EN 55032:2015/A1:2020
EN 55035:2017/A11:2020
EN IEC 61000-3-2:2019/A1:2021
EN 61000-3-3:2013/A2:2021

TEST REPORT

For

QuarkPi-CA2

MODEL NUMBER: QuarkPi-CA2

REPORT NUMBER: E04A25020911E00101

ISSUE DATE: March 7, 2025

Prepared for

Guangzhou Xingyi Electronic Technology Co., Ltd
Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City

Prepared by

Guangdong Global Testing Technology Co., Ltd.

Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	March 7, 2025	Initial Issue	

Summary of Test Results

Emission			
Standard	**Test Item**	**Limit**	**Result**
EN 55032:2015/A1:2020	Conducted emissions (AC mains power ports)	Clause 5	Pass
	Conducted emissions (Asymmetric mode)	Clause 5	Pass
	Radiated emissions below 1GHz	Clause 5	Pass
	Radiated emissions above 1GHz	Clause 5	Pass
EN IEC 61000-3-2:2019/A1:2021	Harmonic current emissions	Clause 6	N/A (NOTE 1, 3)
EN 61000-3-3:2013/A2:2021	Voltage fluctuations and flicker	Clause 4	Pass

Immunity				
Basic Standard	**Test Item**	**Test Specification**	**Criteria**	**Result**
IEC 61000-4-2:2008	Electrostatic Discharge	Contact +/- 4 kV; Air +/- 2 kV;+/- 4 kV;+/- 8 kV	B	Pass
IEC 61000-4-3:2006 +A1:2007+A2:2010	Continuous RF electromagnetic field disturbances	3 V/m, 80 %; 1 kHz, AM 80 MHz-1000 MHz; 1800 MHz,2600 MHz,3500 MHz,5000 MHz	A	Pass
IEC 61000-4-4:2012	Electrical fast transients burst (AC mains power ports)	+/- 1.0 kV 5/50 ns, 5 kHz	B	Pass
	Electrical fast transients burst (analogue digital data ports)	+/-0.5 kV 5/50 ns, 5 kHz	B	Pass
IEC 61000-4-5:2014	Surges (AC mains power ports)	+/-2 kV (Common) +/-1 kV (Differential) 1.2/50 us	B	Pass
IEC 61000-4-6:2013	Continuous induced RF disturbances (AC mains power ports)	150 kHz-80 MHz 80 %, 1 kHz 0.15 MHz-10 MHz: 3 V 10 MHz-30 MHz: 3 V~1 V 30 MHz-80 MHz: 1 V	A	Pass
	Continuous induced RF disturbances (analogue digital data ports)	150 kHz-80 MHz 80 %, 1 kHz 0.15 MHz-10 MHz: 3 V 10 MHz-30 MHz: 3 V~1 V 30 MHz-80 MHz: 1 V	A	Pass
IEC 61000-4-8:2009	Power frequency magnetic field	50 Hz, 1 A/m	A	N/A (NOTE 1, 2)

IEC 61000-4-11:2004	Voltage dips and interruptions (AC mains power ports)	Residual < 5 %: 0.5 cycle; Residual 70 %: 25 cycles; Residual < 5 %: 250 cycles;	B,C,C	Pass

Note:
1. N/A: In this whole report not applicable.
2. Only applicable to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors.
3. If EUT rated power is less than 75 W, there is no need for Harmonics test to be performed.

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
*The measurement result for the sample received is <Pass> according to <EN 55032:2015/A1:2020, EN 55035:2017/A11:2020, EN IEC 61000-3-2:2019/A1:2021 , EN 61000-3-3:2013/A2:2021> when <Accuracy Method> decision rule is applied.

CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City

Manufacturer Information

Company Name:	Guangzhou Xingyi Electronic Technology Co., Ltd
Address:	Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City

Factory Information

Company Name:	Guangzhou P.E.T Precision Electronic Technology Co., Ltd
Address:	3rd Floor, No. 11 Shunjing Road, Daxiang Village, Renhe Town, Baiyun District, Guangzhou City (Airport Baiyun)

EUT Information

Product Description:	QuarkPi-CA2
Model:	QuarkPi-CA2
Brand:	ALIENTEK
Sample Received Date:	27 February 2025
Sample ID:	A25020911 001
Date of Tested:	February 28, 2025 to March 7, 2025

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
EN 55032:2015/A1:2020	**Pass**
EN 55035:2017/A11:2020	**Pass**
EN IEC 61000-3-2:2019/A1:2021	**Pass**
EN 61000-3-3:2013/A2:2021	**Pass**

Prepared By:

Jansen Lin

Project Engineer

Checked By:

Alan He

Laboratory Leader

Approved By:

Shawn Wen

Laboratory Manager

2. TEST METHODOLOGY

All tests were performed in accordance with the standard EN 55032:2015/A1:2020, EN 55035:2017/A11:2020, EN IEC 61000-3-2:2019/A1:2021 , EN 61000-3-3:2013/A2:2021

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 6947.01)** Guangdong Global Testing Technology Co., Ltd. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1343)** Guangdong Global Testing Technology Co., Ltd. has been recognized to perform compliance testing on equipment subject to Supplier's Declaration of Conformity (SDoC) and Certification rules **ISED (Company No.: 30714)** Guangdong Global Testing Technology Co., Ltd. has been registered and fully described in a report filed with ISED. The Company Number is 30714 and the test lab Conformity Assessment Body Identifier (CABID) is CN0148.

Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Conducted emissions (AC mains power ports)	0.009 MHz - 30 MHz	2	3.37
Conducted emissions (Asymmetric mode)	0.15 MHz - 30 MHz (ANN)	2	3.27
	0.15 MHz - 30 MHz(Current Probe)	2	2.73
Radiated emissions below 1GHz	30 MHz -1 GHz	2	3.79
Radiated emissions above 1GHz	1 GHz - 18 GHz	2	5.62
Note1: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.			
Note 2: According to the standard CISPR 16-4-2, the MU for the Conducted emissions from the AC mains power ports using AMN should not exceed 3.8 in range of 9kHz to 150kHz and 3.4 in range of 150kHz to 30MHz. We have considered the test results containing the value of Ulab (in dB) for the measurement instrumentation actually used for the measurements.			

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name		QuarkPi-CA2
Model		QuarkPi-CA2
EUT Classification		Class B
Internal Frequency		above 108MHz
Ratings		INPUT:DC12V 2.5A
Power Supply	DC	DC12V from adapter

5.2. TEST MODE

Test Mode	Description
M01	FULL LOAD

5.3. SUPPORT UNITS FOR SYSTEM TEST

The EUT has been tested as an independent unit

6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Conducted emissions (AC mains power ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Shielding Room 1	CHENG YU	8*5*4	N/A	10/29/2022	10/28/2025
LISN	R&S	ENV216	102843	9/13/2024	9/12/2025
EMI Test Receiver	R&S	ESR3	102647	9/14/2024	9/13/2025
LISN	Schwarzbeck	NNLK 8129 RC	5046	9/13/2024	9/12/2025
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	#237	9/14/2024	9/13/2025
CURRENT PROBE	R&S	EZ-17	101602	9/14/2024	9/13/2025
Test Software for CE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Conducted emissions (Asymmetric mode)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Shielding Room 1	CHENG YU	8*5*4	N/A	10/29/2022	10/28/2025
LISN	R&S	ENV216	102843	9/13/2024	9/12/2025
EMI Test Receiver	R&S	ESR3	102647	9/14/2024	9/13/2025
LISN	Schwarzbeck	NNLK 8129 RC	5046	9/13/2024	9/12/2025
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	#237	9/14/2024	9/13/2025
CURRENT PROBE	R&S	EZ-17	101602	9/14/2024	9/13/2025
Test Software for CE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Radiated emissions below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Chamber	ETS	9*6*6	Q2146	8/30/2022	8/29/2025
Receiver	R&S	ESCI3	101409	9/14/2024	9/13/2025
Loop Antenna	ETS	6502	243668	3/30/2022	3/30/2025
Pre-Amplifier	HzEMC	HPA-9K0130	HYPA21001	9/14/2024	9/13/2025
Biconilog Antenna	Schwarzbeck	VULB 9168	1315	10/10/2022	10/9/2025
Biconilog Antenna	ETS	3142E	243646	3/23/2022	3/22/2025
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Radiated emissions above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Spectrum Analyzer	R&S	FSV40	101413	9/14/2024	9/13/2025
Pre-Amplifier	HzEMC	HPA-1G1850	HYPA21003	9/14/2024	9/13/2025
Horn antenna	ETS	3117	246069	3/11/2022	3/10/2025
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
ESD Simulator	TESEQ	NSG437	336	9/14/2024	9/13/2025

Test Equipment of Continuous RF electromagnetic field disturbances					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Stacked Log-Per-Broadband Antenna	Schwarzbeck	STLP 9129	170	N/A	N/A
Power amplifier	MiCOTOP	MPA-80-1000-500	MPA2209336	9/13/2024	9/12/2025
Power amplifier	MiCOTOP	MPA-1000-6000-100	MPA2209337	9/13/2024	9/12/2025
EPM Series Power Meter	Keysight	N1914A	MY53240003	9/14/2024	9/13/2025
Average Power Sensor	Keysight	E9304A	MY41498925	9/14/2024	9/13/2025
Average Power Sensor	Keysight	E9304A	MY41497454	9/14/2024	9/13/2025
EXG Analog Signal Generator	Keysight	N5171B	MY61252624	9/14/2024	9/13/2025
Field Probe	Narda	EP 601	811ZX11137	9/14/2024	9/13/2025
Microphone kit	Magasig	MPA 663	220803075	9/14/2024	9/13/2025
Test Software for RS	HzEMC	FASLAB-RS	V2.7.2.3	N/A	N/A

Test Equipment of Electrical fast transients burst (AC mains power ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EFT Generator	Everfine	EMS61000-4B	G114921CA1341115	9/13/2024	9/12/2025

Test Equipment of Electrical fast transients burst (analogue digital data ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EFT Generator	Everfine	EMS61000-4B	G114921CA 1341115	9/13/2024	9/12/2025
Capacitive Coupling Clamp	Everfine	EFTC-2-V200	N/A	9/13/2024	9/12/2025

Test Equipment of Surges (AC mains power ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Immunity Teat System	EMC PARTNER	IMU3000 S-T	105684-2060	9/13/2024	9/12/2025
Signal line coupled decoupling network	EMC PARTNER	CDN-UTP8 ED3	1558	9/13/2024	9/12/2025

Test Equipment of Continuous induced RF disturbances (AC mains power ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EXG Analog Signal Generator	KEYSIGHT	N5171B	MY61252670	9/14/2024	9/13/2025
EPM Series Power Meter	KEYSIGHT	N1914A	MY50000188	9/14/2024	9/13/2025
Power Sensor	KEYSIGHT	E9304A	MY51180004	9/14/2024	9/13/2025
Power Sensor	KEYSIGHT	E9304A	MY51120019	9/14/2024	9/13/2025
Power Amplifier	AR	AR/100A 400M	305558	9/14/2024	9/13/2025
Double directional coupler	XIANGHUA	DDT0-1-40	221008732	9/13/2024	9/12/2025
COUPLING AND DECOUPLING NETWORK	Schwarzbeck	CDN M2/M3PE 16A	148	9/14/2024	9/13/2025
COUPLING AND DECOUPLING NETWORK	Schwarzbeck	CDN T8	53	9/14/2024	9/13/2025
Electromagnetic injection pliers	3ctest	EM CL100	EM C22060625	9/14/2024	9/13/2025
6 db attenuator	Huaxiang	WDTS	220831156	9/13/2024	9/12/2025
Microphone kit	Magasig	MPA 663	220803075	9/14/2024	9/13/2025
Signal conditioner	Magasig	PM 0083	5000718022 0009	9/14/2024	9/13/2025
Test Software for CS	HzEMC	FASLAB-CS	V2.7.2.1	N/A	N/A

Test Equipment of Continuous induced RF disturbances (analogue digital data ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EXG Analog Signal Generator	KEYSIGHT	N5171B	MY61252670	9/14/2024	9/13/2025
EPM Series Power Meter	KEYSIGHT	N1914A	MY50000188	9/14/2024	9/13/2025
Power Sensor	KEYSIGHT	E9304A	MY51180004	9/14/2024	9/13/2025
Power Sensor	KEYSIGHT	E9304A	MY51120019	9/14/2024	9/13/2025
Power Amplifier	AR	AR/100A 400M	305558	9/14/2024	9/13/2025
Double directional coupler	XIANGHUA	DDT0-1-40	221008732	9/13/2024	9/12/2025
COUPLING AND DECOUPLING NETWORK	Schwarzbeck	CDN M2/M3PE 16A	148	9/14/2024	9/13/2025
COUPLING AND DECOUPLING NETWORK	Schwarzbeck	CDN T8	53	9/14/2024	9/13/2025
Electromagnetic injection pliers	3ctest	EM CL100	EM C22060625	9/14/2024	9/13/2025
6 db attenuator	Huaxiang	WDTS	220831156	9/13/2024	9/12/2025
Microphone kit	Magasig	MPA 663	220803075	9/14/2024	9/13/2025
Signal conditioner	Magasig	PM 0083	5000718022 0009	9/14/2024	9/13/2025
Test Software for CS	HzEMC	FASLAB-CS	V2.7.2.1	N/A	N/A

Test Equipment of Voltage dips and interruptions (AC mains power ports)					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
DIP Generator	Everfine	EMS61000-11K	G113317CA 8341117	9/13/2024	9/12/2025

Test Equipment of Voltage fluctuations and flicker					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Harmonic and Fliker Analyzer	EMC PARTNER	Harmonics 1000-1P 230V	241	9/14/2024	9/13/2025
Test Software for H&F	EMC PARTNER AG	HARCS	V6.2	N/A	N/A

