.44	9.57	0.23	36.24	46.00	-9.76	AVG	

Remark: The test Result=Reading+ Lisn+ Cab L.

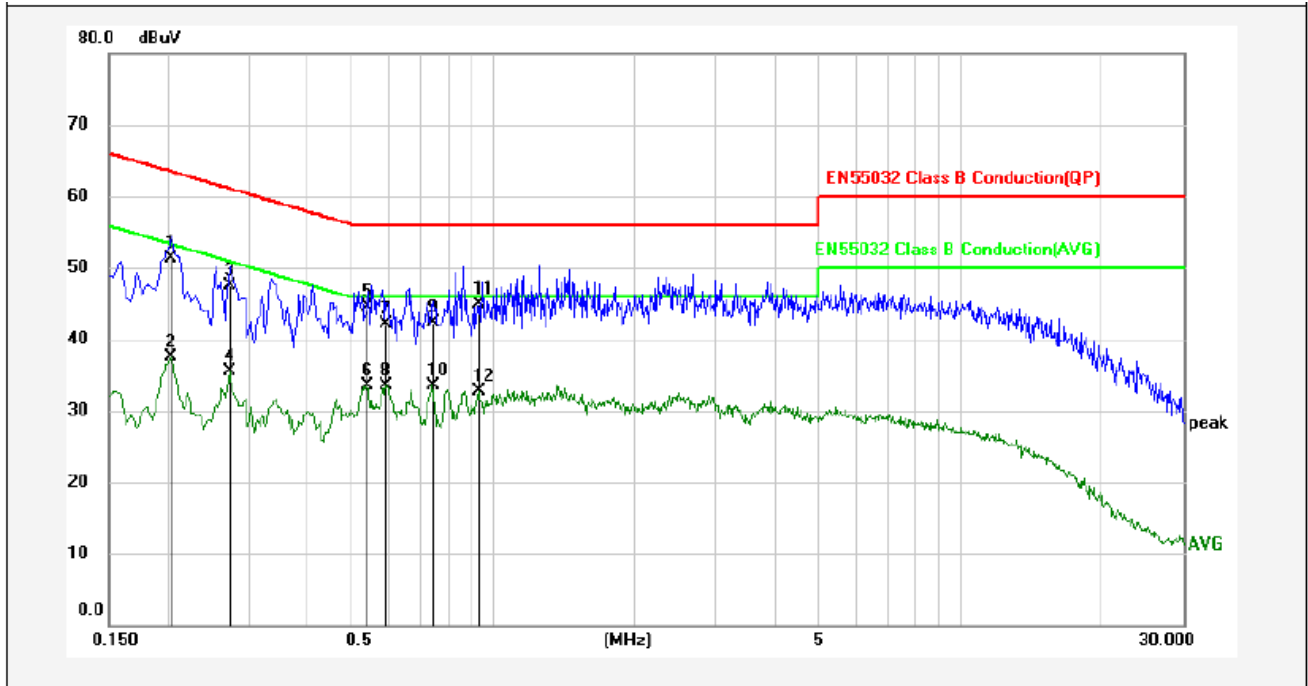
If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 230Vac,50Hz
 Phase: Neutral
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2040	41.44	9.56	0.23	51.23	63.45	-12.22	QP	
2	0.2040	27.78	9.56	0.23	37.57	53.45	-15.88	AVG	
3	0.2714	37.74	9.52	0.24	47.50	61.07	-13.57	QP	
4	0.2714	25.72	9.52	0.24	35.48	51.07	-15.59	AVG	
5	0.5369	34.78	9.53	0.24	44.55	56.00	-11.45	QP	
6	0.5369	23.80	9.53	0.24	33.57	46.00	-12.43	AVG	
7	0.5909	32.41	9.54	0.24	42.19	56.00	-13.81	QP	
8	0.5909	23.74	9.54	0.24	33.52	46.00	-12.48	AVG	
9	0.7394	32.45	9.56	0.23	42.24	56.00	-13.76	QP	
10	0.7394	23.81	9.56	0.23	33.60	46.00	-12.40	AVG	
11	0.9284	35.18	9.59	0.23	45.00	56.00	-11.00	QP	
12	0.9284	22.91	9.59	0.23	32.73	46.00	-13.27	AVG	

Remark: The test Result=Reading+ Lisn+ Cab L.

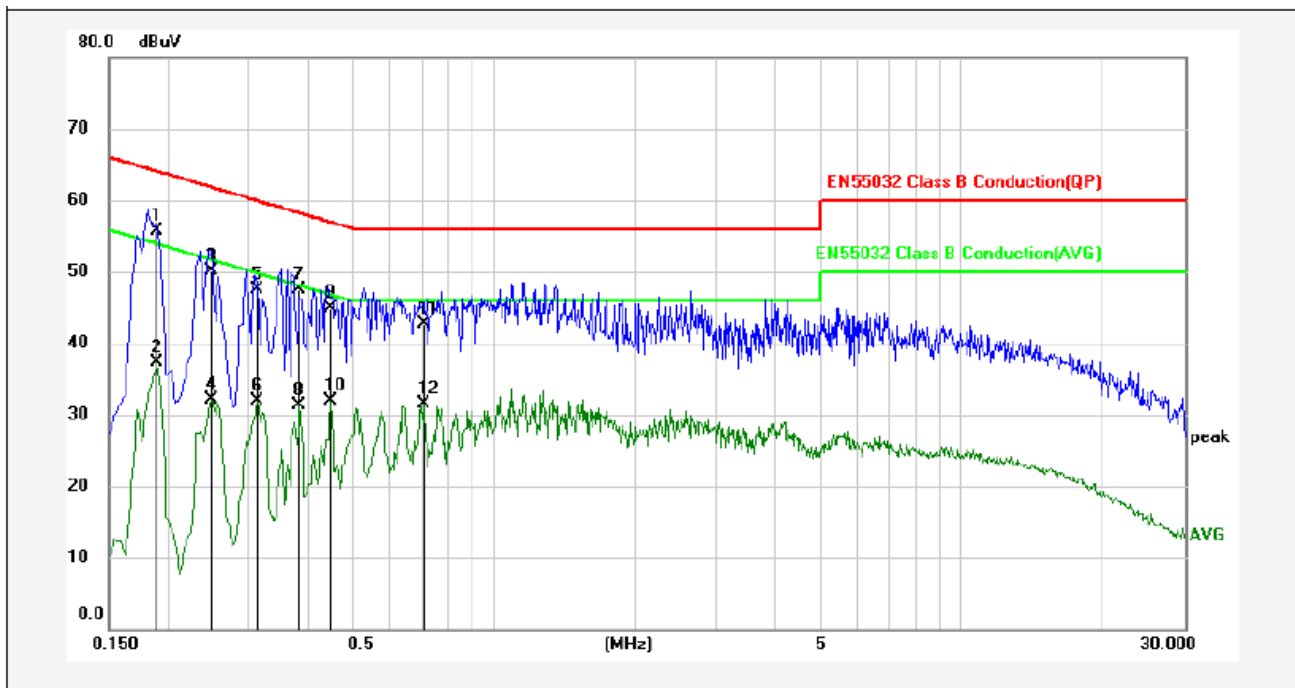
If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 110Vac,60Hz
 Phase: Neutral
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1905	45.85	9.57	0.23	55.65	64.01	-8.36	QP	
2	0.1905	27.51	9.57	0.23	37.31	54.01	-16.70	AVG	
3	0.2490	40.40	9.53	0.23	50.16	61.79	-11.63	QP	
4	0.2490	22.32	9.53	0.23	32.08	51.79	-19.71	AVG	
5	0.3120	37.76	9.5	0.24	47.50	59.92	-12.42	QP	
6	0.3120	22.12	9.5	0.24	31.86	49.92	-18.06	AVG	
7	0.3840	37.73	9.51	0.24	47.48	58.19	-10.71	QP	
8	0.3840	21.61	9.51	0.24	31.36	48.19	-16.83	AVG	
9	0.4470	35.13	9.52	0.24	44.89	56.93	-12.04	QP	
10	0.4470	22.19	9.52	0.24	31.95	46.93	-14.98	AVG	
11	0.7079	32.92	9.56	0.23	42.71	56.00	-13.29	QP	
12	0.7079	21.68	9.56	0.23	31.47	46.00	-14.53	AVG	

Remark: The test Result=Reading+ Lisn+ Cab L.