7. EMISSION TEST

7.1. CONDUCTED EMISSIONS (AC MAINS POWER PORTS)

LIMITS

(a.) Limits of conducted emissions from the AC mains power ports of Class A equipment

Frequency range MHz	Coupling device	Detector type / bandwidth	Class A voltage limits dB(uV)
0.15 to 0.5	AMN	Quasi Peak / 9 kHz	79
0.5 to 30			73
0.15 to 0.5	AMN	Average / 9 kHz	66
0.5 to 30			60

(b.) Limits of conducted emissions from the AC mains power ports of Class B equipment

Frequency range MHz	Coupling device	Detector type / bandwidth	Class B voltage limits dB(uV)
0.15 to 0.5	AMN	Quasi Peak / 9 kHz	66 to 56
0.5 to 5			56
5 to 30			60
0.15 to 0.5	AMN	Average / 9 kHz	56 to 46
0.5 to 5			46
5 to 30			50

(c.) Limits of asymmetric mode conducted emissions of Class A equipment

Frequency range MHz	Coupling device	Detector type / bandwidth	Class A voltage limits dB(uV)	Class A current limits dB(uA)
0.15 -0.5	AAN	Quasi Peak / 9 kHz	97 to 87	n/a
0.5 -30			87	n/a
0.15 -0.5	AAN	Average / 9 kHz	84 to 74	n/a
0.5 -30			74	n/a
0.15 -0.5	Current Probe	Quasi Peak / 9 kHz	N/A	53 to 43
0.5 -30			N/A	43
0.15 -0.5	Current Probe	Average / 9 kHz	N/A	40 to 30
0.5 -30			N/A	30

(d.) Limits of asymmetric mode conducted emissions of Class B equipment

Frequency range MHz	Coupling device	Detector type / bandwidth	Class B voltage limits dB(uV)	Class B current limits dB(uA)
0.15 -0.5	AAN	Quasi Peak / 9 kHz	84 to 74	n/a
0.5 -30			74	n/a
0.15 -0.5	AAN	Average / 9 kHz	74 to 64	n/a
0.5 -30			64	n/a
0.15 -0.5	Current Probe	Quasi Peak / 9 kHz	n/a	40 to 30
0.5 -30			n/a	30
0.15 -0.5	Current Probe	Average / 9 kHz	n/a	30 to 20
0.5 -30			n/a	20

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the horizontal ground plane and being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

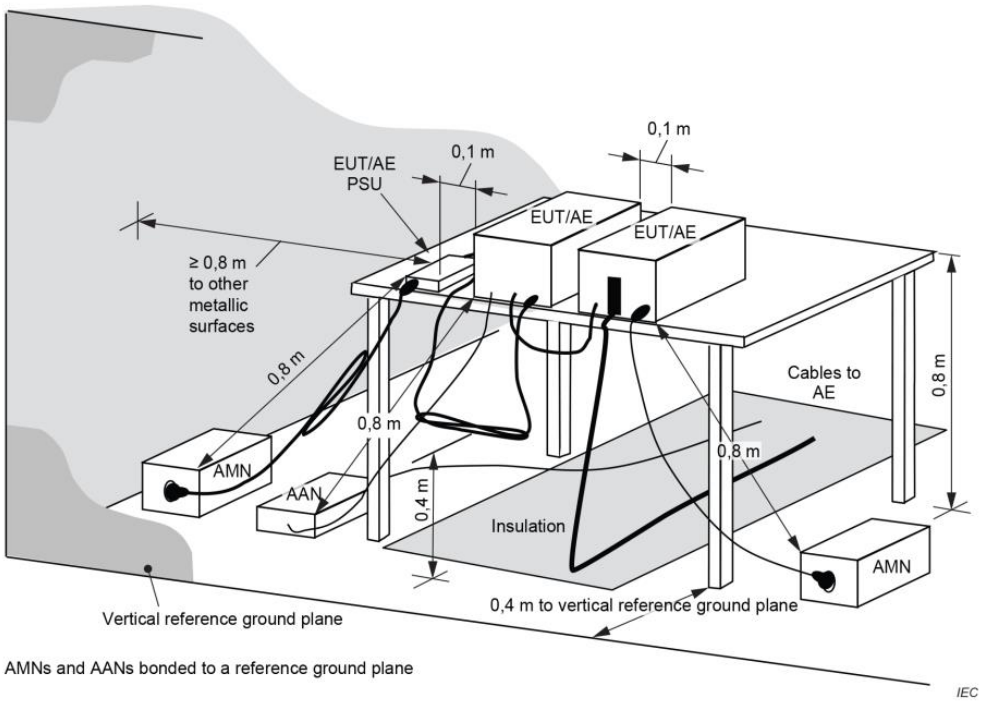
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

d. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

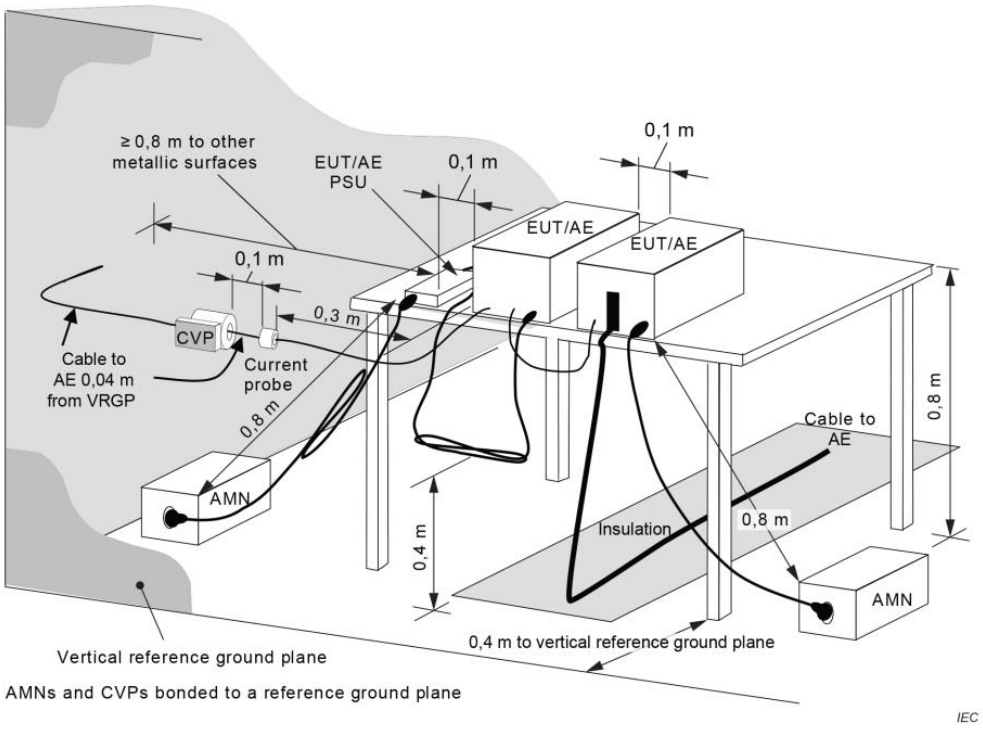
e. LISN at least 80 cm from nearest part of EUT chassis.

f. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

TEST SETUP



AMNs and AANs bonded to a reference ground plane



AMNs and CVPs bonded to a reference ground plane

TEST ENVIRONMENT

Temperature	23.4℃	Relative Humidity	54%
Atmosphere Pressure	101kPa		

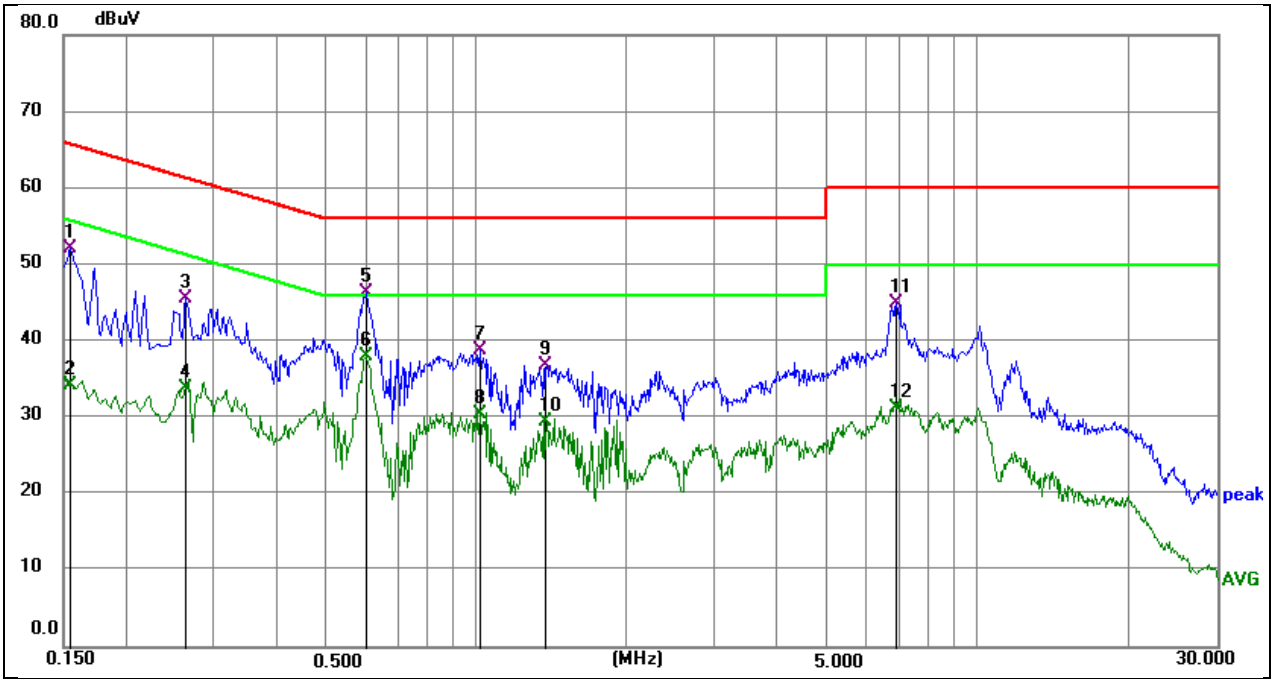
TEST MODE

Pre-test Mode:	M01 ~ M01

Final Test Mode:	M01

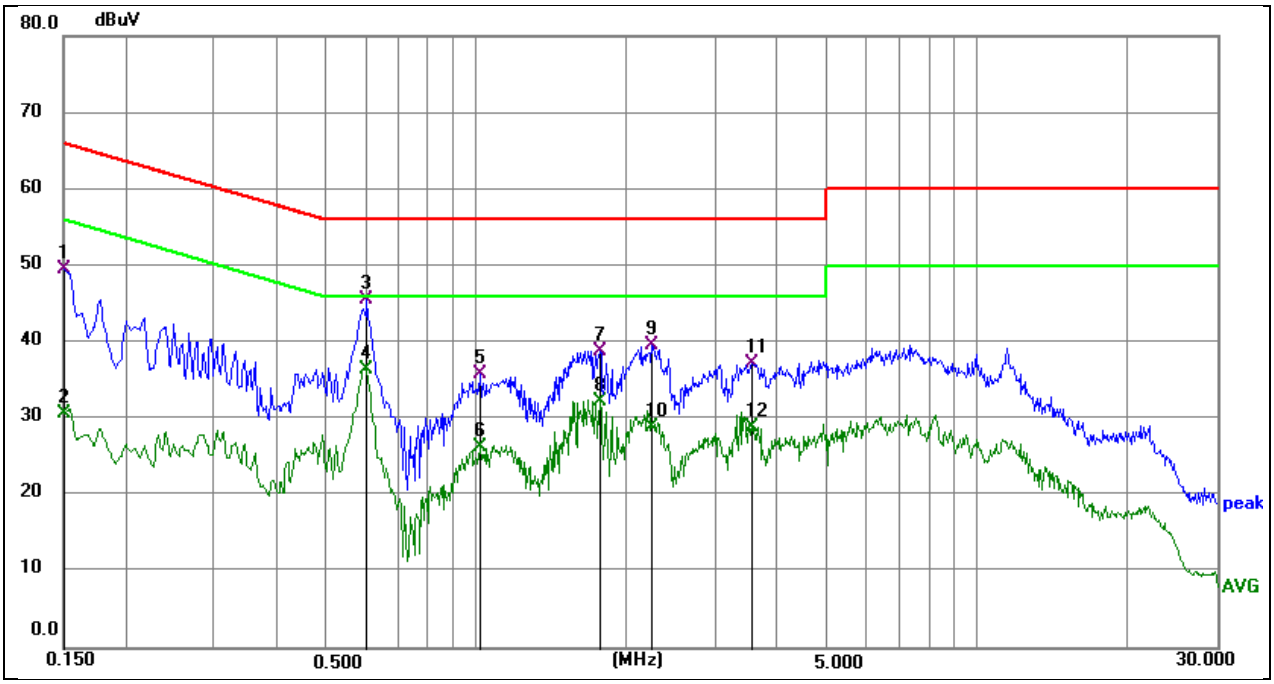
Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS



Phase: N	Mode: M01

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1545	42.23	9.90	52.13	65.75	-13.62	QP
2	0.1545	24.33	9.90	34.23	55.75	-21.52	AVG
3	0.2625	35.76	9.79	45.55	61.35	-15.80	QP
4	0.2625	23.97	9.79	33.76	51.35	-17.59	AVG
5	0.6045	36.67	9.77	46.44	56.00	-9.56	QP
6	0.6045	28.17	9.77	37.94	46.00	-8.06	AVG
7	1.0184	28.87	9.84	38.71	56.00	-17.29	QP
8	1.0184	20.61	9.84	30.45	46.00	-15.55	AVG
9	1.3829	26.99	9.80	36.79	56.00	-19.21	QP
10	1.3829	19.71	9.80	29.51	46.00	-16.49	AVG
11	6.9045	35.06	9.97	45.03	60.00	-14.97	QP
12	6.9045	21.29	9.97	31.26	50.00	-18.74	AVG