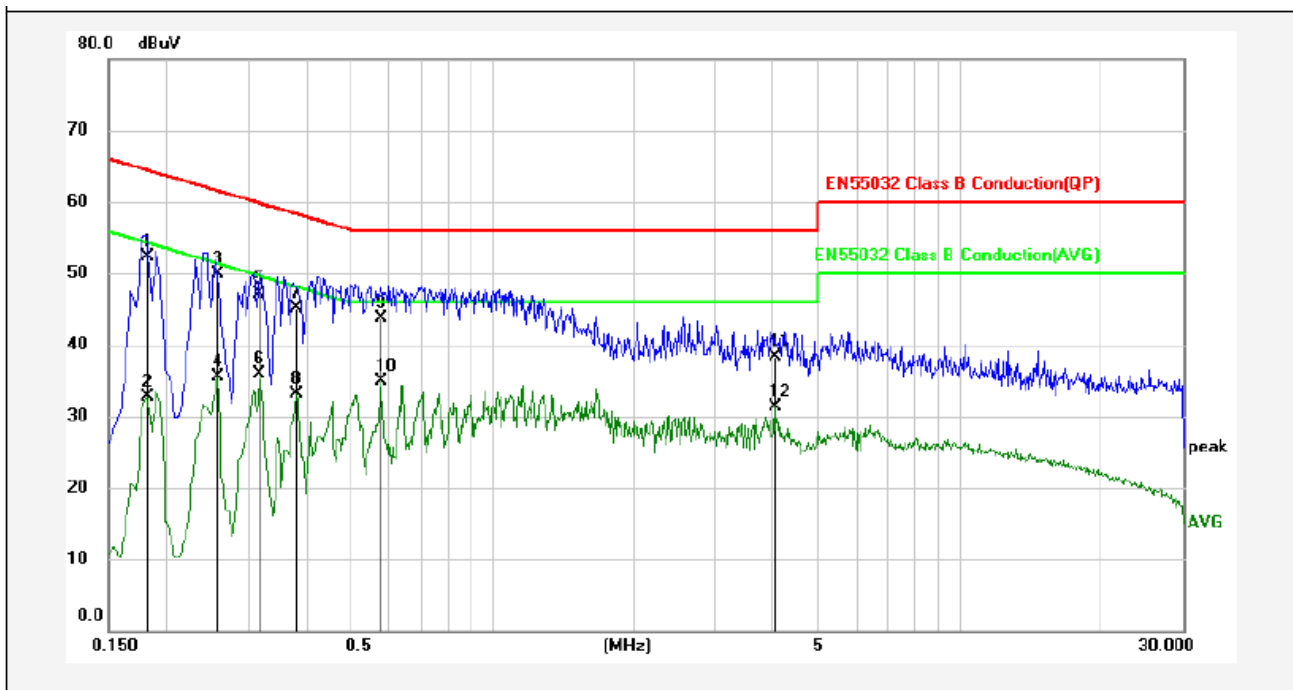
If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 110Vac,60Hz
 Phase: Live
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1815	42.58	9.58	0.22	52.38	64.42	-12.04	QP	
2	0.1815	22.92	9.58	0.22	32.72	54.42	-21.70	AVG	
3	0.2580	40.11	9.53	0.23	49.87	61.50	-11.63	QP	
4	0.2580	25.78	9.53	0.23	35.54	51.50	-15.96	AVG	
5	0.3165	37.29	9.5	0.24	47.03	59.80	-12.77	QP	
6	0.3165	26.11	9.5	0.24	35.85	49.80	-13.95	AVG	
7	0.3795	35.28	9.51	0.24	45.03	58.29	-13.26	QP	
8	0.3795	23.28	9.51	0.24	33.03	48.29	-15.26	AVG	
9	0.5774	33.90	9.54	0.24	43.68	56.00	-12.32	QP	
10	0.5774	25.05	9.54	0.24	34.83	46.00	-11.17	AVG	
11	4.0155	28.39	9.7	0.21	38.30	56.00	-17.70	QP	
12	4.0155	21.49	9.7	0.21	31.40	46.00	-14.60	AVG	

Remark: The test Result=Reading+ Lisn+ Cab L.

If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



5.2 Radiated Emissions

5.2.1 Specification Reference

EN 55032:2015, Clause Annex A.2

5.2.2 Environmental Conditions

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 27, 2020	23.7°C	52%	101.5kPa

5.2.3 Limits

Radiated Emissions Limits (Class B) Below 1 GHz		
Frequency Range (MHz)	Distance 3m	Distance 10M
	Quasi-peak (dB μ V/m)	Quasi-peak (dB μ V/m)
30 - 230	40	30
230 - 1000	47	37

Radiated Emissions Limits Above 1 GHz		
Frequency Range (MHz)	Average (dB μ V/m)	Peak (dB μ V/m)
1000 - 3000	50	70
3000 - 6000	54	74

Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades

5.2.4 Test Setup & Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive.

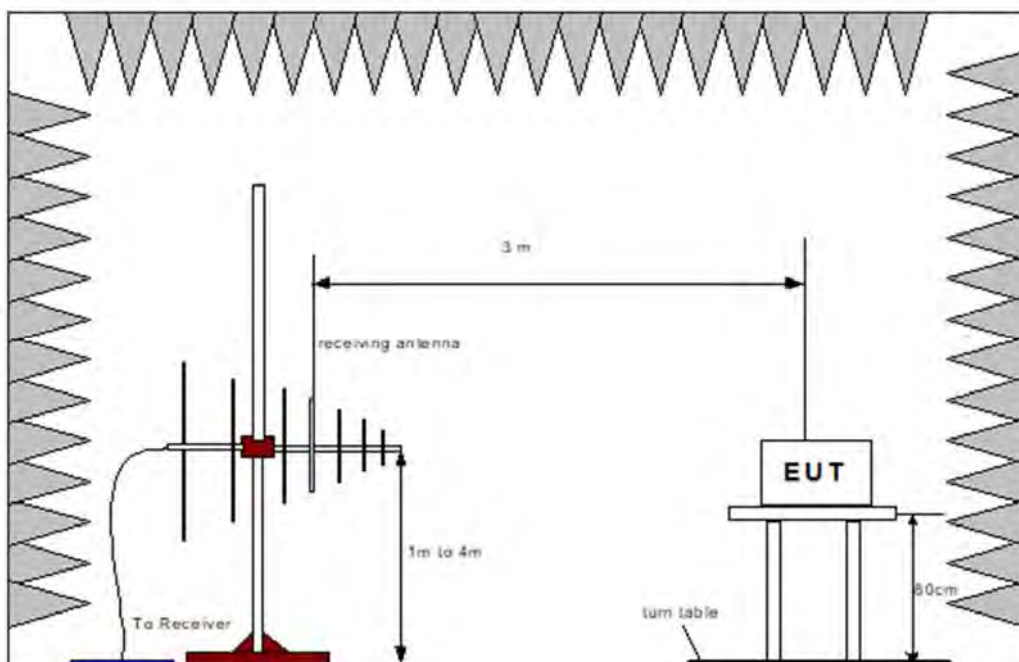
< Table 0.8 m above a reference ground plane >

< Support 0.1 m above a reference ground plane >

A prescan of the EUT emissions profile was made while varying the antennae-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 3m distance.

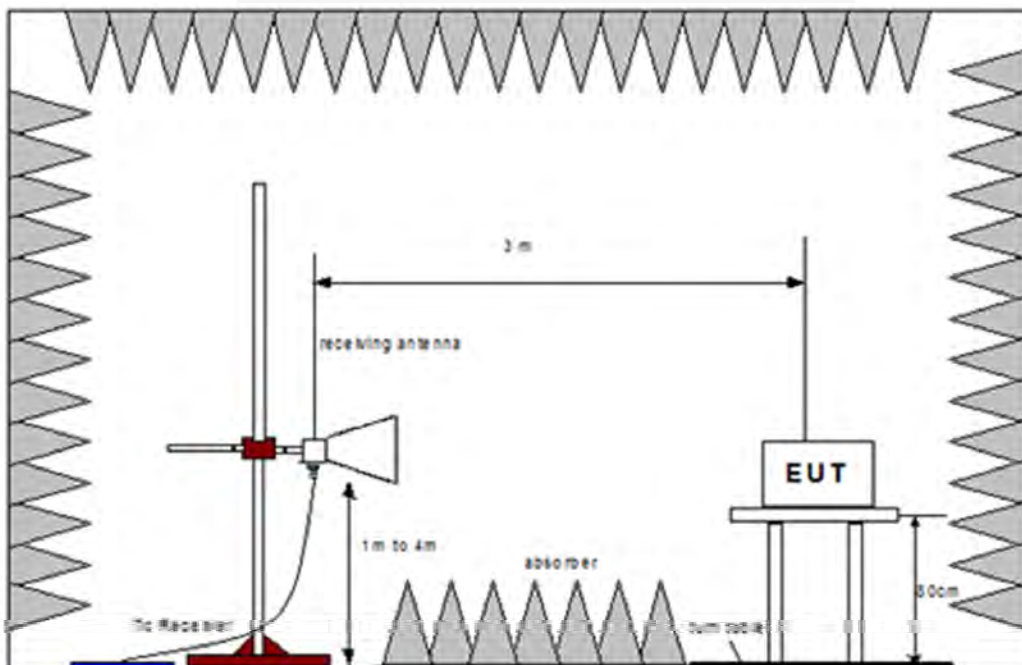
Using the prescan list of the highest emissions detected, their bearing and associated antenna polarization, the EUT was then formally measured using Quasi-Peak and Average detectors, as appropriate. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification.

Below 1 GHz



The bandwidth of the test receiver (R&S Test Receiver) is set at 120kHz.
The frequency range from 30MHz to 1000MHz is checked.

Above 1 GHz



The bandwidth of the test receiver (R&S Test Receiver) is set at 1MHz.
The frequency range from above 1000MHz is checked.