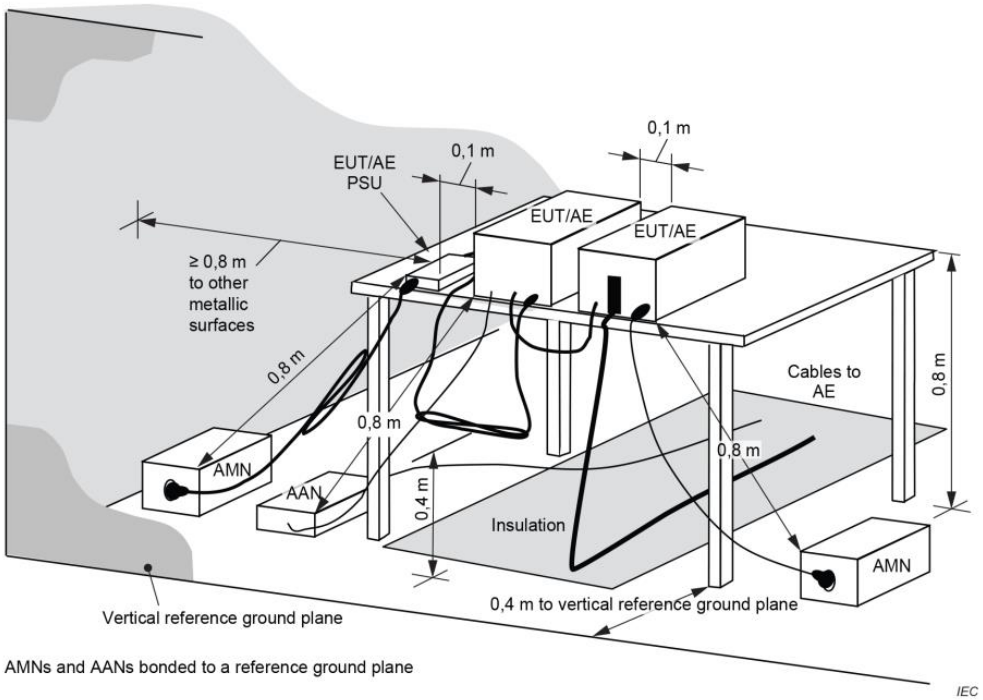
Phase: L1	Mode: M01

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	39.88	9.71	49.59	66.00	-16.41	QP
2	0.1500	20.96	9.71	30.67	56.00	-25.33	AVG
3	0.6045	35.69	9.82	45.51	56.00	-10.49	QP
4	0.6045	26.59	9.82	36.41	46.00	-9.59	AVG
5	1.0184	26.10	9.74	35.84	56.00	-20.16	QP
6	1.0184	16.49	9.74	26.23	46.00	-19.77	AVG
7	1.7655	28.92	9.89	38.81	56.00	-17.19	QP
8	1.7655	22.39	9.89	32.28	46.00	-13.72	AVG
9	2.2425	29.63	9.93	39.56	56.00	-16.44	QP
10	2.2425	18.95	9.93	28.88	46.00	-17.12	AVG
11	3.5520	27.29	9.87	37.16	56.00	-18.84	QP
12	3.5520	18.95	9.87	28.82	46.00	-17.18	AVG

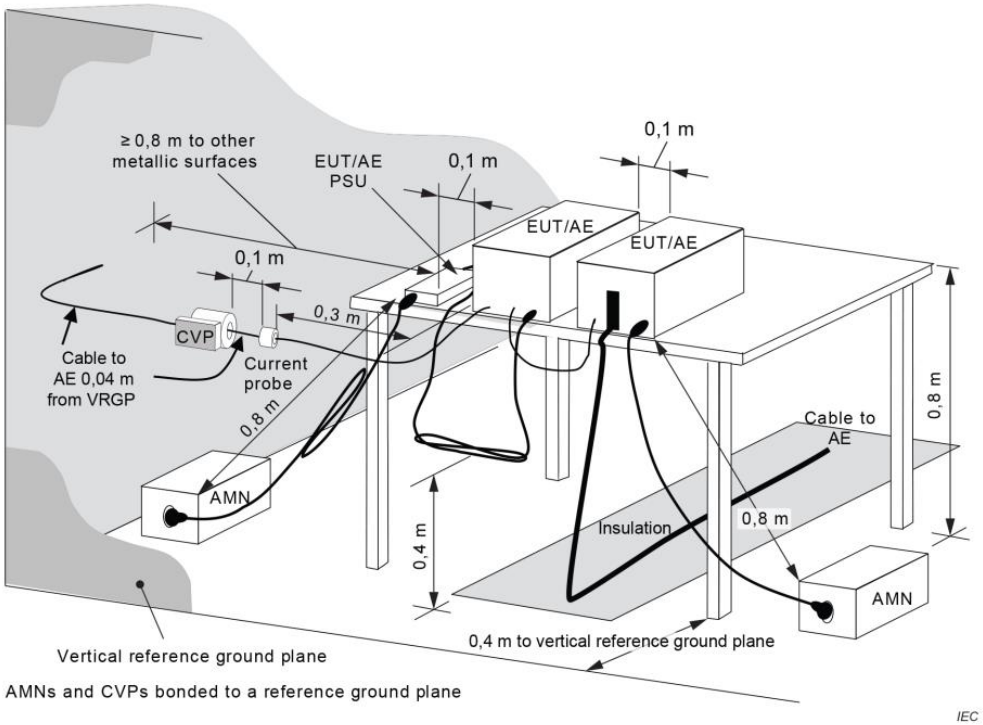
Remark: Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
Margin = Result - Limit

7.2. CONDUCTED EMISSIONS (ASYMMETRIC MODE)

TEST SETUP



AMNs and AANs bonded to a reference ground plane



AMNs and CVPs bonded to a reference ground plane

TEST ENVIRONMENT

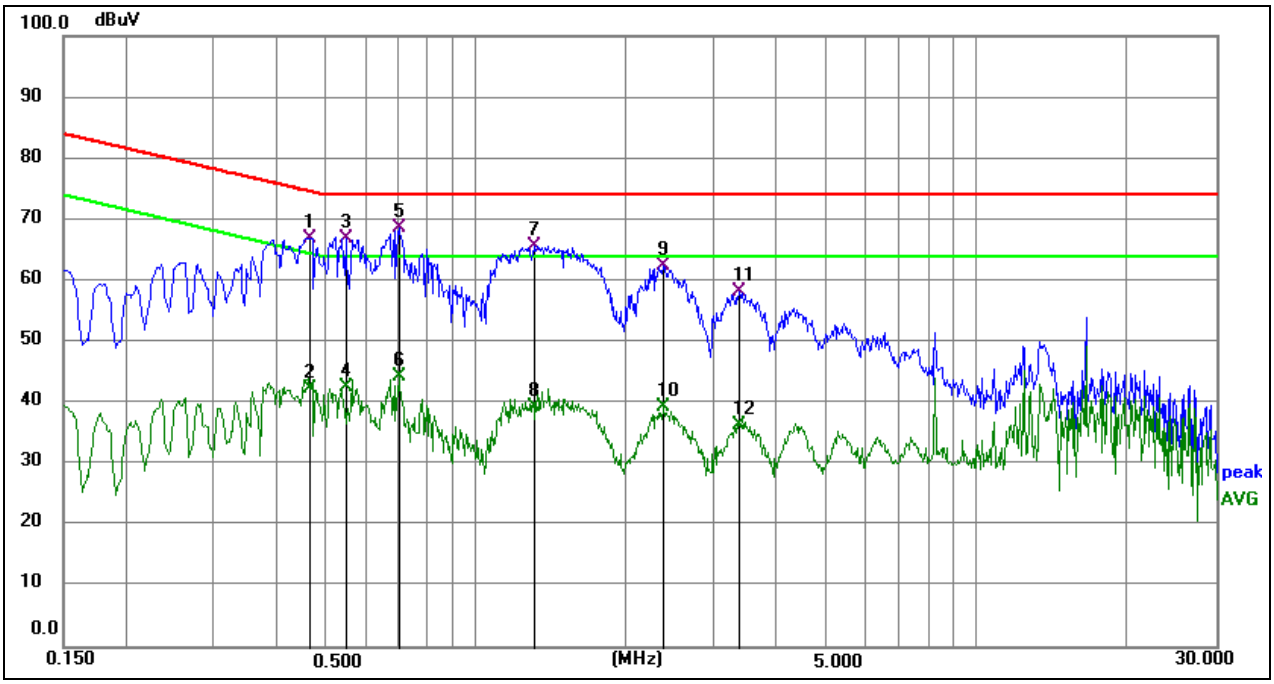
Temperature	20.1℃	Relative Humidity	50%
Atmosphere Pressure	101kPa		

TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS



Phase: Asymmetric mode	Mode: M01

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.4650	57.17	9.69	66.86	74.60	-7.74	QP
2	0.4650	32.55	9.69	42.24	64.60	-22.36	AVG
3	0.5504	57.33	9.66	66.99	74.00	-7.01	QP
4	0.5504	32.82	9.66	42.48	64.00	-21.52	AVG
5	0.7035	58.90	9.61	68.51	74.00	-5.49	QP
6	0.7035	34.56	9.61	44.17	64.00	-19.83	AVG
7	1.3064	55.98	9.74	65.72	74.00	-8.28	QP
8	1.3064	29.59	9.74	39.33	64.00	-24.67	AVG
9	2.3774	52.42	9.89	62.31	74.00	-11.69	QP
10	2.3774	29.37	9.89	39.26	64.00	-24.74	AVG
11	3.3540	48.23	9.91	58.14	74.00	-15.86	QP
12	3.3540	26.42	9.91	36.33	64.00	-27.67	AVG

7.3. RADIATED EMISSIONS BELOW 1GHZ

LIMITS

(a). **Limits up to 1 GHz**

FREQUENCY (MHz)	Class A		Class B	
	At 10 m	At 3 m	At 10 m	At 3 m
	dBμV/m	dBμV/m	dBμV/m	dBμV/m
30 – 230	40	50	30	40
230 – 1000	47	57	37	47

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBμV/m)=20log Emission level (uV/m).

(3) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

TEST PROCEDURE

Below 1 GHz and above 30 MHz

The setting of the spectrum analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak and QP
Trace	Max hold

1. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp was used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

2. The EUT was placed on a turntable with 80 cm above ground.

3. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

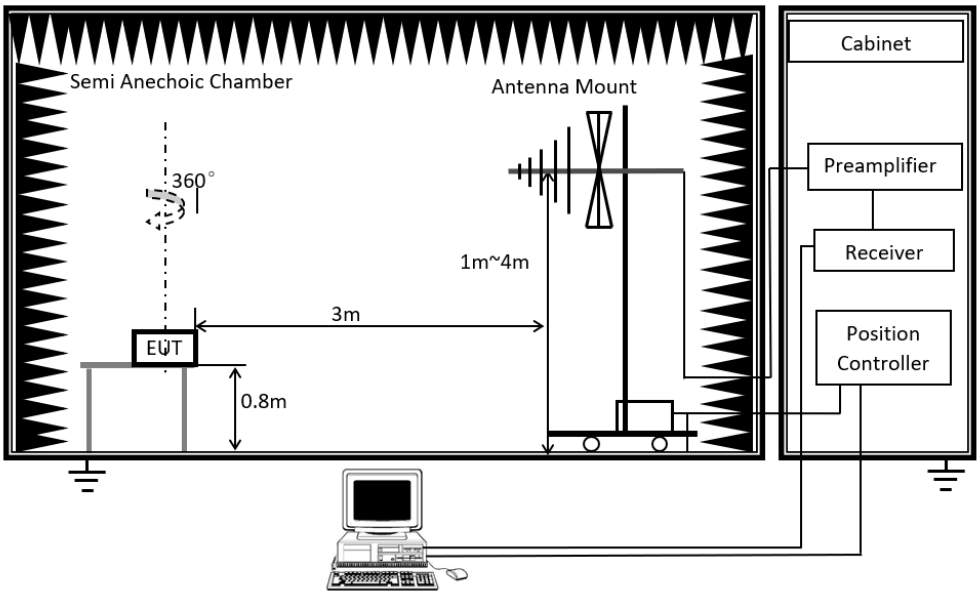
4. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

5. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.

6. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

7. For measurement below 1 GHz, the initial step in collecting Radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

TEST SETUP



TEST ENVIRONMENT

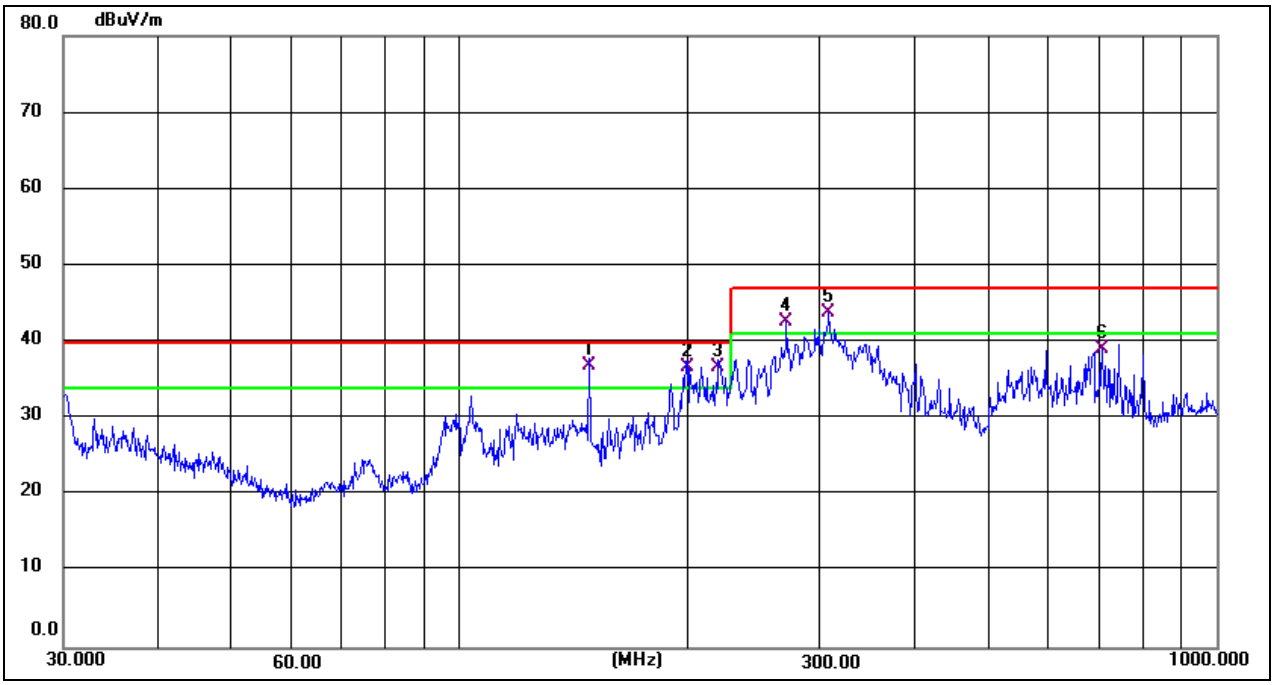
Temperature	23℃	Relative Humidity	47%
Atmosphere Pressure	101kPa		

TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

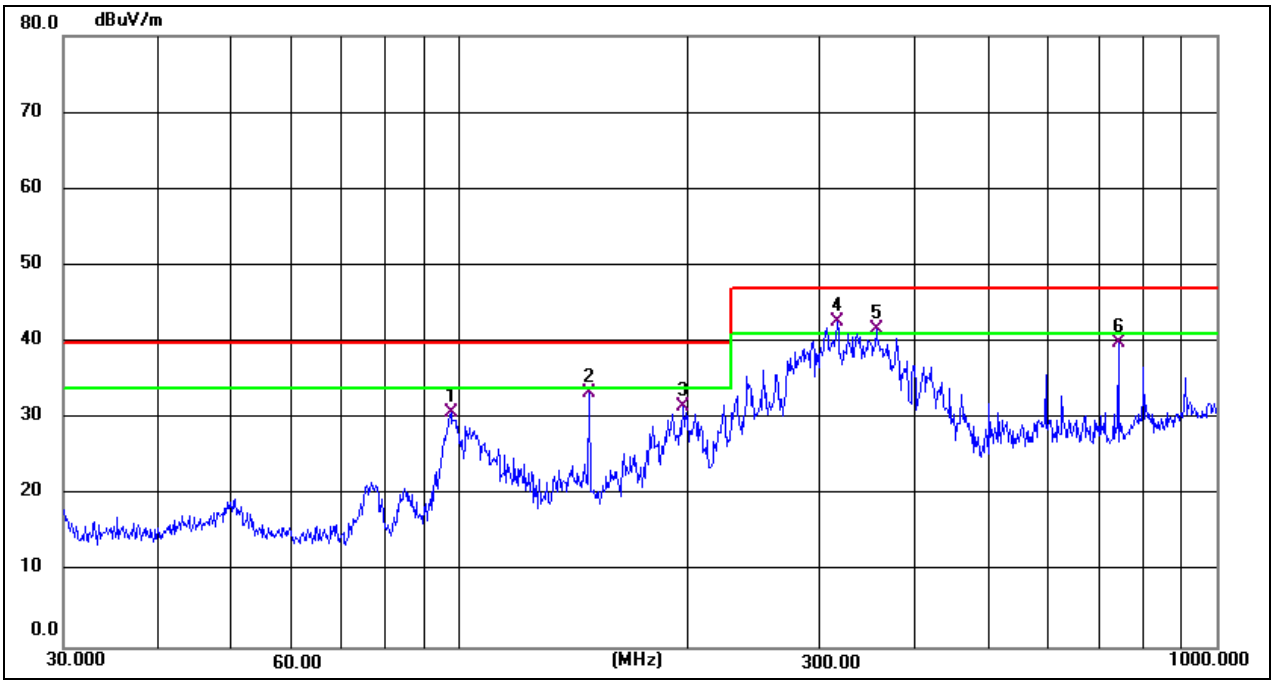
Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS



Antenna::Vertical	Mode: M01

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measure-ment(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
1 *	148.4410	48.56	-11.59	36.97	40.00	-3.03	QP	
2 !	199.9856	52.33	-15.50	36.83	40.00	-3.17	QP	
3 !	219.8449	51.68	-14.95	36.73	40.00	-3.27	QP	
4 !	270.3748	56.15	-13.49	42.66	47.00	-4.34	QP	
5 !	307.8313	56.25	-12.40	43.85	47.00	-3.15	QP	
6	706.6999	42.38	-3.27	39.11	47.00	-7.89	QP	



Antenna::Horizontal	Mode: M01

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measure-ment(dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
1	97.4560	46.59	-15.78	30.81	40.00	-9.19	QP	
2	148.4410	45.02	-11.59	33.43	40.00	-6.57	QP	
3	197.8928	46.95	-15.36	31.59	40.00	-8.41	QP	
4 *	315.4808	54.94	-12.18	42.76	47.00	-4.24	QP	
5 !	355.4273	52.73	-11.07	41.66	47.00	-5.34	QP	
6	742.2587	42.44	-2.58	39.86	47.00	-7.14	QP	

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

7.4. RADIATED EMISSIONS ABOVE 1GHZ

LIMITS

(a). **Limits above 1 GHz**

FREQUENCY (MHz)	Class A (at 3 m) dBμV/m		Class B (at 3 m) dBμV/m	
	Peak	Avg	Peak	Avg
1000-6000	80	60	74	54

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBμV/m)=20log Emission level (uV/m).

(3) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

TEST PROCEDURE

Above 1 GHz

The setting of the spectrum analyzer

RBW	1 MHz
VBW	3 MHz
Sweep	Auto
Detector	Peak: Peak AVG: RMS
Trace	Max hold

a. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

b. The EUT was placed on a turntable with 80 cm above ground.

c. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

d. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

e. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal

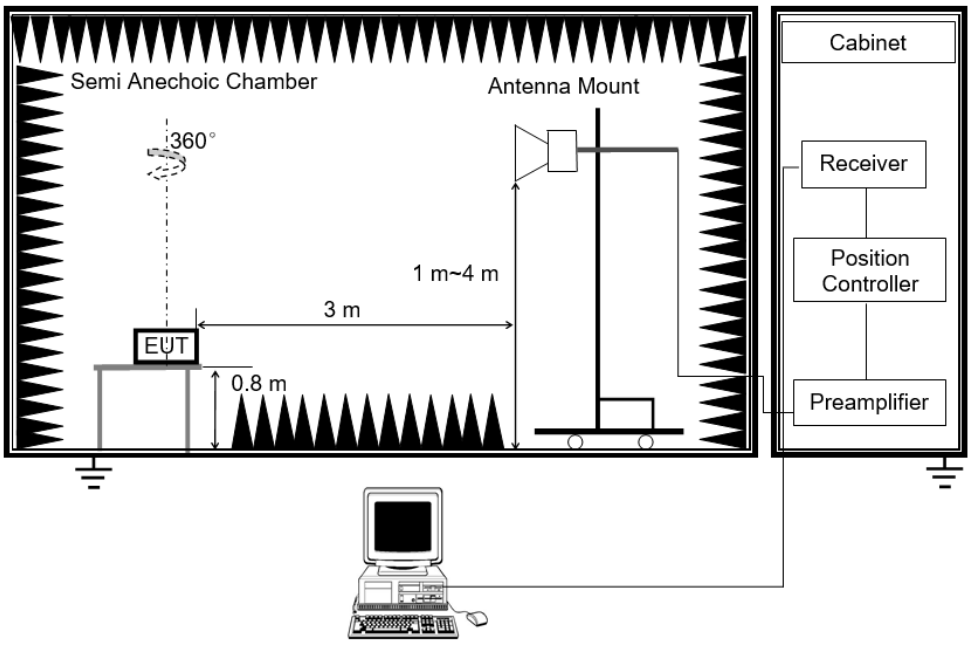
used.

f. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

g. For measurement above 1 GHz, the peak emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the peak limit. If peak result complies with average limit, average result is deemed to comply with average limit.

h. The average emission measurement will be measured by the RMS detector and must comply with the average limit.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.1℃	Relative Humidity	51%
Atmosphere Pressure	101kPa		

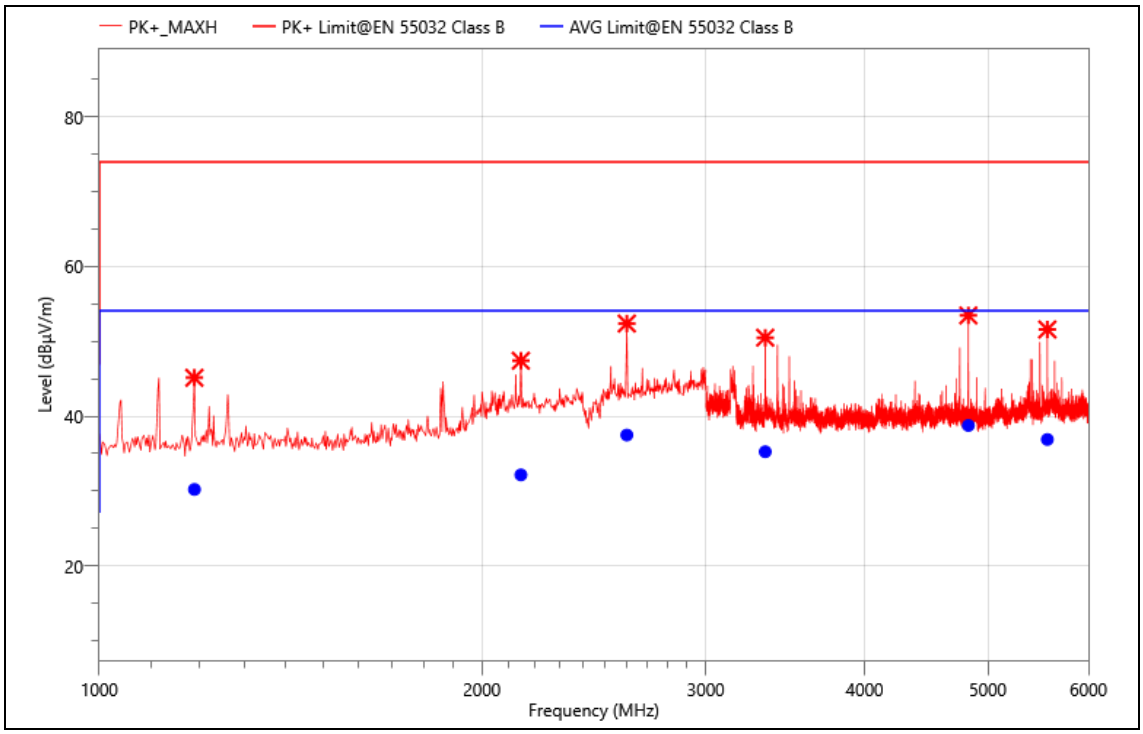
TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

Mode:	Full Load
Power:	AC 230V/50Hz for DC12V
TE:	Fink
Date	2025/03/01
T/A/P	22.1℃/51%/101Kpa



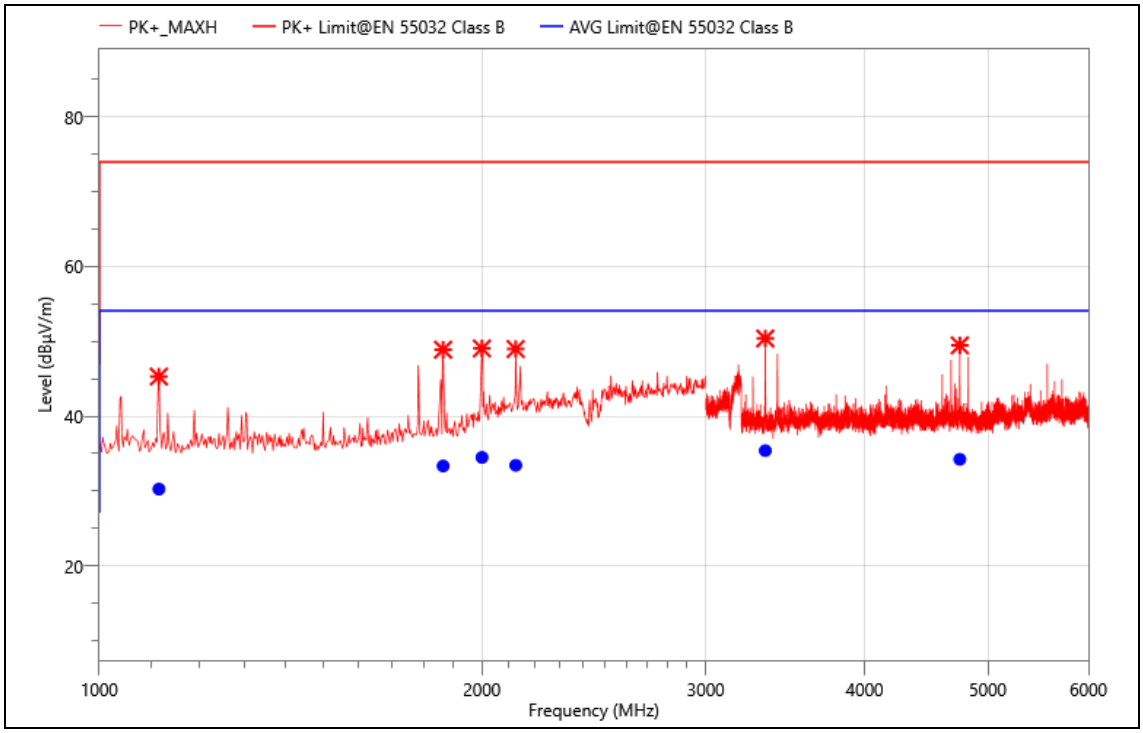
Critical_Freqs

No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.
1	1188.000	59.82	-	45.14	74.00	28.86	PK+	V
2	2146.000	56.47	-9.05	47.42	74.00	26.58	PK+	V
3	2600.000	60.53	-8.15	52.38	74.00	21.62	PK+	V
4	3340.800	64.96	-	50.49	74.00	23.51	PK+	V
5	4826.400	64.96	-	53.47	74.00	20.53	PK+	V
6	5568.900	60.89	-9.3	51.59	74.00	22.41	PK+	V