5.2.5 Conducted Disturbance at Mains Terminals Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

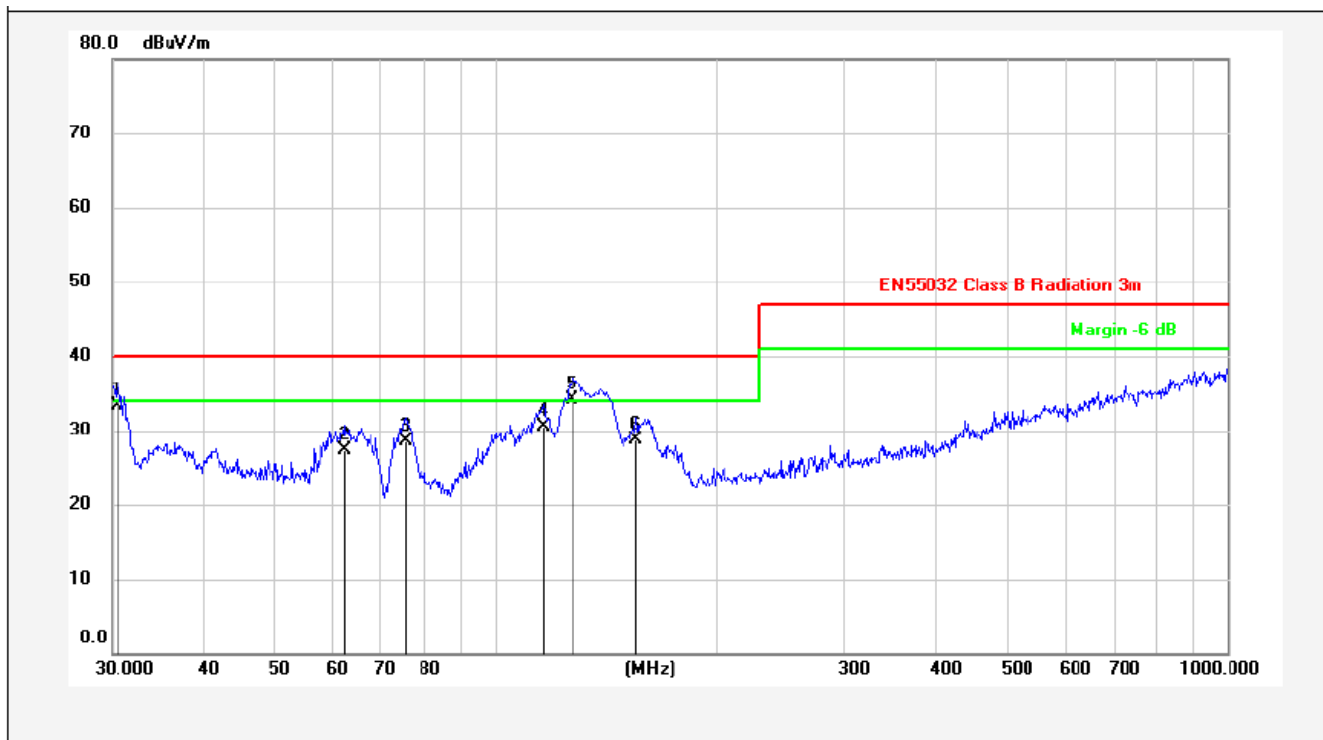


5.2.6 Test Data

EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 230Vac,50Hz
 Ant. Pol.: Vertical
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.4237	20.15	11.84	1.33	33.32	40.00	-6.68	QP
2	62.2128	13.97	11.91	1.5	27.38	40.00	-12.62	QP
3	75.4462	18.28	8.59	1.73	28.60	40.00	-11.40	QP
4	116.5400	16.63	11.78	2.13	30.54	40.00	-9.46	QP
5	127.6645	21.91	9.87	2.31	34.09	40.00	-5.91	QP
6	155.9100	17.39	8.75	2.51	28.65	40.00	-11.35	QP

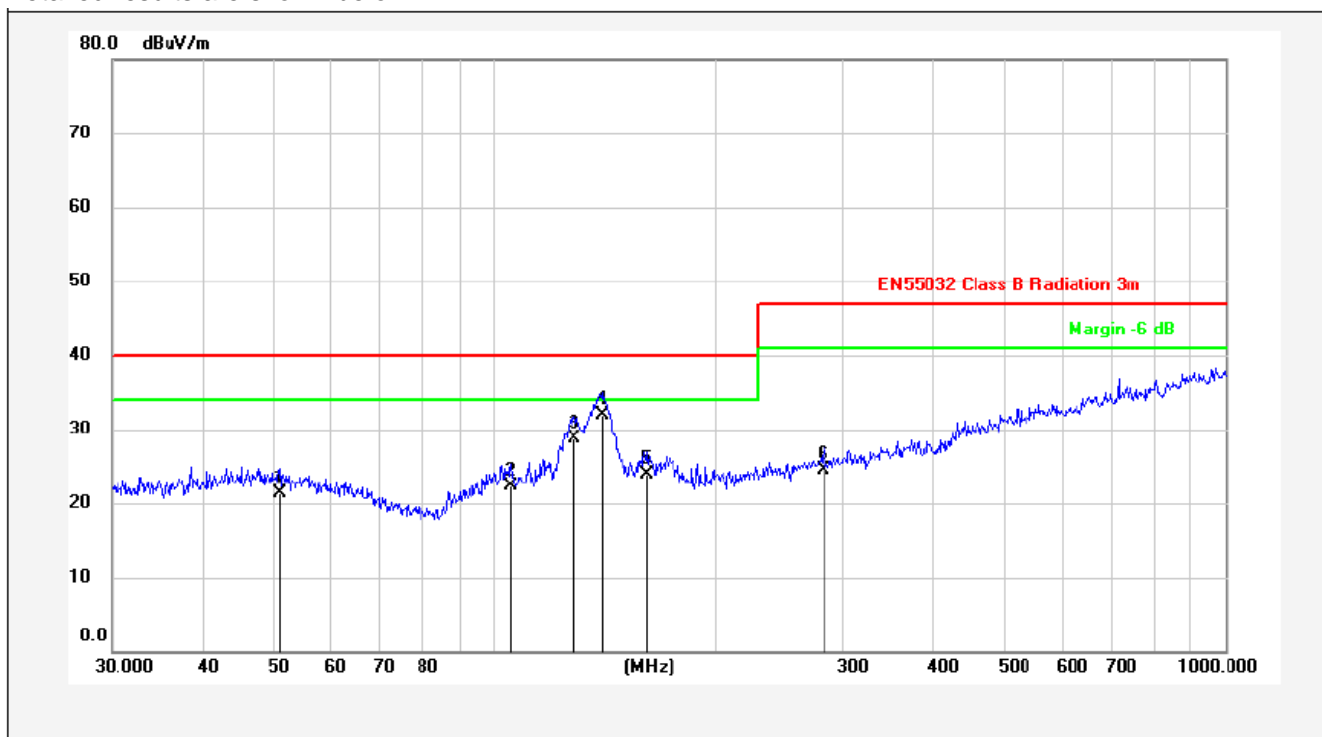
Remarks: 1. Result=Reading+ Antenna+ Cable
 2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 230Vac,50Hz
 Ant. Pol.: Horizontal
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	50.9420	5.91	13.96	1.52	21.39	40.00	-18.61	QP
2	105.2716	7.78	12.47	2.12	22.37	40.00	-17.63	QP
3	128.5629	16.71	9.69	2.31	28.71	40.00	-11.29	QP
4	140.8351	20.23	9.27	2.43	31.93	40.00	-8.07	QP
5	162.0414	12.17	9.08	2.59	23.84	40.00	-16.16	QP
6	281.9945	8.05	13.14	3.3	24.49	47.00	-22.51	QP

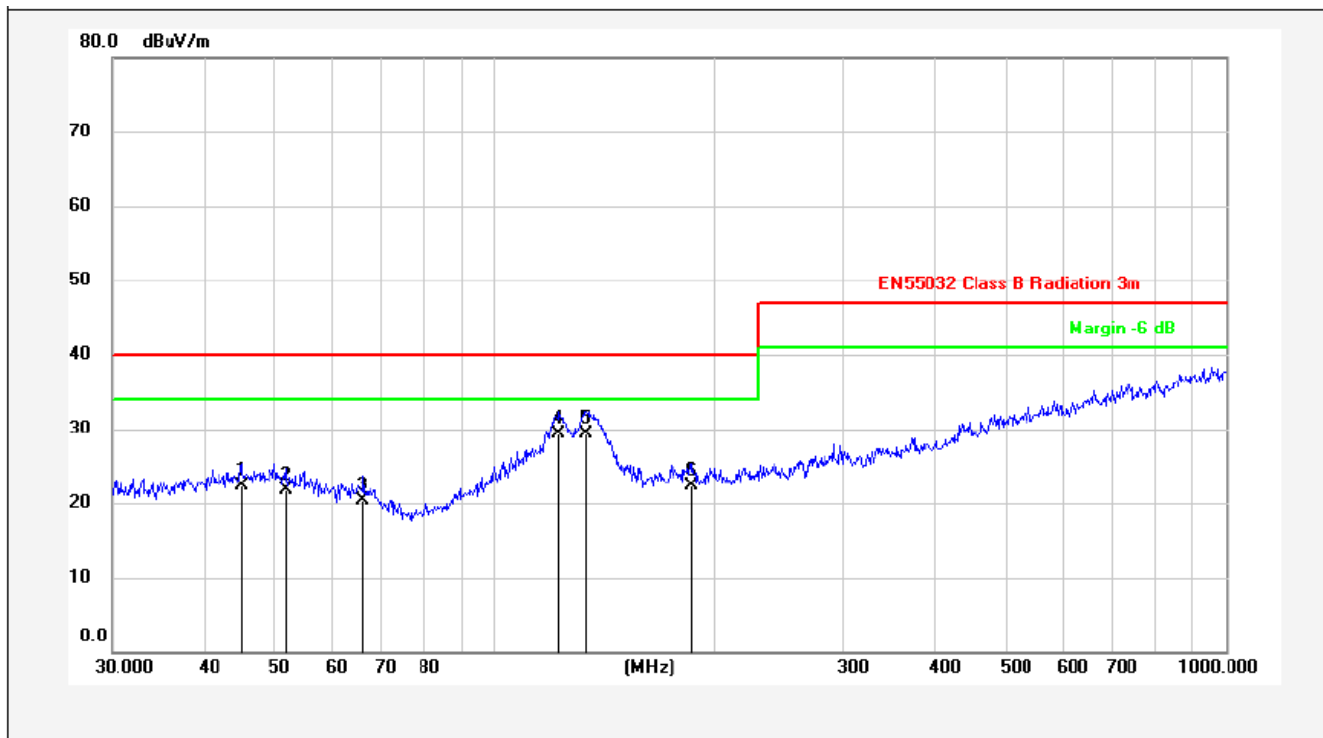
Remarks: 1. Result=Reading+ Antenna+ Cable
 2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 110Vac,60Hz
 Ant. Pol.: Horizontal
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	45.0583	6.68	14.12	1.46	22.26	40.00	-17.74	QP
2	51.8430	6.29	13.82	1.51	21.62	40.00	-18.38	QP
3	66.0341	7.29	11.47	1.62	20.38	40.00	-19.62	QP
4	122.4039	16.10	10.97	2.22	29.29	40.00	-10.71	QP
5	133.6188	17.94	9.11	2.3	29.35	40.00	-10.65	QP
6	186.4408	9.11	10.49	2.76	22.36	40.00	-17.64	QP