Final_Result

No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.	Verdict
1	1188.000	44.91	-	30.23	54.00	23.77	AVG	V	PASS
2	2146.000	41.22	-9.05	32.17	54.00	21.83	AVG	V	PASS
3	2600.000	45.64	-8.15	37.49	54.00	16.51	AVG	V	PASS
4	3340.800	49.73	-	35.26	54.00	18.74	AVG	V	PASS
5	4826.400	50.26	-	38.77	54.00	15.23	AVG	V	PASS
6	5568.900	46.20	-9.3	36.90	54.00	17.10	AVG	V	PASS

Mode:	Full Load
Power:	AC 230V/50Hz for DC12V
TE:	Fink
Date	2025/03/01
T/A/P	22.1℃/51%/101Kpa



Critical_Freqs

No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.
1	1114.000	60.34	-15.04	45.30	74.00	28.70	PK+	H
2	1864.000	59.29	-10.4	48.89	74.00	25.11	PK+	H
3	2000.000	58.15	-9.1	49.05	74.00	24.95	PK+	H
4	2126.000	58.05	-9.07	48.98	74.00	25.02	PK+	H
5	3341.100	64.85	-14.47	50.38	74.00	23.62	PK+	H
6	4752.300	60.90	-11.43	49.47	74.00	24.53	PK+	H

Final_Result

No.	Freq. (MHz)	Reading (dBµV)	Corr. (dB)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Det.	Pol.	Verdict
1	1114.000	45.31	-15.04	30.27	54.00	23.73	AVG	H	PASS
2	1864.000	43.76	-10.4	33.36	54.00	20.64	AVG	H	PASS
3	2000.000	43.60	-9.1	34.50	54.00	19.50	AVG	H	PASS
4	2126.000	42.52	-9.07	33.45	54.00	20.55	AVG	H	PASS
5	3341.100	49.88	-14.47	35.41	54.00	18.59	AVG	H	PASS
6	4752.300	45.68	-11.43	34.25	54.00	19.75	AVG	H	PASS

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
2. Margin = Result - Limit

7.5. VOLTAGE FLUCTUATIONS AND FLICKER

LIMITS

Test items	Limits (EN 61000-3-3)	Descriptions
P_{st}	≤1.0, T_p=10 min	short-term flicker indicator
P_{lt}	≤0.65, T_p=2 h	long-term flicker indicator
d_c	≤3.3 %	relative steady-state voltage change
d_{max}	≤4 %(or 6 %Note(1), 7 % Note(2))	maximum relative voltage change:
$d_{(t)}$	≤3.3 %, more than 500 ms	relative voltage change characteristic

Note:

(1)6 % for equipment which is:

a. switched manually, or

b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

(2)7 % for equipment which is

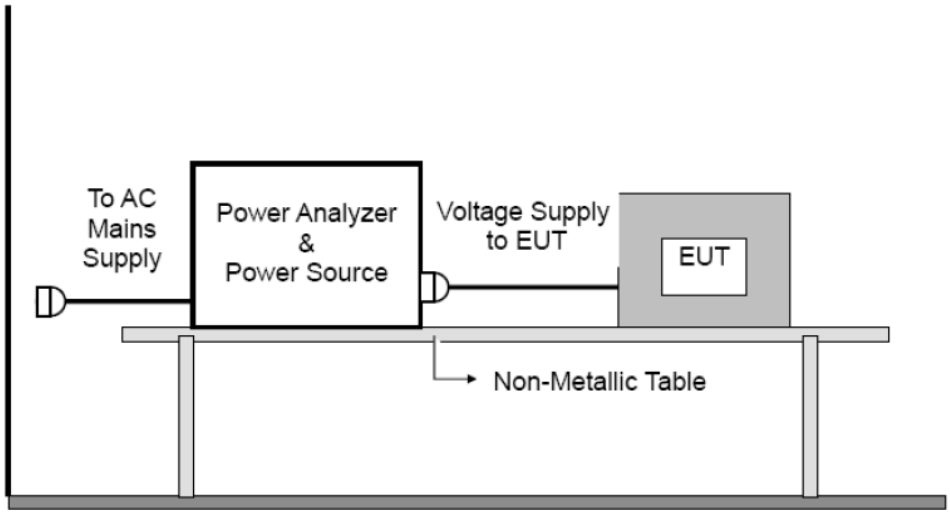
a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or

b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal Condition
b. During the flick measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.
c. Tests was performed according to the Test Condition/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
d. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.2℃	Relative Humidity	49%
Atmosphere Pressure	101kPa		

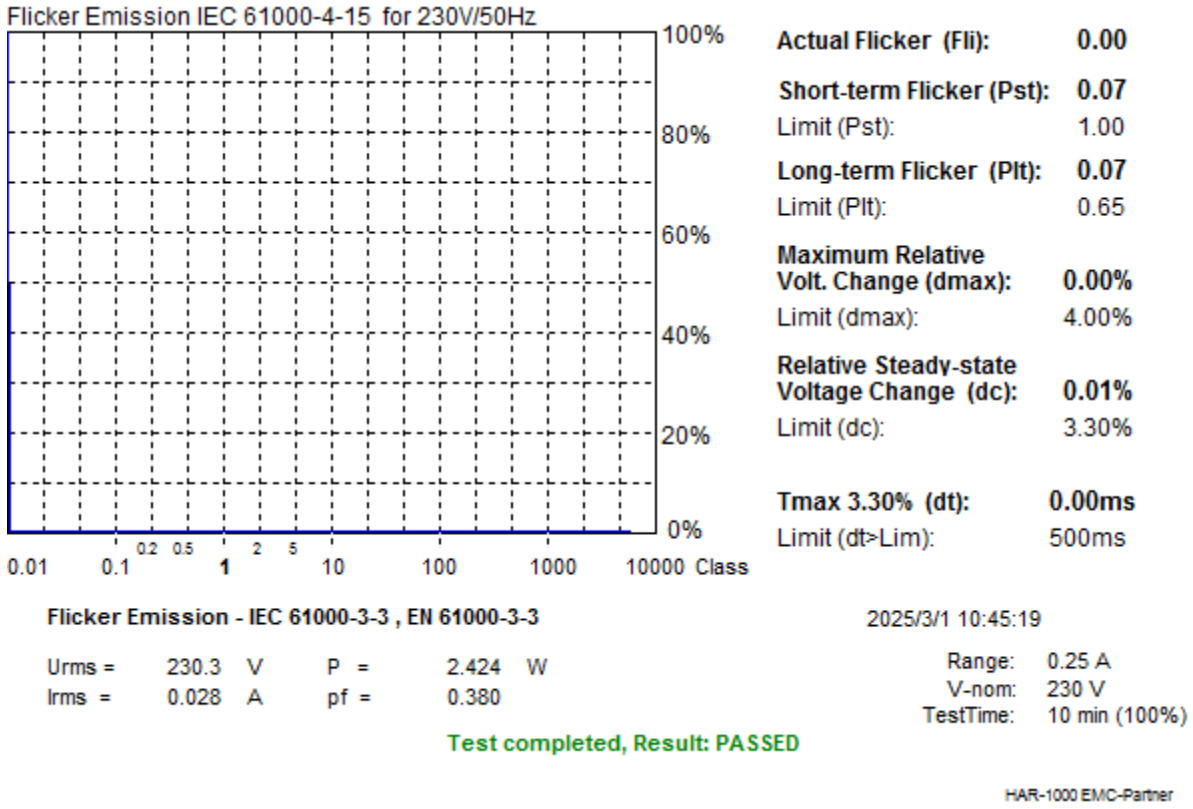
TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

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




```
Urms =  230.3V  Freq =  50.013  Range:  0.25 A
Irms =  0.028A  Ipk  =  0.151A  cf    =  5.441
P    =  2.424W  S    =  6.382VA pf    =  0.380

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

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

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

Test completed, Result: PASSED
```

8. IMMUNITY TEST

8.1. PERFORMANCE CRITERIA

EN 55035:2017/A11:2020

GENERAL PERFORMANCE CRITERIA

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

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

PERFORMANCE CRITERIA FOR BROADCAST RECEPTION FUNCTION

The broadcast reception function shall comply with the general performance criteria given in Clause 8 and any relevant annex with the deviations defined in Table A.2.

Table A.2 – Modified test levels for performance criterion A for the broadcast reception function

Performance criteria	Test type table clause	Group 1	Group 2
Criterion A	1.2 1.3	The disturbance level is reduced to 1 V/m for in-band frequencies.	No test requirements apply
	2.1 3.1 4.1	The disturbance level is reduced to 1 V for in-band frequencies.	

In-band is defined as the entire tuneable operating range of the selected broadcast reception function.
The tuned channel ±0,5 MHz (lower edge frequency – 0,5 MHz up to the upper edge frequency + 0,5 MHz of the tuned channel) is excluded from testing.
Note: In some countries, there is a requirement to test the tuned channels. Refer to the relevant regional requirements for guidance.

PERFORMANCE CRITERIA FOR PRINT FUNCTION

Criterion A	Refer to chapter B.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter B.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter B.3.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR SCAN FUNCTION

Criterion A	Refer to chapter C.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter C.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter C.3.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR DISPLAY AND DISPLAY OUTPUT FUNCTION

Criterion A	Refer to chapter D.3.1 and D.3.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter D.3.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter D.3.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR MUSICAL TONE GENERATING FUNCTION

Criterion A	Refer to chapter E.3.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter E.3.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter E.3.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR NETWORKING FUNCTION

General requirements for network functions	
Criterion A	Refer to chapter F.3.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter F.3.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter F.3.3.3 of EN 55035:2017/A11:2020

Requirements for CPE containing xDSL ports	
Criterion A	Refer to chapter F.4.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter F.4.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter F.4.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR AUDIO OUTPUT FUNCTION

Criterion A	Refer to chapter G.7.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter G.7.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter G.7.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR TELEPHONY FUNCTION

Criterion A	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020

8.2. ELECTROSTATIC DISCHARGE

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-2:2008
Criterion Required:	Performance criteria B
Discharge Impedance:	330(1±10 %) Ω / 150(1±10 %) pF
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Test Level:	Air Discharge: 2 kV, 4 kV, 8 kV (Direct); Contact Discharge: 4 kV (Direct/Indirect)

TEST PROCEDURE

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

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5 m x 0.5 m, is placed parallel to, and positioned at a distance 0.1 m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1 m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

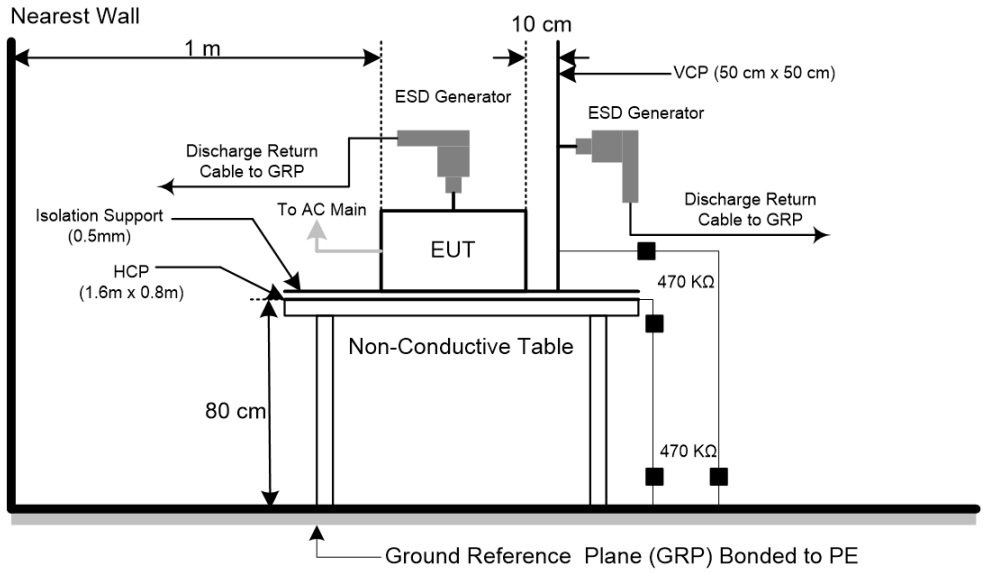
b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

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

d. For air discharge testing, the test shall be applied at all test levels 2 kV, 4 kV and 8 kV.