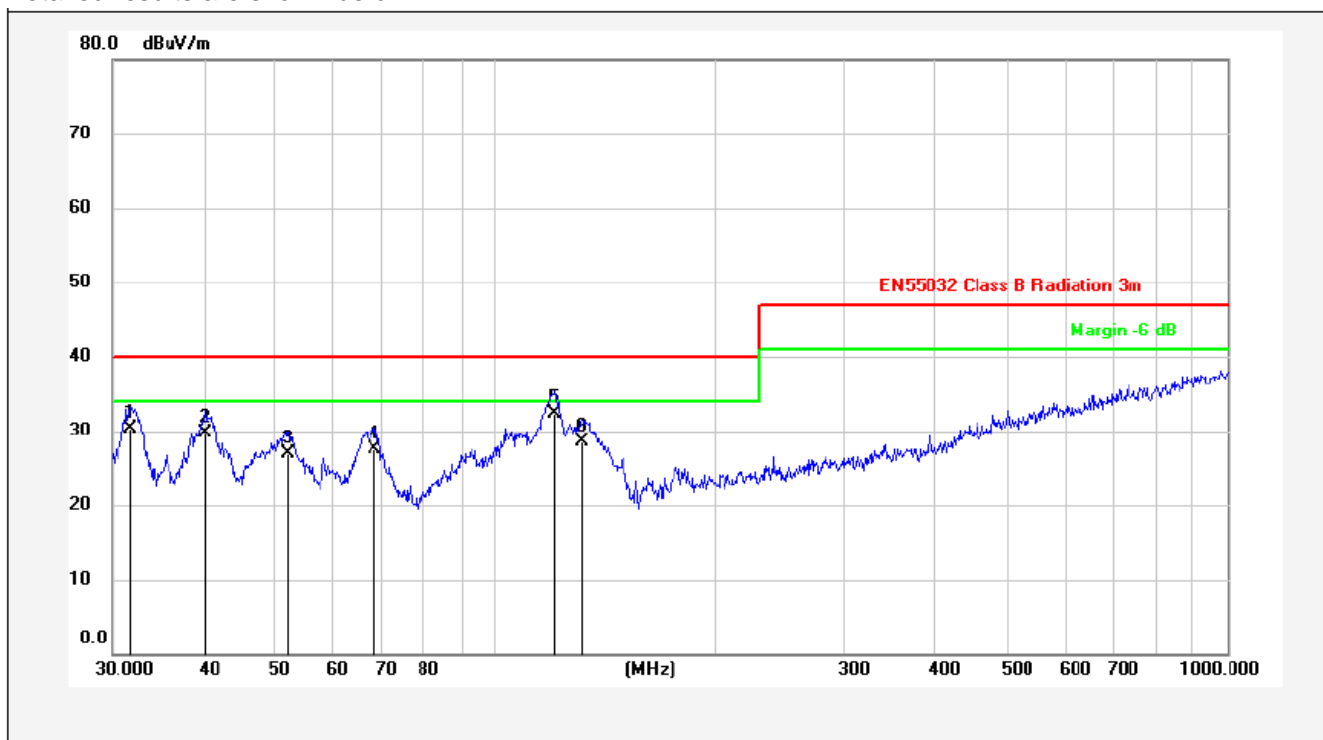
Remarks: 1. Result=Reading+ Antenna+ Cable
 2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.



EUT: AC ADAPTER
 M/N: HJ-AD10-050210
 Test Voltage: 110Vac,60Hz
 Ant. Pol.: Vertical
 Test Mode: Full Load

Note:

Detailed results are shown below



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.8427	16.93	11.98	1.32	30.23	40.00	-9.77	QP
2	40.1347	15.03	13.25	1.36	29.64	40.00	-10.36	QP
3	52.2079	11.70	13.76	1.5	26.96	40.00	-13.04	QP
4	68.3908	15.10	10.71	1.62	27.43	40.00	-12.57	QP
5	120.6991	18.84	11.35	2.16	32.35	40.00	-7.65	QP
6	131.7577	17.02	9.26	2.31	28.59	40.00	-11.41	QP

Remarks: 1. Result=Reading+ Antenna+ Cable
 2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.

5.3 Harmonic current emission

5.3.1 Specification Reference

EN 61000-3-2: 2014 Clause 7
 Limits for Class A equipment

5.3.2 Equipment Under Test

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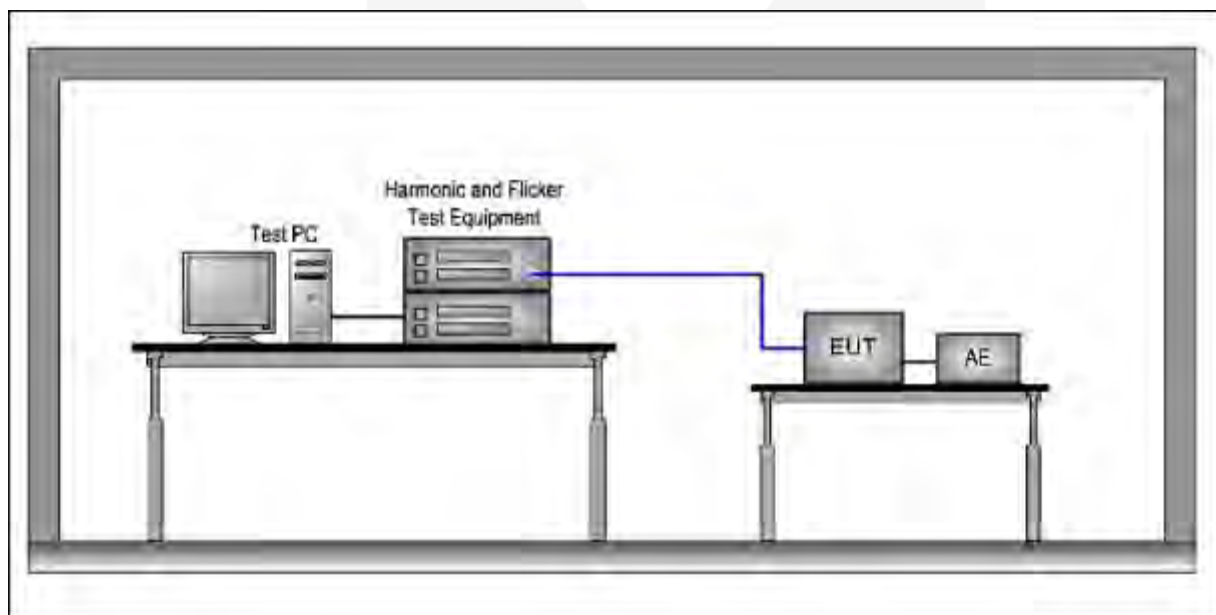
5.3.3 Environmental Conditions

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
--	-- °C	-- %	-- kPa

5.3.4 Test Setup & Test Method

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.





5.3.5 Classification of equipment

For the purpose of harmonic current limitation, equipment is classified as follows:

Class A:

For the purpose of harmonic current limitation, equipment is classified as follows:

Class A: Equipment not specified as belonging to Class B, C or D shall be considered as Class A equipment.

Some examples of Class A equipment are:

- Balanced three-phase equipment;
- Household appliances, excluding those specified as belonging to Class B, C or D;
- Vacuum cleaners;
- High pressure cleaners;
- Tools, excluding portable tools;
- Independent phase control dimmers;
- Audio equipment;
- Professional luminaires for stage lighting and studios.

Class B:

- Portable tools;
- Arc welding equipment which is not professional equipment.

Class C:

- lighting equipment.

Class D:

Equipment having a specified power according to EN 61000-3-2: 2014 Clause 6.3.2, less than or equal to 600 W, of the following types:

- Personal computers and personal computer monitors;
- Television receivers;
- Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).



5.3.6 Limits

Remark: If the EUT power level is below 75 Watts and therefore has no defined limits.

Limits for Class A equipment	
Harmonic order	Maximum permissible harmonic current
n	A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \ 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \ 8/n$

Limits for Class D equipment		
Harmonic order	Maximum permissible harmonic current per watt	Maximum permissible harmonic current
n	mA/W	A
Odd harmonics		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
$13 \leq n \leq 39$ (odd harmonics only)	$3.85/n$	$0.15 \ 15/n$



5.3.7 Test Results

Pass

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2;

For further details, please refer to Clause 7, Note1 of EN 61000-3-2 which states:
“For the following categories of equipment limits are not specified in this edition of the standard.
Note 1: Equipment with a rated power of 75W or less, other than lighting equipment.”



5.4 Voltage Fluctuations-Flicker

5.4.1 Specification Reference

EN 61000-3-3:2013/A1:2019, Clause 5

5.4.2 Equipment Under Test

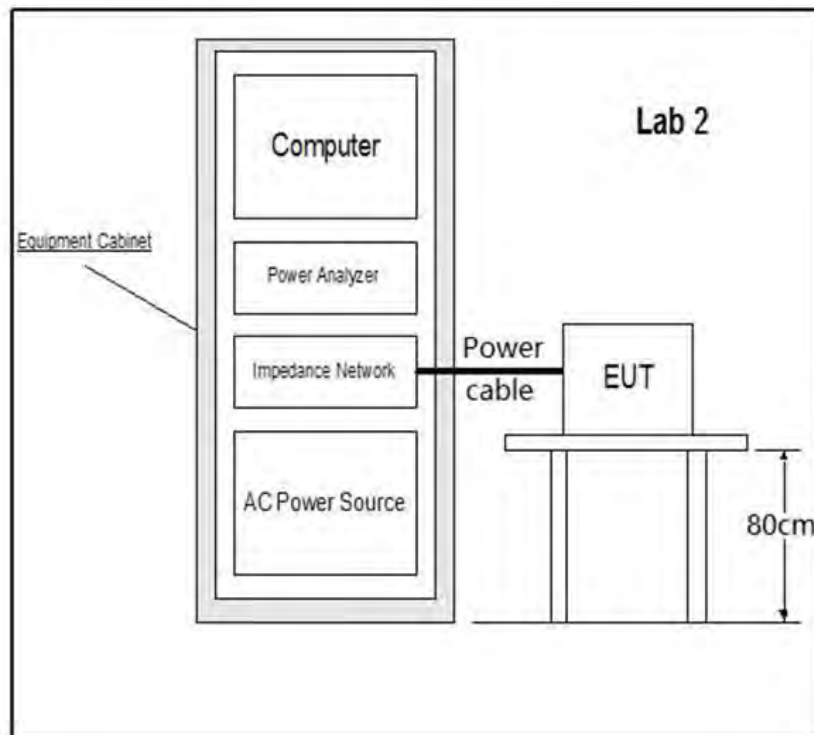
--

5.4.3 Environmental Conditions

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
--	-- °C	--%	-- kPa

5.4.4 Test Setup & Test Method

For equipment not mentioned in annex A, controls or automatic programs should be set to produce the most unfavourable sequence of voltage change, using only those combinations of controls and programmes which are mentioned by the manufacturer in the instruction manual, or are otherwise likely to be used



5.4.5 Limits

Test Item	Limit	Note
Pst	1.0	Pst means Short-term flicker indicator
Plt	0.65	Plt means long-term flicker indicator
Tmax	500ms	Tmax means maximum time that d(t) exceeds 3.3%
dmax(%)	4%	dmax means maximum relative voltage change.
dc(%)	3.3%	dc means relative steady-state voltage change.



5.4.6 Test Results

Pass

This EUT is unlikely to produce significant voltage fluctuations or flicker by examination of the circuit diagram and specification of it. So it is deemed to fulfil the requirements without test





6. Immunity Test Result

Performance criteria for EN 55035

The performance criteria are based on the general criteria of the standard and derived from the product specification

Criterion A:

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion B:

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Criterion C:

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



Basic EMC standard for immunity test

IEC/EN 61000-4-2: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 2: electrostatic discharge immunity test

IEC/EN 61000-4-3: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 3: radiated, radio frequency, electromagnetic field immunity test

IEC/EN 61000-4-4: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 4: electric fast transient/burst immunity test

IEC/EN 61000-4-5: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 5: surge immunity test

IEC/EN 61000-4-6: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 6: immunity to conducted disturbance, induced by radio frequency field

IEC/EN 61000-4-8: Electromagnetic compatibility (EMC) — Part 4: testing and measurement techniques — Section 8: Power frequency magnetic field immunity test.

IEC/EN 61000-4-11: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 11: voltage dips, short interruption and voltage variations immunity test

Note: For the above standards, the latest edition (including any amendments) applies.

6.1 Electrostatic Discharge (ESD)

6.1.1 Specification Reference

EN 55035:2017, Clause 10 Table, 1.4
EN 61000-4-2:2009

6.1.2 Test Setup & Test Method

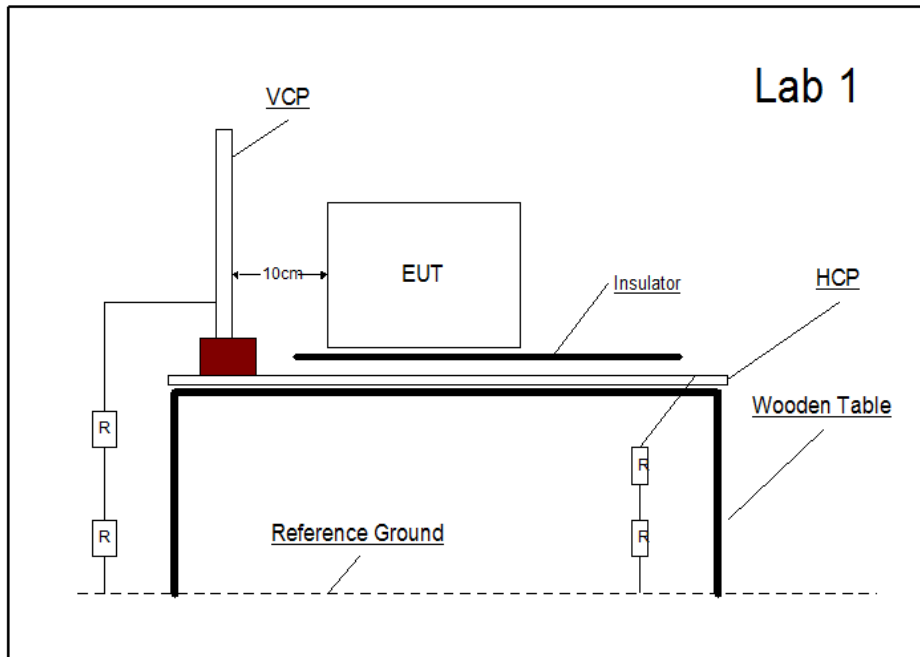


Table-top equipment

VCP: Vertical Coupling Plane 0.5 x 0.5 mm HCP: Horizontal Coupling Plane 0.95 x 1.6 mm

R. Ground: 2 x 2 mm

R: 470 K Ω

The equipment under test including associated cabling was configured on but insulated from, using a 0.5mm isolator, a horizontal coupling plane fitted to the top of a 0.8 m non-conductive table for table-top equipment; and on a 0.1 m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed.

Contact Discharge:

All the procedure was same as Section 8.5.1. Except that the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. The tip of the discharge electrode was touch the EUT before the discharge switch was operated.

Indirect discharge for horizontal coupling plane:

At least 20 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.



Indirect discharge for vertical coupling plane:

At least 20 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

For the time interval between successive single discharges an initial value of one second. After discharge to the ungrounded part of EUT, it needs the bleeder resistor to remove the charge prior to next ESD pulse.

During this testing any anomalies in the equipment under tests performance was recorded.

6.1.3 Limits

Required Test Levels				
Discharge type	Discharge Level (kV)		Number of discharges per location (each)polarity	Performance Criteria
	Positive	Negative		
Air – Direct	2, 4 and 8	2, 4 and 8	see note 1	B
Contact – Direct	4	4	see note 1	B
Contact – Indirect	4	4	see note 1	B

Supplementary information:
 Note 1. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. For table-top equipment one of the test points shall be the center front edge of the horizontal coupling plane, which shall be subjected to at least 50 indirect discharges (25 of each polarity).



6.1.4 Test Results

Performance assessment of the EUT made during this test: Pass Detailed results are shown below.

Electrostatic Discharge Test Results

EUT	:	AC ADAPTER	Test Date	:	2021.01.27
M/N	:	HJ-AD10-050210	Test Mode	:	Full Load
Test Voltage	:	230Vac,50Hz	Temperature	:	22.3°C
Humidity	:	51%	Pressure	:	101.5kPa
Air Discharge:	±8kV	For Air Discharge each Point Positive 10 times and negative 10 times discharge			
Contact Discharge:	±4kV	For Contact Discharge each point positive 10 times and negative 10 times discharge			
Discharge Voltage (kV)	Type of discharge	Dischargeable Points	Performance		Result (Pass/Fail)
			Required	Observation	
±4	Contact	Center of VCP	B	A	Pass
±4	Contact	Center of HCP	B	A	Pass
±2, ±4	Contact	1	B	A	Pass
±2, ±4, ±8	Air	2	B	A	Pass
Discharge Points Description					
1	DC output port		8	--	
2	Slot		9	--	
3	--		10	--	
4	--		11	--	
5	--		12	--	
6	--		13	--	
7	--		14	--	
Performance: The EUT was no change compared with initial operation during the test.					

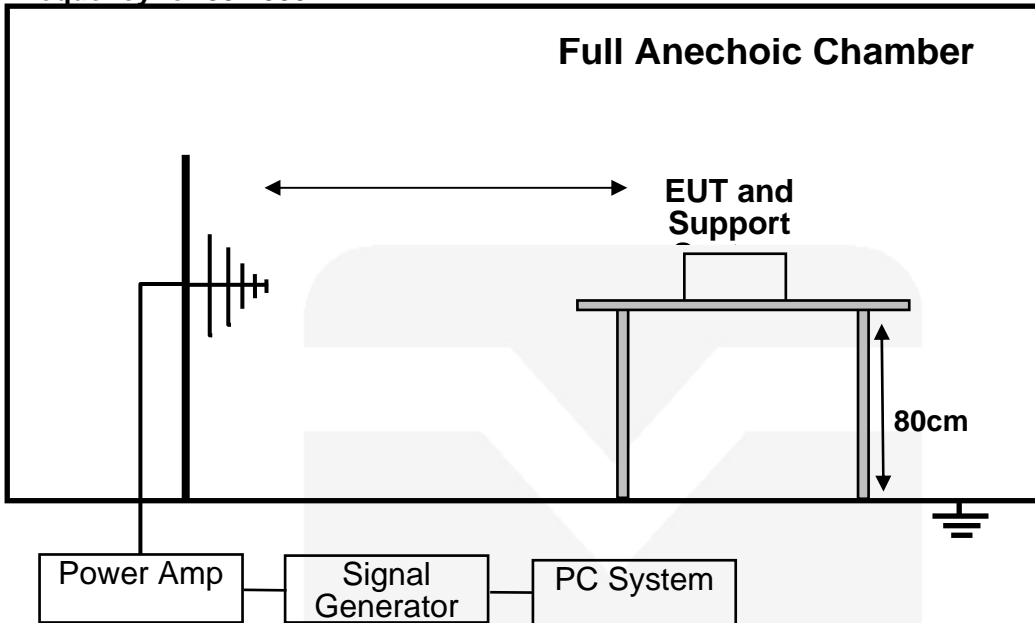
6.2 Electromagnetic field immunity (RS)

6.2.1 Specification Reference

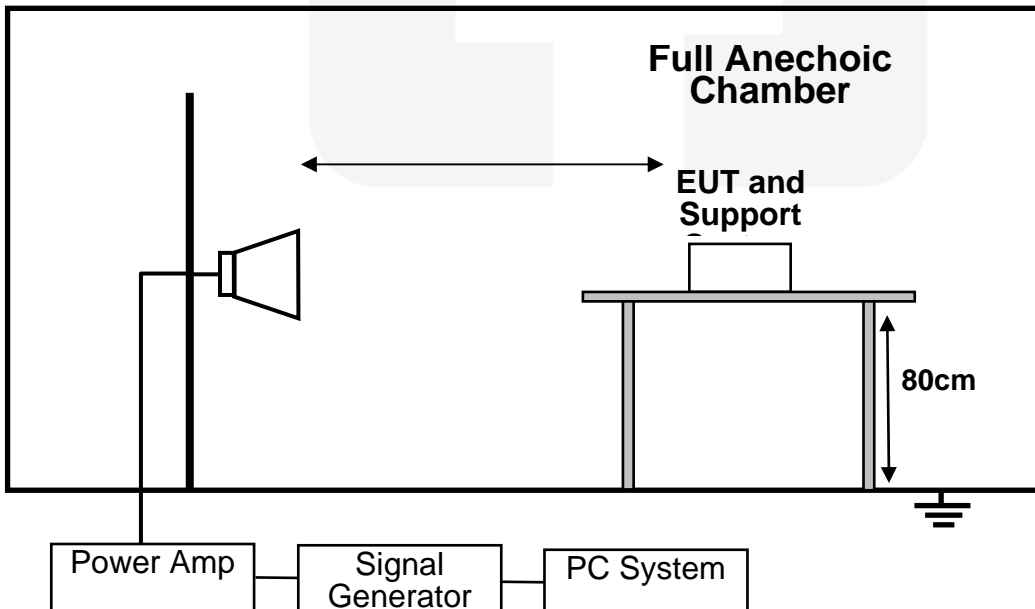
EN 55035:2017, Clause 5, Table 1, 1.2&1.3
EN 61000-4-3:2006+A1:2008+A2:2010

6.2.2 Test Setup & Test Method

Frequency for 80-1000MHz



Frequency for 1-6GHz



The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment; with a pre-calibrated semi anechoic chamber.