e. For the actual test configuration, please refer to the related Item: EUT Test Photos.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.2℃	Relative Humidity	49%
Atmosphere Pressure	101kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Mode	Level(kV)	Polarity	Test Point	Criteria	Result	Judgement
Air Discharge	2,4,8	+	All Slot	B	A	Pass
Air Discharge	2,4,8	-	All Slot	B	A	Pass
Contact Discharge	4	+	All Metal	B	A	Pass
Contact Discharge	4	-	All Metal	B	A	Pass
Horizontal Coupling	4	+	Front,rear,left,right	B	A	Pass
Horizontal Coupling	4	-	Front,rear,left,right	B	A	Pass
Vertical Coupling	4	+	Front,rear,left,right	B	A	Pass
Vertical Coupling	4	-	Front,rear,left,right	B	A	Pass
Air Discharge	15	+	All Slot	/	/	/
Air Discharge	15	-	All Slot	/	/	/
Contact Discharge	8	+	All Metal	/	/	/
Contact Discharge	8	-	All Metal	/	/	/

Observation:
A: No observable change.
Conclusion: The EUT met the requirements of the standard

8.3. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-3:2006 +A1:2007+A2:2010
Criterion Required:	Performance criteria A
Frequency range:	80 MHz - 1000MHz; 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz
Test Level:	Level 2: 3 V/m (measured unmodulated)
Modulation:	The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz.
Frequency Step:	1 % of fundamental
Dwell time:	1 seconds
Antenna Polarization:	Horizontal and vertical

TEST PROCEDURE

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

a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

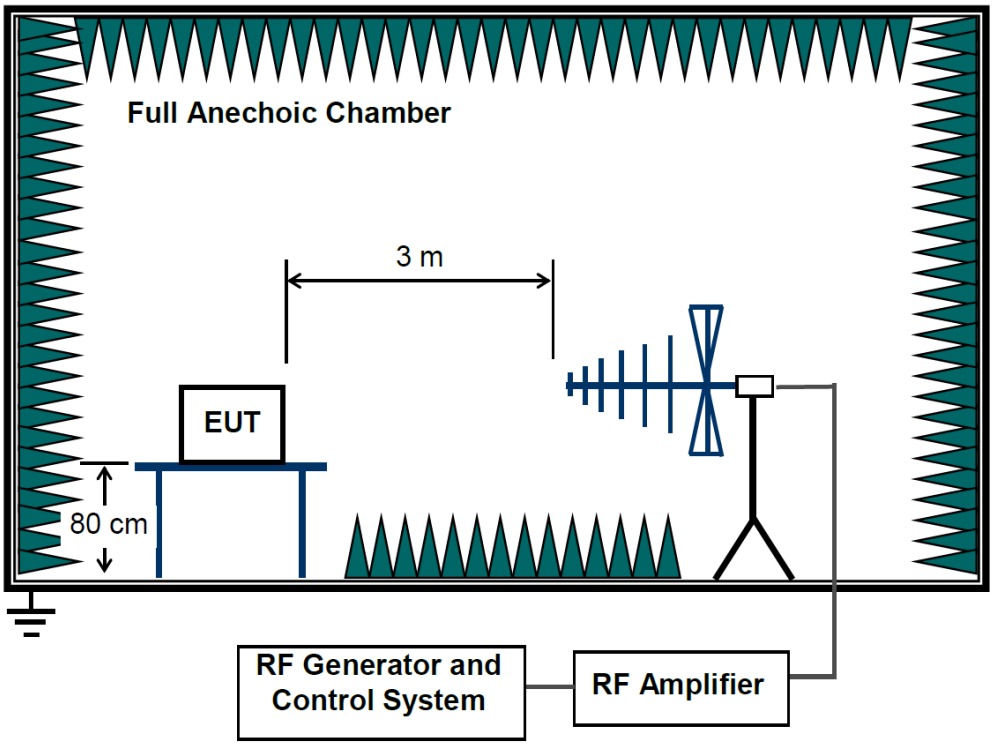
b. The disturbance test signal shall be 80 % amplitude modulated by a sine wave, preferably having a frequency of 1 kHz. A frequency other than 1 kHz may be used where permitted within EN 55035 (for example Clause G.3).

c. 1 % step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4 % of the previous frequency with a test level of twice the value of the specified test level.

d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time should not exceed 5 s at each of the frequencies during the scan.

e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.4℃	Relative Humidity	53%
Atmosphere Pressure	101kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Freq.Range (MHz)	Position (Face)	Polarity (H or V)	Field Strength (V/m) (unmodulated,r.m.s)	Criterion	Result	Judgment
80-1000; 1800; 2600; 3500; 5000;	0°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	90°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	180°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	270°	H&V	3 V/m	A	A	Pass
Observation: A: No observable change. **Conclusion:** The EUT met the requirements of the standard						

8.4. ELECTRICAL FAST TRANSIENTS BURST

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-4:2012
Criterion Required:	Performance criteria B
Polarity:	Positive & Negative
Test Level and Repetition Frequency:	The test level for shall be 0.5kV,1 kV open circuit voltage at a repetition rate of 5 kHz as given EN 61000-4-4.
Impulse Wave shape:	5/50 Tr/Th ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 Minute

TEST PROCEDURE

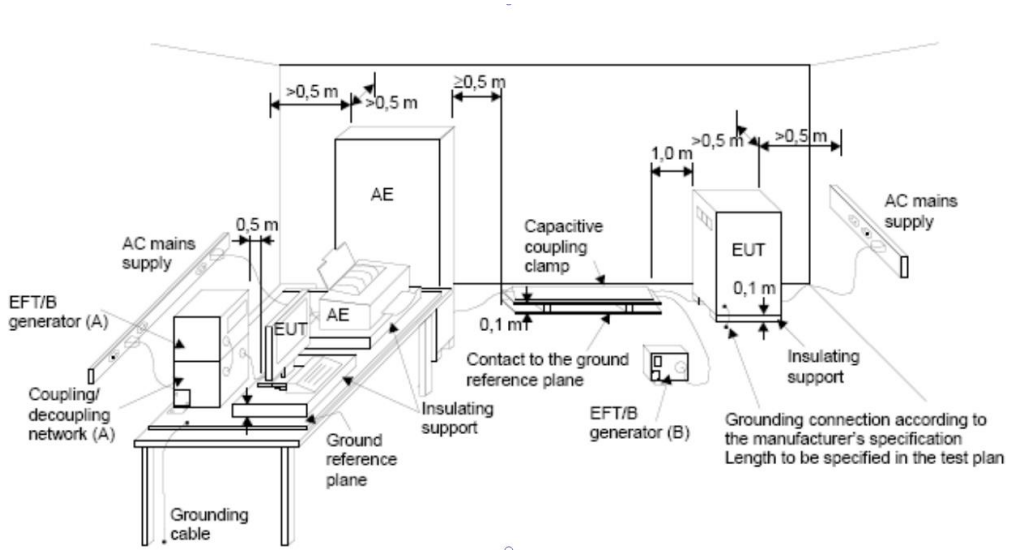
a. Both positive and negative polarity discharges were applied.

b. The duration time of each test sequential was 1 minute.

c. The transient/burst waveform was in accordance with IEC 61000-4-4, 5/50ns.

d. Multi conductor cables shall be tested as a single cable. Cables shall not be split or divided into groups of conductors for this test.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.2℃	Relative Humidity	49%
Atmosphere Pressure	101kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Coupling Line	Test Levels(kV)	Polarity	Criteria	Results	Judgement
L	1	+	B	A	Pass
L	1	-	B	A	Pass
N	1	+	B	A	Pass
N	1	-	B	A	Pass
PE	1	+	B	/	/
PE	1	-	B	/	/
L-N	1	+	B	A	Pass
L-N	1	-	B	A	Pass
L1-PE	1	+	B	/	/
L1-PE	1	-	B	/	/
N-PE	1	+	B	/	/
N-PE	1	-	B	/	/
L-N-PE	1	+	B	/	/
L-N-PE	1	-	B	/	/
DC network power ports	0.5	+	B	A	Pass
DC network power ports	0.5	-	B	A	Pass

Observation:
A: No observable change.
Conclusion: The EUT met the requirements of the standard

8.5. SURGES (AC MAINS POWER PORTS)

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-5:2014
Criterion Required:	Performance criteria B
Wave Shape:	Tr/Th 1.2/50 us or 10/700 us
Test Level:	1 kV (Line to Line for AC mains power ports) 2 kV (Line to Ground for AC mains power ports) 1 kV (Lines to Ground for Analogue/Digital data ports) 0.5 kV (shield to ground for coaxial/shielded cable on Analogue/Digital data ports) 0.5 kV (each individual line to reference ground for DC network power ports)
Polarity:	Positive & Negative
Interval:	60s between each surge
No. of Surges:	Five positive pulses at 90° phase Five negative pulses at 270° phase

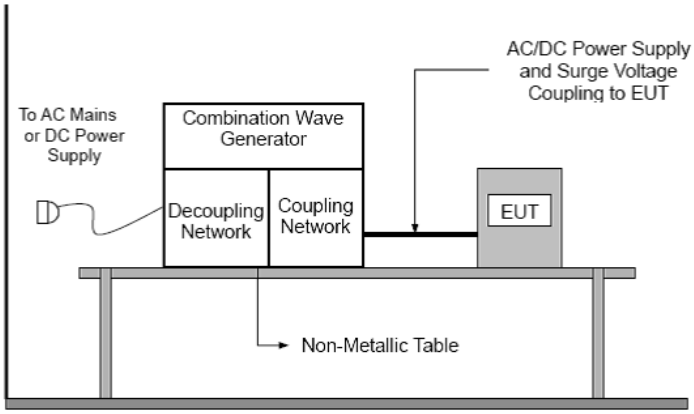
TEST PROCEDURE

a. The EUT and the auxiliary equipment were placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT was less than 2 meters (provided by the manufacturer).

b. The EUT was connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).

c. The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.2℃	Relative Humidity	49%
Atmosphere Pressure	101kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Coupling Line	Voltage(kV)	Polarity	Phase	Criteria	Result	Judgment
L-N	1	+	90°	B	A	Pass
L-N	1	-	90°	B	A	Pass
L-N	1	+	270°	B	A	Pass
L-N	1	-	270°	B	A	Pass
Signal Line	0.5	+	/	/	/	/
Signal Line	0.5	-	/	/	/	/

Observation:
A: No observable change.
Conclusion: The EUT met the requirements of the standard

8.6. CONTINUOUS INDUCED RF DISTURBANCES

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-6:2013
Criterion Required:	Performance criteria A
Test Level:	0.15 MHz to 10 MHz: 3 V (r.m.s) 10 MHz to 30 MHz: 3 to 1 V (r.m.s) 30 MHz to 80 MHz: 1 V (r.m.s)
Modulation:	80%, 1kHz Amplitude Modulation
Step Size:	1% increment
Dwell Time:	1s

TEST PROCEDURE

a. The EUT shall be tested within its intended operating and climatic conditions.

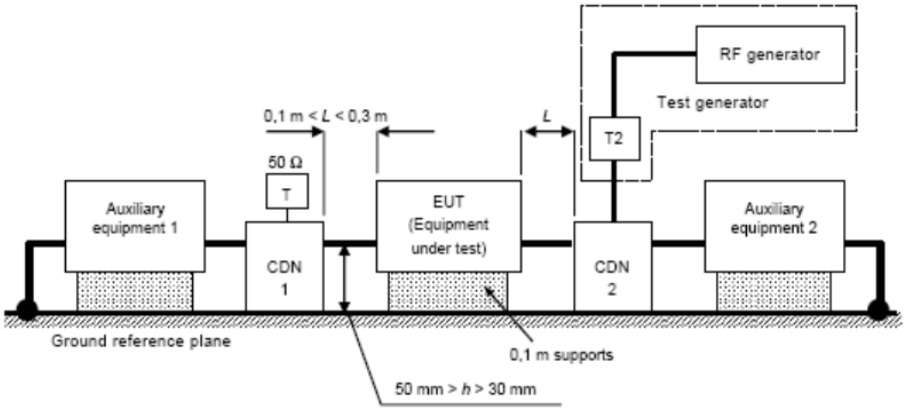
b. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

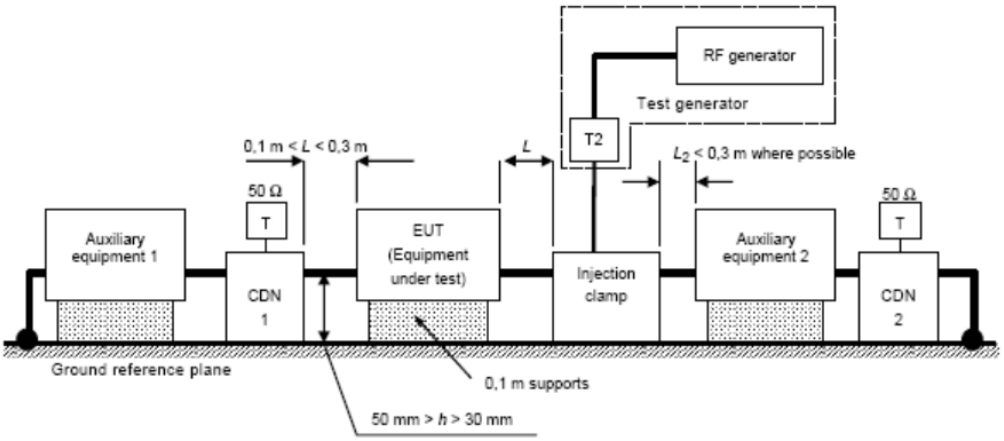
c. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate shall not exceed 1.5×10^{-3} decades/s. The step size shall not exceed 1 % of the start and thereafter 1 % of the preceding frequency value where the frequency is swept incrementally.