All four sides of the equipment under test were subjected to the required RF field strength, modulated as described, swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarizations.



During this testing any anomalies in the equipment under tests performance was recorded.

6.2.3 Limits

Required Test Levels					
Frequency Range (MHz)	Level (V/m)	Modulation	Step Size (%)	Dwell (s)	Performance Criteria
80 to 1000	3	AM (80 %,1 kHz, sine wave)	1	>1	A
1800 2600 3500 5000	3	AM (80 %,1 kHz, sine wave)	1	>1	A

Supplementary information:
 Note 1. EUT powered at one of the Nominal input voltages and frequencies

6.2.4 Test Results

EUT	:	AC ADAPTER	Test Date	:	2021.01.27
M/N	:	HJ-AD10-050210	Test Mode	:	Full Load
Test Voltage	:	230Vac,50Hz	Temperature	:	23°C
Humidity	:	54%	Pressure	:	101.5kPa
Test Level	:	3 V/m	Dwell Time	:	3 s
Modulation	:	AM (80 %,1 kHz, sine wave)	Step Size (%)	:	1
Test Frequency Range	Side of the equipment under test	Antenna polarization (Vertical/Horizontal)	Performance		Result (Pass/Fail)
			Required	Observation	
80-1000 MHz	All sides	Vertical& Horizontal	A	A	Pass
1800MHz 2600MHz 3500MHz 5000MHz	All sides	Vertical& Horizontal	A	A	Pass

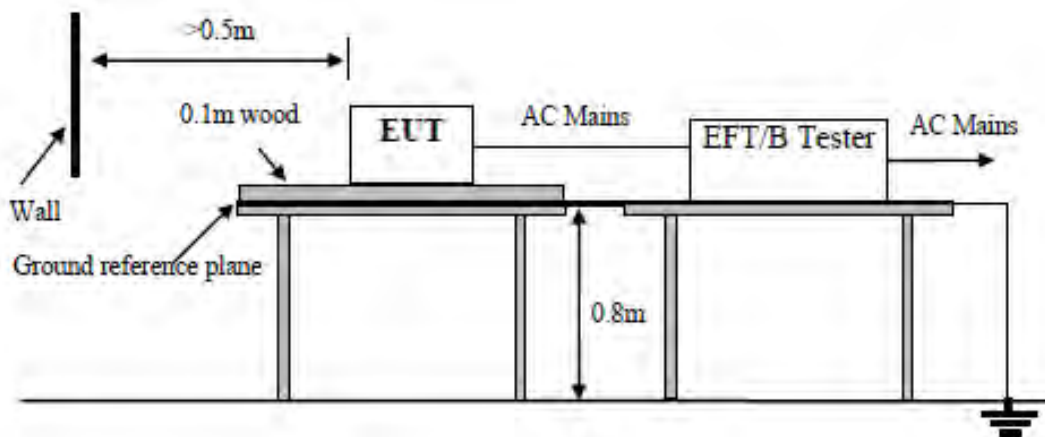
Performance:
 There was no change compared with initial operation during the test.

6.3 Electric Fast Transient/Burst Immunity (EFT)

6.3.1 Specification Reference

EN 55035:2017, Clause 5, Table 4, 4.5
 EN 61000-4-4:2012

6.3.2 Test Setup & Test Method



The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. The length of signal and power cable between EUT and EFT generator was 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

During this testing any anomalies in the equipment under tests performance was recorded

6.3.3 Limits

Open Circuit Output Test Voltage ±10%			
Severity Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control Lines, DC Line	Performance criterion
1.	0.5KV	0.25KV	B
2.	1KV	0.5KV	
3.	2KV	1KV	
4.	4KV	2KV	
X	Special	Special	

The use of 5 kHz repetition frequency is traditional, however, 100 kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. With some products, there may be no clear distinction between power ports and signal ports, in which case it is up to product committees to make this determination for test purposes.

a "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.



6.3.4 Test Results

Results for Configuration and Mode: Full load.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

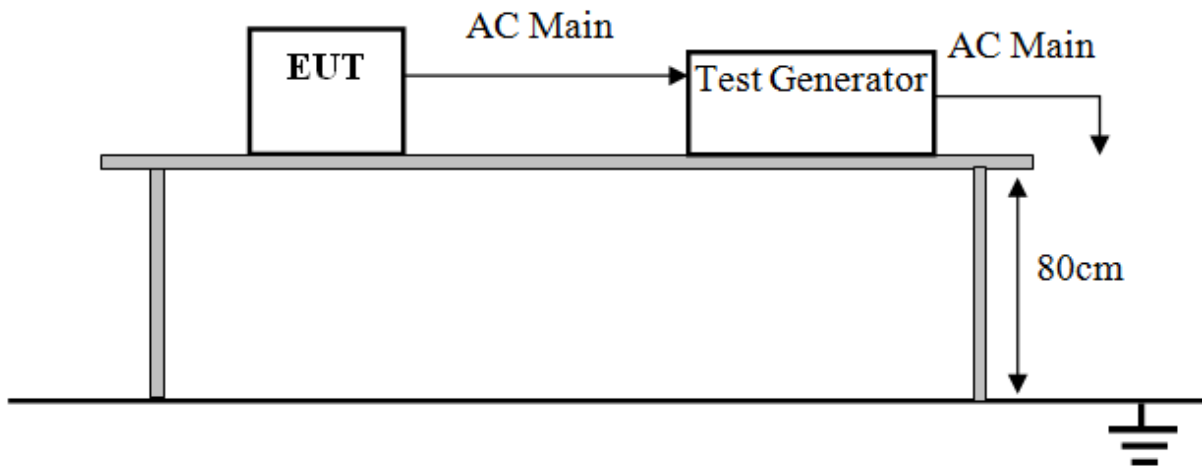
EUT	: AC ADAPTER	Test Date	: 2021.01.27	
M/N	: HJ-AD10-050210	Test Mode	: Full Load	
Test Voltage	: 230Vac,50Hz	Temperature	: 22.8℃	
Humidity	: 53%	Pressure	: 101.5kPa	
Repetition Frequency	: 5kHz	Burst Duration	: 15ms	
		Burst Period	: 300ms	
Inject Time(s):	120s	Inject Method:	Inject Line:	
		<input checked="" type="checkbox"/> Direct <input type="checkbox"/> Capacitive Clamp	<input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> Signal	
Line	Test Voltage	Performance		Result
		Required	Observation	(Pass/Fail)
L	--	--	--	--
N	--	--	--	--
L-N	±1.0kV	B	A	Pass
PE	--	--	--	--
L-PE	--	--	--	--
N-PE	--	--	--	--
L-N-PE	--	--	--	--
Signal Line	--	--	--	--
DC output Line	--	--	--	--
Performance: There was no change compared with initial operation during the test.				

6.4 Surge Immunity

6.4.1 Specification Reference

EN 55035:2017, Clause 5, Table 4,4.4
 EN 61000-4-5:2014+A1:2017

6.4.2 Test Setup & Test Method



The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using CDNs for power ports and appropriate coupling methods for applicable signal and control ports, the required number of surges was applied for each surge voltage level using both positive and negative surge voltage polarities. Surges were applied at the power line frequency phase angles and repartition rates detailed.

During this testing any anomalies in the equipment under tests performance was recorded

6.4.3 Limits

Required Test Levels					
Line Under Test	Level (kV)	Surge Waveform	Phase Angles (°)	Number of Pulse	Performance Criteria
AC Power Port	± 1 (Line to Line) ± 2 (Line to Earth)	1.2/50 (8/20)	+90, -270	5 per polarity	B
Control and Signal Line, DC Line	± 0.5 (Line to Line) ± 0.5 (Line to Earth)	1.2/50 (8/20)	+90, -270	5 per polarity	B

Supplementary information:
 Note 1. EUT powered at one of the Nominal input voltages and frequencies



6.4.4 Test Results

Results for Configuration and Mode: Full load.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

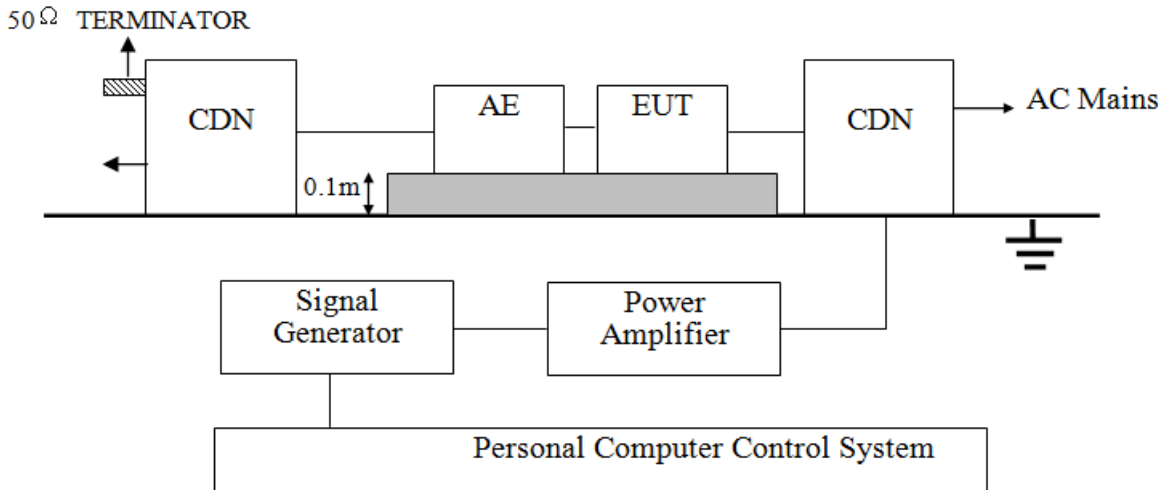
EUT	:	AC ADAPTER	Test Date	:	2021.01.27			
M/N	:	HJ-AD10-050210	Test Mode	:	Full Load			
Test Voltage	:	230Vac,50Hz	Temperature	:	22.9°C			
Humidity	:	54%	Pressure	:	101.5kPa			
Required Performance	:	B	Actual Performance	:	A			
Counts of pulse:		+5 times, -5 times	Interval	:	60 Seconds			
Line : <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Supply <input type="checkbox"/> Signal :WAN & LAN Port								
Location	Volt	500V		1kV		2kV		Result
	Phase	Performance		Performance		Performance		(Pass/Fail)
		+	-	+	-	+	-	
L-N	0°	--	--	--	--	--	--	--
	90°	A	--	A	--	--	--	Pass
	180°	--	--	--	--	--	--	--
	270°	--	A	--	A	--	--	Pass
L-N-PE	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
Signal &Control Line	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--
Performance: There was no change compared with initial operation during the test.								