d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.

e. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

TEST SETUP





TEST ENVIRONMENT

Temperature	21.6℃	Relative Humidity	50%
Atmosphere Pressure	kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Test Ports (Mode)	Freq.Range (MHz)	Field Strength (unmodulated,r.m.s)	Criteria	Results	Judgment
AC mains power ports	0.15---10	3 V	A	A	Pass
AC mains power ports	10---30	3 V to 1V	A	A	Pass
AC mains power ports	30---80	1 V	A	A	Pass
DC network power ports	0.15---10	3 V	A	/	/
DC network power ports	10---30	3 V to 1V	A	/	/
DC network power ports	30---80	1 V	A	/	/
Analogue/digital data ports	0.15---10	3 V	A	A	Pass
Analogue/digital data ports	10---30	3 V to 1V	A	A	Pass
Analogue/digital data ports	30---80	1 V	A	A	Pass

Observation:
A: No observable change.
Conclusion: The EUT met the requirements of the standard

8.7. VOLTAGE DIPS AND INTERRUPTIONS (AC MAINS POWER PORTS)

TEST SPECIFICATION

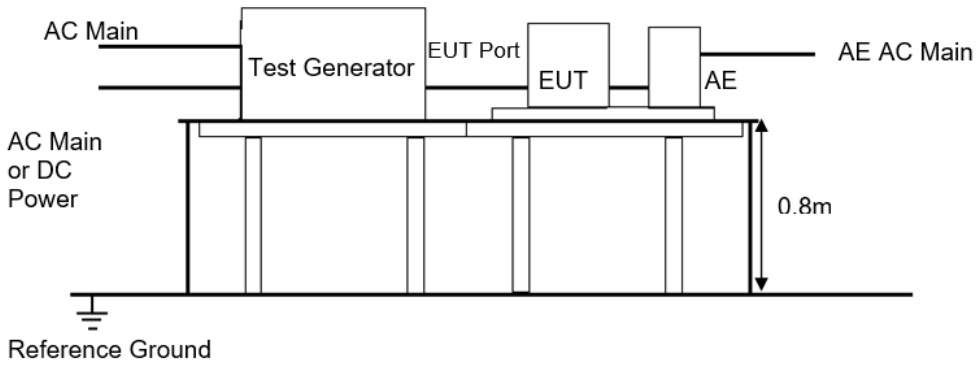
Standard:	EN 55035:2017/A11:2020 IEC 61000-4-11:2004
Criterion Required:	Voltage dips: performance criteria B or C; Interruptions: performance criteria C
Test Port:	AC mains power port
Test Level:	>95 % reduction: 0.5 period >30 % reduction: 25 period for 50Hz/ 30 period for 60Hz >95 % reduction: 250 period for 50Hz/ 300 period for 60Hz
No. of Dips / Interruptions:	3 per Level
Interval between Event:	Minimum 10 seconds
Phase Angle:	0°

TEST PROCEDURE

a. The power cord was used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.

b. Voltage reductions occur at 0 degree crossover point of the voltage waveform. The performance of the EUT was checked after the voltage dip or interruption.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.2℃	Relative Humidity	49%
Atmosphere Pressure	101kPa	Test Voltage	

TEST MODE

Test Mode:	M01

TEST RESULTS

Voltage（AC)	Interruption & Dips	Durations(T)	Volatge Reduction	Perform Criteria	Results	Judgment
230V 50Hz	Voltage dips	0.5 Cycles	>95%	B	A	Pass
230V 50Hz	Voltage dips	25 Cycles	30%	C	A	Pass
230V 50Hz	Voltage interruptions	250 Cycles	>95%	C	C	Pass
100V 60Hz	Voltage dips	0.5 Cycles	>95%	B	A	Pass
100V 60Hz	Voltage dips	30 Cycles	30%	C	A	Pass
100V 60Hz	Voltage interruptions	300 Cycles	>95%	C	C	Pass

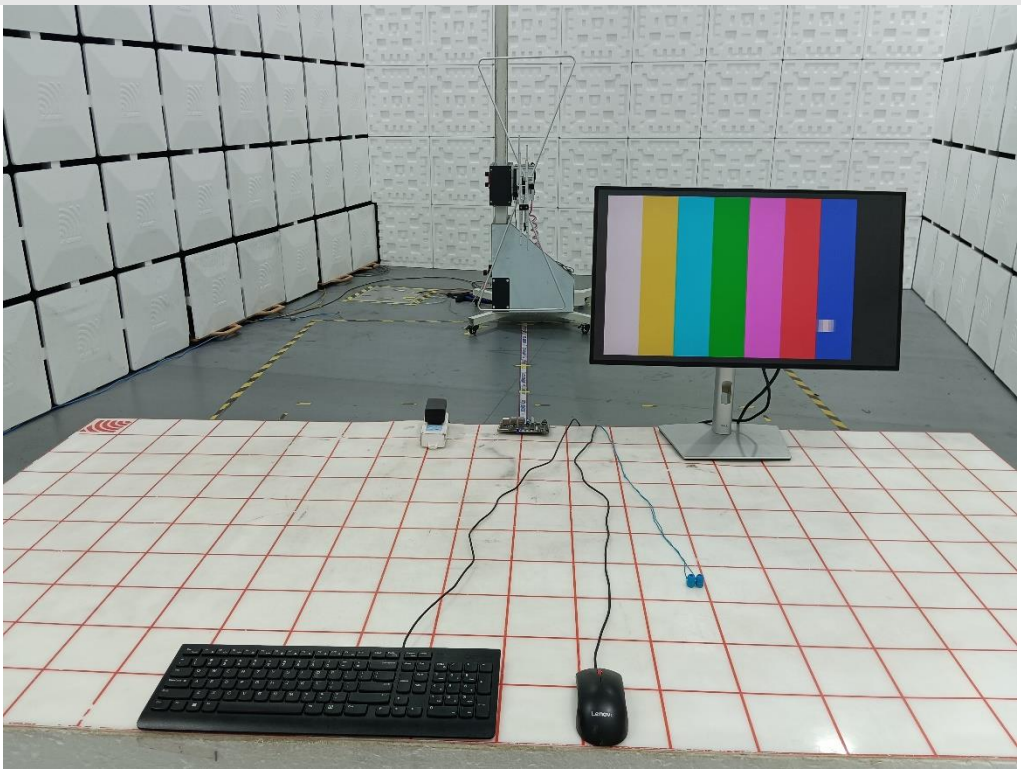
Observation:
A: No observable change.
Conclusion: The EUT met the requirements of the standard

APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

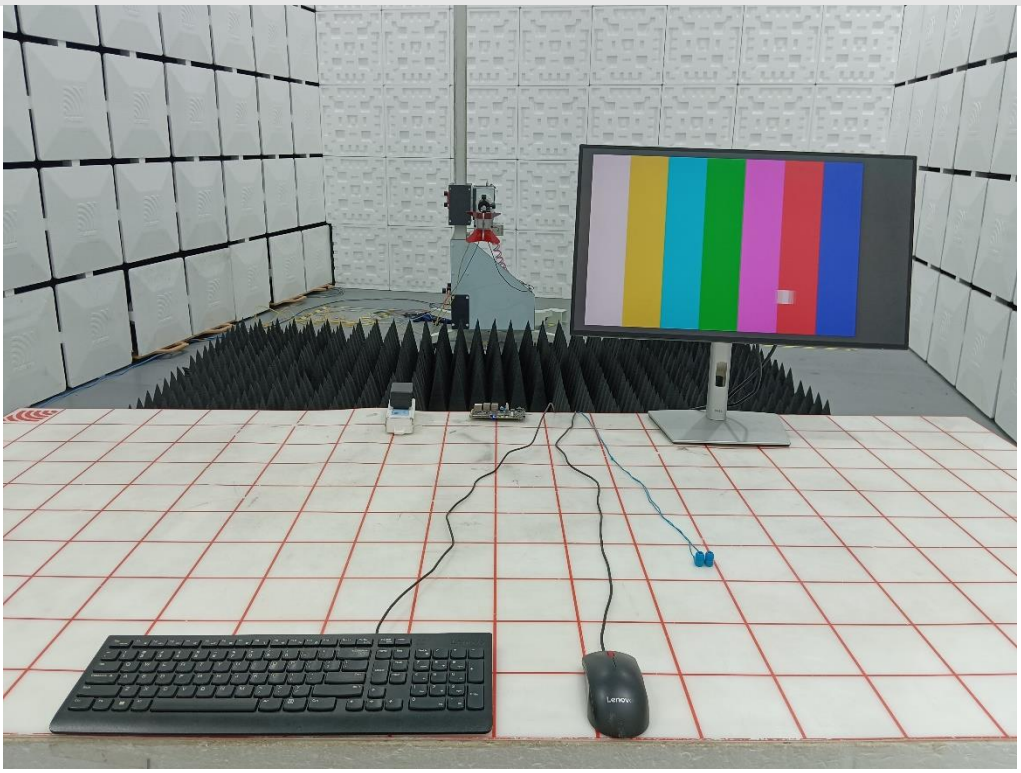
Conducted emissions (AC mains power ports)

Conducted emissions (Asymmetric mode)

Radiated emissions below 1GHz

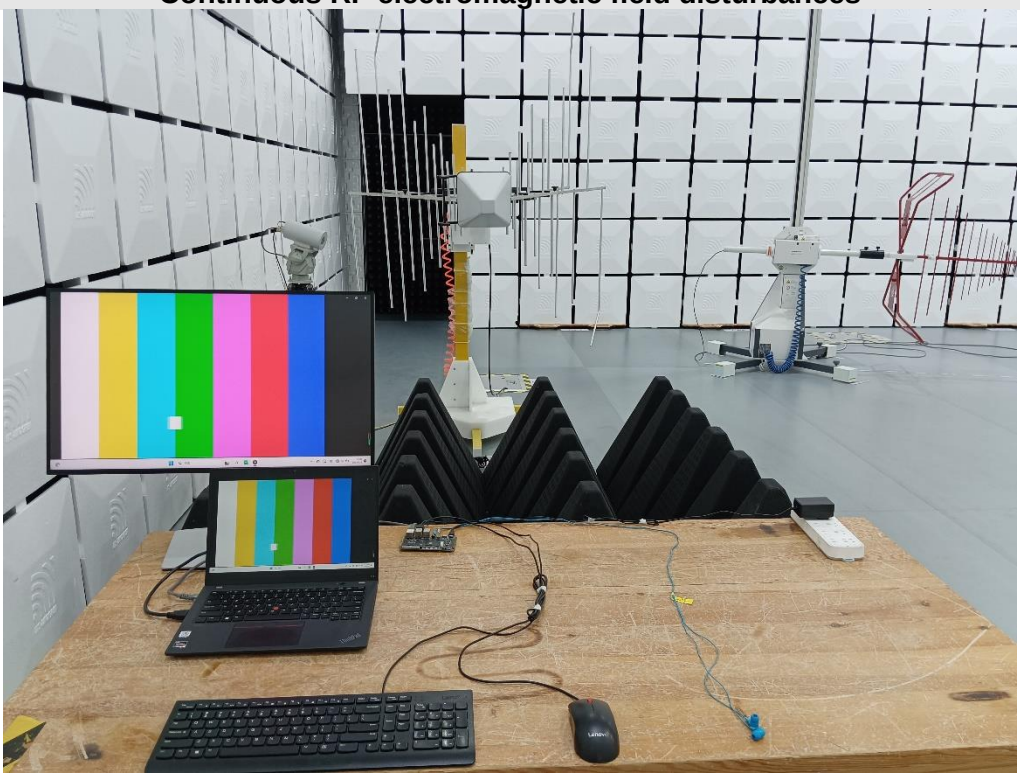


Radiated emissions above 1GHz



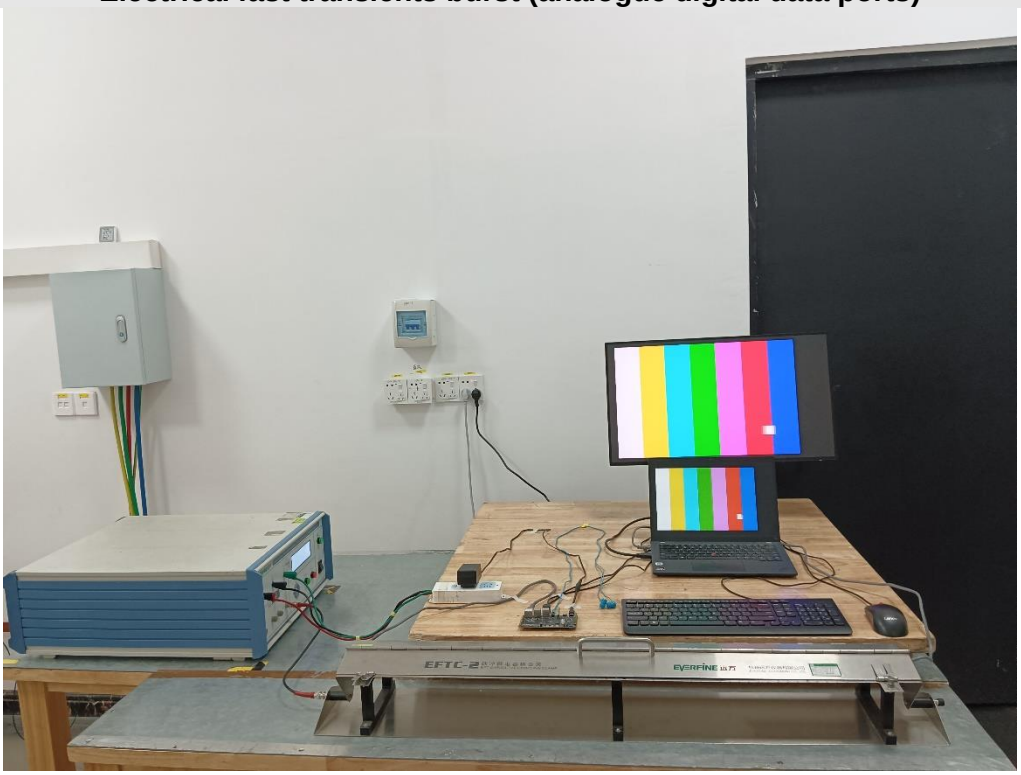
Electrostatic Discharge

Continuous RF electromagnetic field disturbances

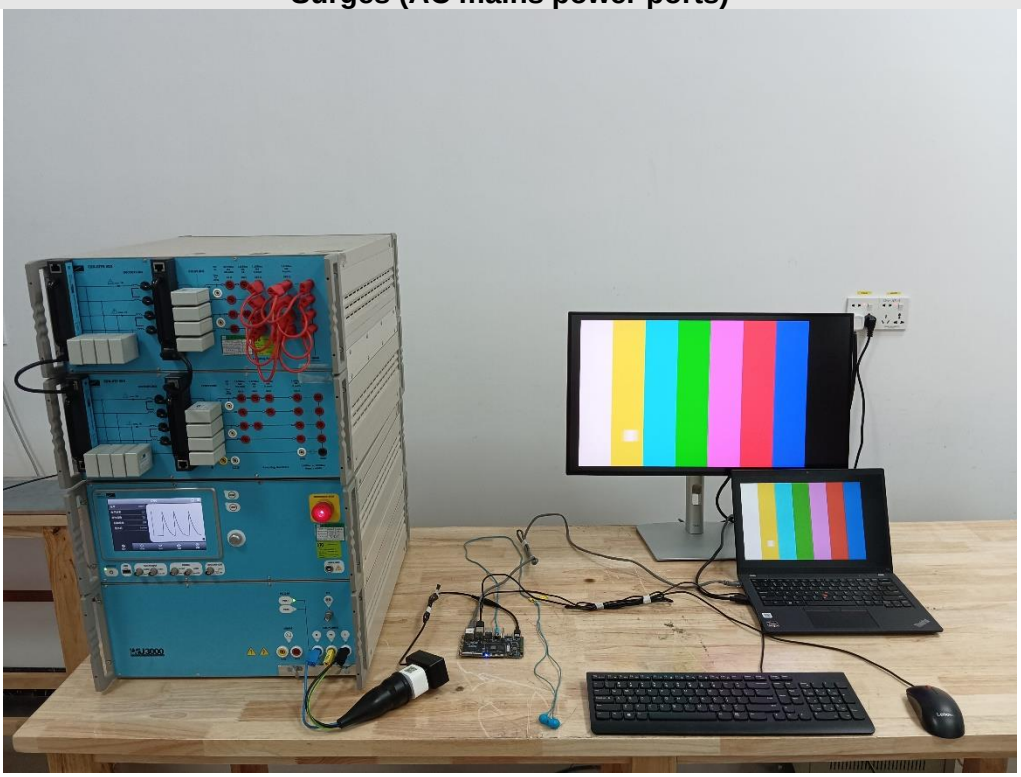


Electrical fast transients burst (AC mains power ports)

Electrical fast transients burst (analogue digital data ports)



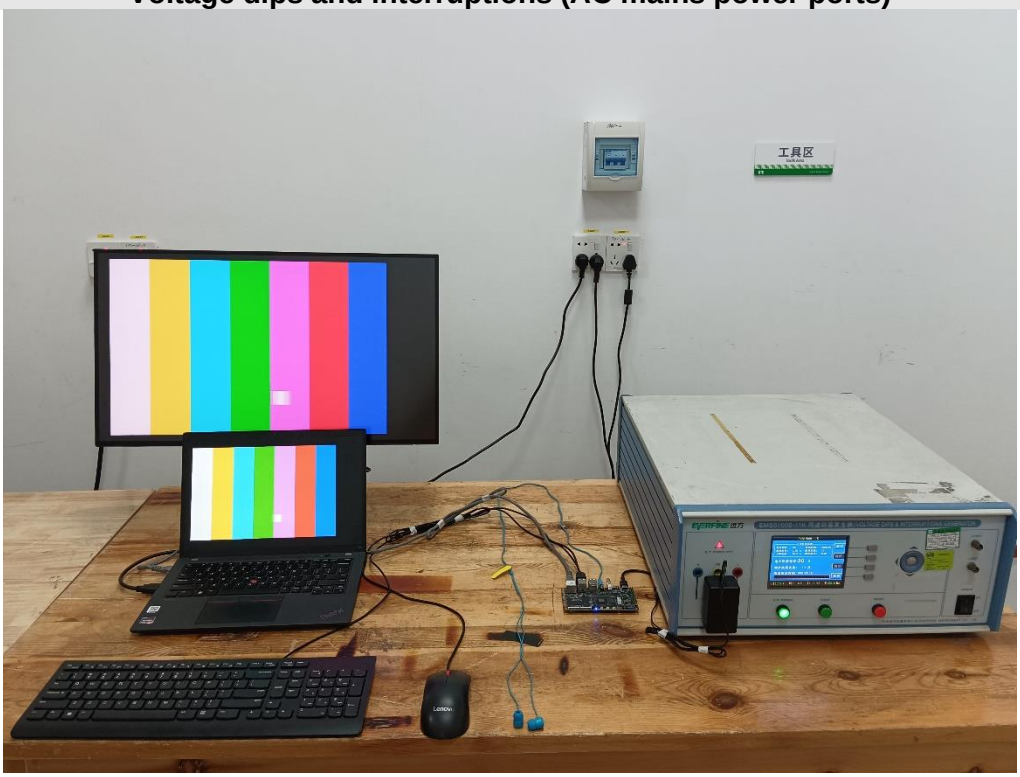
Surges (AC mains power ports)



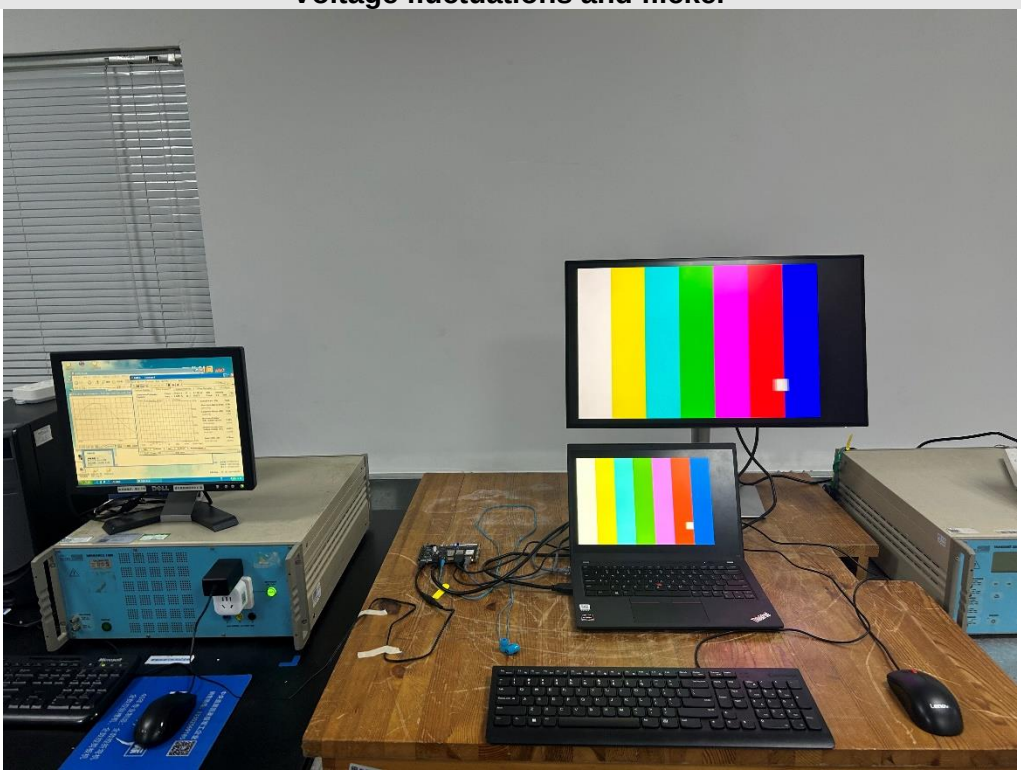
Continuous induced RF disturbances (AC mains power ports)

Continuous induced RF disturbances (analogue digital data ports)

Voltage dips and interruptions (AC mains power ports)

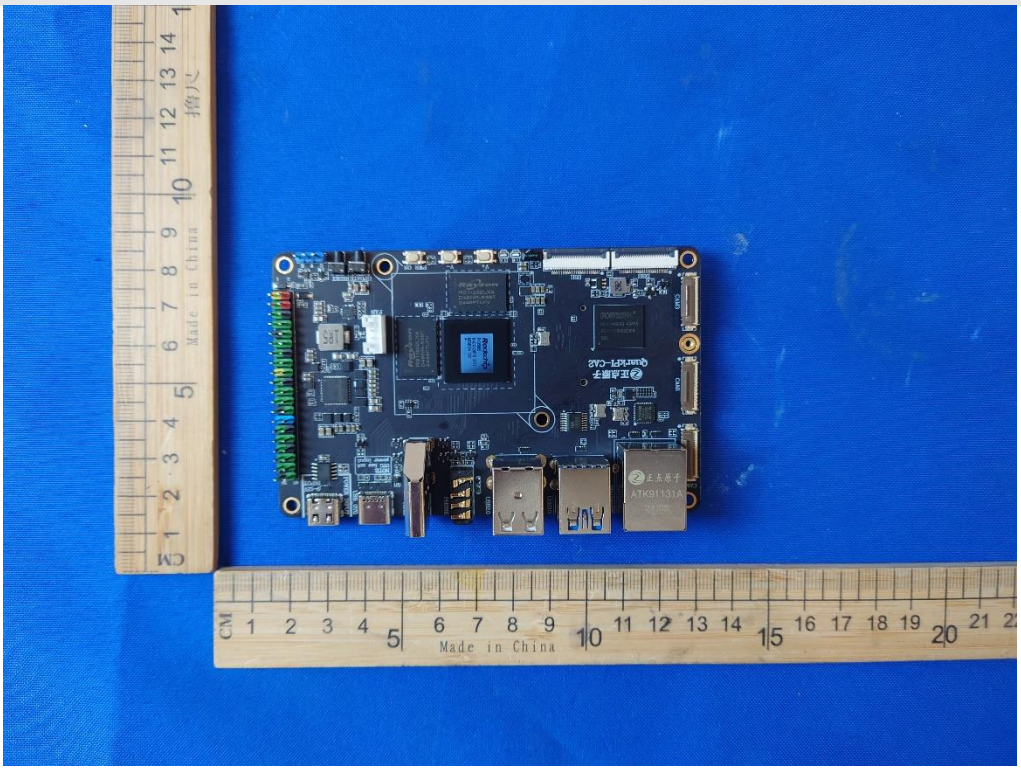


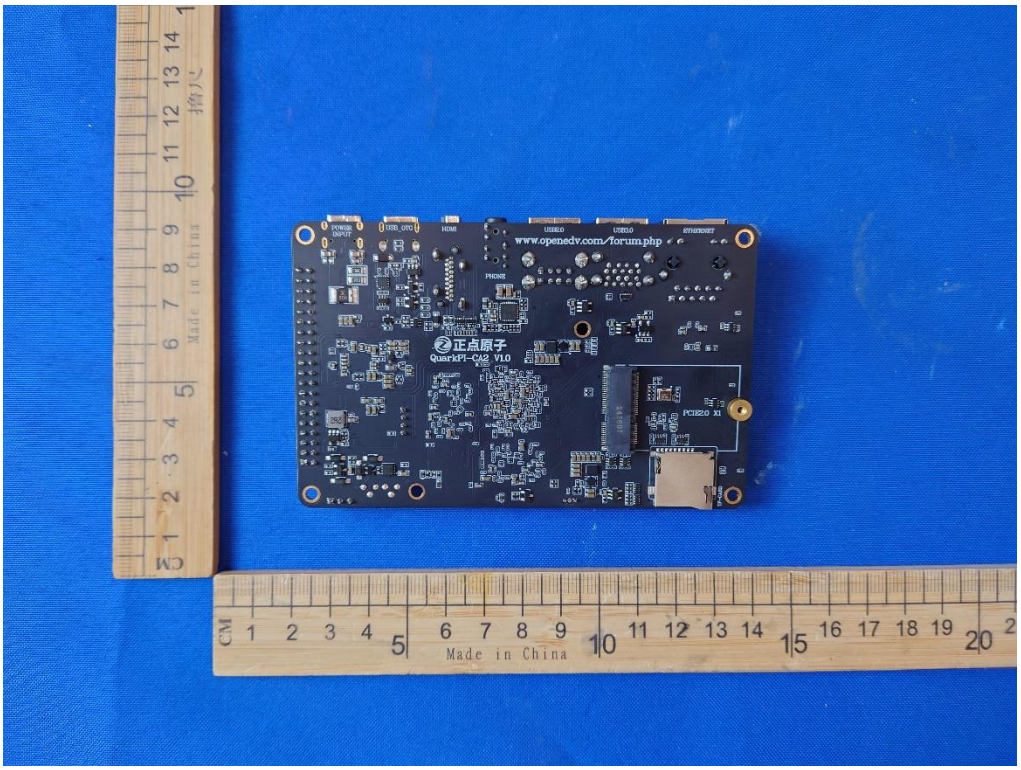
Voltage fluctuations and flicker



APPENDIX: PHOTOGRAPHS OF THE EUT

External





END OF REPORT