6.5 Immunity to Conducted Disturbances, Induced by Radio-frequency Fields(CS)

6.5.1 Specification Reference

EN 55035:2017, Clause 5, Table 4,4.1
 EN 61000-4-6:2014

6.5.2 Test Setup & Test Method



The equipment under test was configured, on but insulated from, using a 0.1 m isolator, a horizontal coupling plane fitted to the top of a 0.8 m non-conductive table for table-top equipment; and on a 0.1 m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

All associated cabling was configured, on but insulated from, using a 50 mm isolator, the same horizontal coupling plane as the equipment under test.

Using CDNs, EM Clamps or current clamps as appropriate, the power ports and applicable signal and control ports were subjected to required, pre calibrated RF injected signal strength, modulated as described, swept over the frequency range of test.

During this testing any anomalies in the equipment under tests performance was recorded.

6.5.3 Limits

Required Test Levels						
Line Under Test	Frequency Range (MHz)	Level (V)	Modulation	Step Size (%)	Dwell (s)	Performance Criteria
AC Power Port	0.15 to 10	3	AM (80 %,1kHz,sine wave)	1	>1	A
AC Power Port	10 to 30	3 - 1	AM (80 %,1kHz, sine wave)	1	>1	A
AC Power Port	30 to 80	1	AM (80 %,1kHz, sine wave)	1	>1	A

Supplementary information:

Note 1. EUT powered at one of the Nominal input voltages and frequencies



6.5.4 Test Results

Results for Configuration and Mode: Full load.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

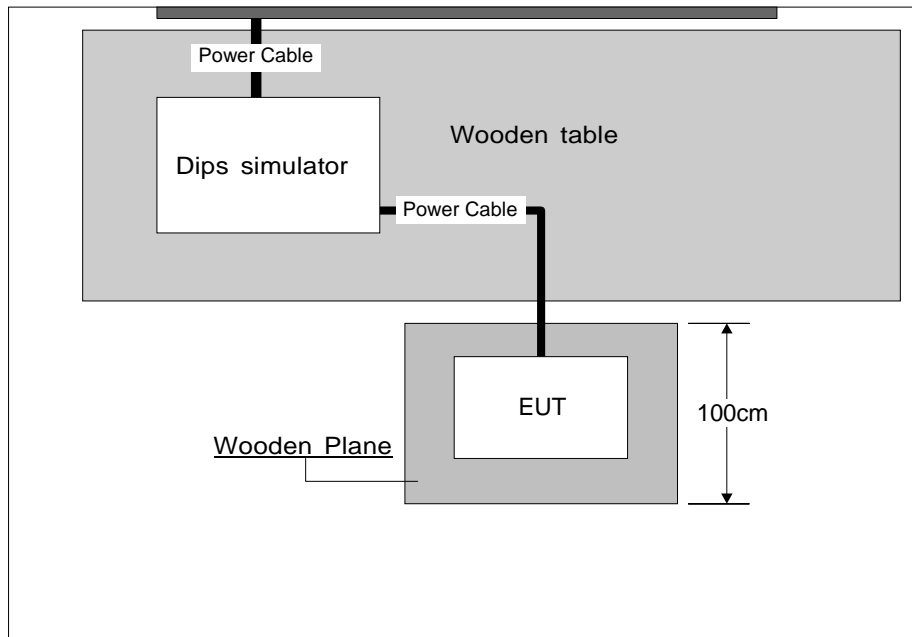
EUT	:	AC ADAPTER	Test Date	:	2021.01.27
M/N	:	HJ-AD10-050210	Test Mode	:	Full Load
Test Voltage	:	230Vac,50Hz	Temperature	:	22.5°C
Humidity	:	50%	Pressure	:	101.5kPa
Modulation Signal: 1kHz, 80% AM					
Frequency Range (MHz)	Injected Position	Voltage Level (r.m.s)	Performance		Result
			Required	Observation	(Pass/Fail)
0.15 - 10	AC mains	3V	A	A	Pass
10 - 30	AC mains	3V – 1V	A	A	Pass
30 - 80	AC mains	1V	A	A	Pass
Performance: There was no change compared with initial operation during the test.					

6.6 Voltage Dips and Voltage Interruptions

6.6.1 Specification Reference

EN 55035:2017, Clause 5, Table 4,4.2
 EN 61000-4-11:2004

6.6.2 Test Setup & Test Method



The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using a programmable power supply the equipment under test was subjected to the detailed supply voltage dips and interruptions. The required supply phase synchronization and test repetition rate, detailed, was controlled by the programmable power supply.

During this testing any anomalies in the equipment under tests performance was recorded.

6.6.3 Limits

Required Test Levels				
Test category	Test Level in % of rated U_t (%)	Duration(in period)		Performance Criteria
		50Hz	60Hz	
Voltage Dip	0% of V_{nom}	0.5		B
Voltage Dip	70% of V_{nom}	25	30	C
Voltage Interruptions	0% of V_{nom}	250	300	C

Supplementary information:
 Note 1. EUT powered at one of the Nominal input voltages and frequencies



6.6.4 Test Results

Results for Configuration and Mode: Full load.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

EUT	:	AC ADAPTER			Test Date	:	2021.01.27	
M/N	:	HJ-AD10-050210			Test Mode	:	Full Load	
Test Voltage	:	230Vac,50Hz/ 230Vac,60Hz			Temperature	:	22.6°C	
Humidity	:	57%			Pressure	:	101.5kPa	
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in period)		Phase Angle	Performance		Result (Pass /Fail)	
		50Hz	60Hz		Required	Observation		
0	100	0.5P		0°	B	A	Pass	
70	30	25P	30P	0°	C	B	Pass	
0	100	250P	300P	0°	C	B	Pass	
Performance: The EUT was Stopped during the test, but self-recoverable after the test.								

7. Photographs - Constructional Details

Photo 1 External photos of EUT

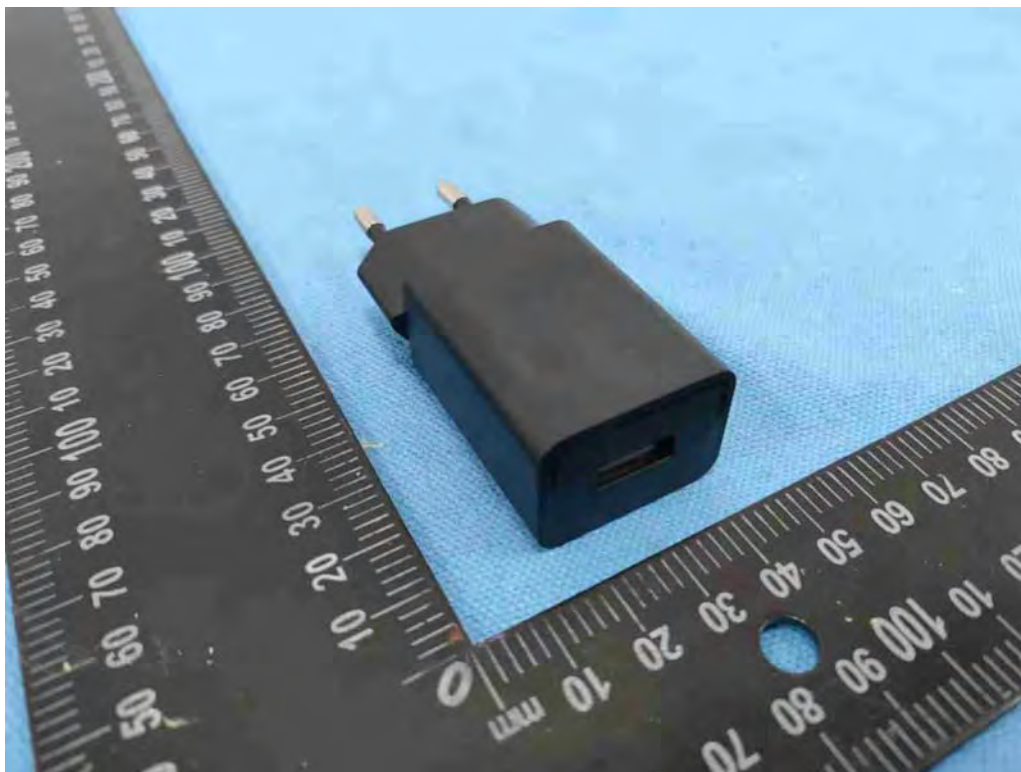
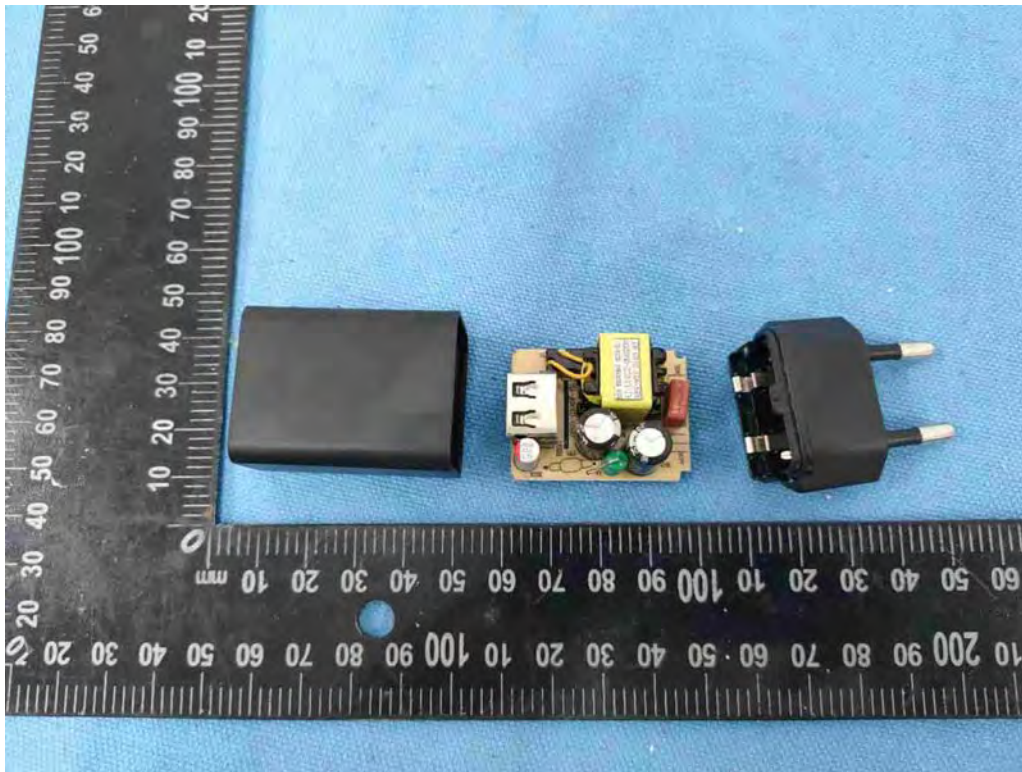


Photo 2 External photos of EUT



Photo 3 Internal photos of EUT



**Photo 4 Internal photos of EUT
with current fuse**

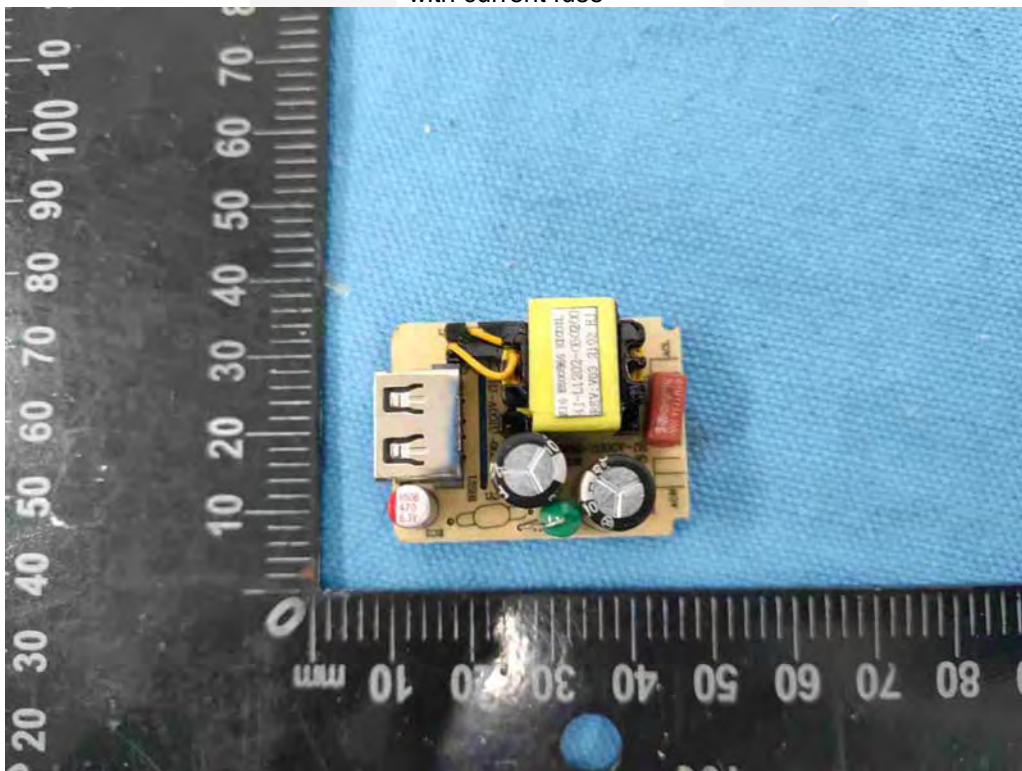


Photo 5 Internal photos of EUT
with fusible resistor

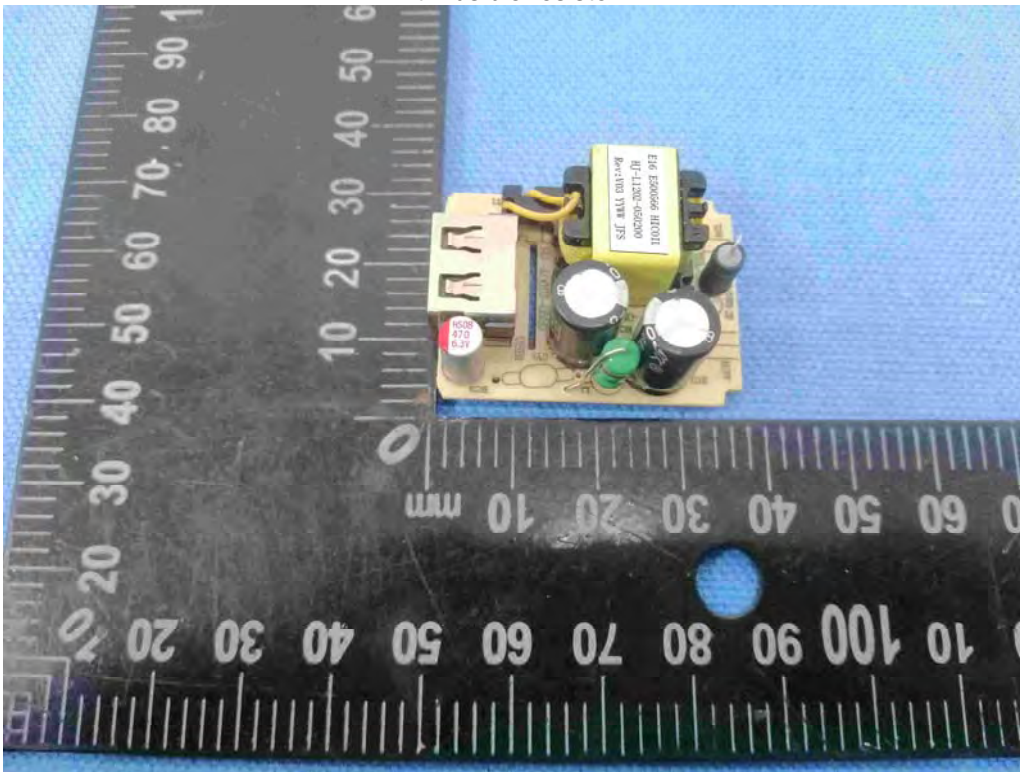
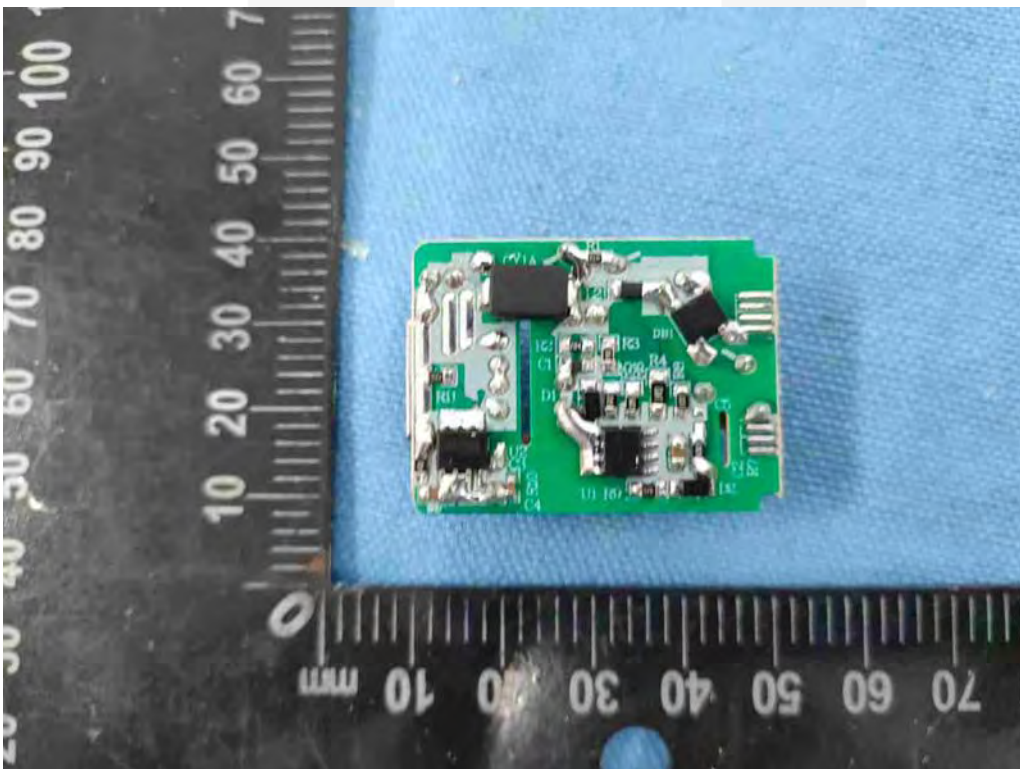


Photo 6 Internal photos of EUT



-----END OF REPORT-----