EMC TEST REPORT

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

MEASUREMENT AND TEST REPORT

For

OpenVox Communication Co., Ltd

Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District, Shenzhen ,Guangdong ,China

Model: UC200

2023-08-18

This Report Concerns:	**Equipment Type:**
♦ Original Report	IP-PBX

Test Engineer:	Leon Gao/ Leon Gao
Report Number:	TH2308099-C02-R01
Test Date:	2023-08-10 to 2023-08-18
Reviewed By:	Neo Dong/ Neo Dong
Approved By:	Prince Huang/ Prince Huang
Prepared By:	**Shenzhen Tian Hai Test Technology Co.,Ltd.** 125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China Tel : +86-755-86615100 Fax: +86-755-86615105

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of TianHai Compliance Testing Laboratory Ltd.

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1 - SUMMARY OF STANDARDS AND RESULTS

1.1 DESCRIPTION OF STANDARDS AND RESULTS

The EUT have been tested according to the applicable standards as referenced below.

EMISSION				
Description of Test Item	**Test Standard**	**Basic Standard**	**Requirement**	**Results**
Conducted disturbance	EN 55032:2015 /A11:2020	EN 55032:2015 /A11:2020	See Section 4	PASS
Radiated disturbance	EN 55032:2015 /A11:2020	EN 55032:2015 /A11:2020	See Section 5	PASS
Harmonic current emissions	EN IEC 61000-3-2 :2019/A1:2021	EN IEC 61000-3-2 :2019/A1:2021	See Section 6	N/A
Voltage fluctuations & flicker	EN 61000-3-3:2013 /A1:2019	EN 61000-3-3:2013 /A1:2019	See Section 7	N/A
IMMUNITY				
Description of Test Item	**Test Standard**	**Basic Standard**	**Test configuration**	**Results**
Electrostatic discharge (ESD)	EN 55032:2015 /A11:2020	IEC 61000-4-2:2008	See Section 8.1	PASS
Radio-frequency, Continuous radiated disturbance	EN 55032:2015 /A11:2020	IEC 61000-4-3:2020	See Section 8.2	PASS
Electrical fast transient (EFT)	EN 55032:2015 /A11:2020	IEC 61000-4-4:2012	See Section 8.3	PASS
Surge (Input a.c. power ports)	EN 55032:2015 /A11:2020	IEC 61000-4-5:2014 +AMD1:2017	See Section 8.4	PASS
Radio-frequency, Continuous conducted disturbance	EN 55032:2015 /A11:2020	IEC 61000-4-6:2013	See Section 8.5	PASS
Power frequency magnetic field*	/	/	See Note	N/A
Voltage dips and interruptions	EN 55032:2015 /A11:2020	IEC 61000-4-11:2020	See Section 8.6	PASS

Note:
N/A is an abbreviation for Not Applicable
"*" : The EUT does not contain devices susceptible to magnetic fields; therefore the Power-Frequency Magnetic Fields test is not necessary.

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1.2 DESCRIPTION OF PERFORMANCE CRITERIA

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

— essential operational modes and states;
— tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse,etc.);
— quality of software execution;
— quality of data display and transmission;
— quality of speech transmission.

1.2.1 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 manufacture 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 deliver from the product description
and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.2 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 manufacture, 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 operation 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 deliver from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.3 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 manufacture’s instructions.

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

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2 - GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST EUT

Client Information

Applicant:	OpenVox Communication Co., Ltd
Address:	Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District, Shenzhen ,Guangdong ,China
Manufacturer:	OpenVox Communication Co., Ltd
Address:	Room 201, Building I, Jinchangda, Building 00082, Shangwei Industrial Zone, Zhangkengjing Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China

General Description of E.U.T

EUT Name:	IP-PBX
Trade Mark:	OpenVox
Model No.:	UC200
Sample No.:	TH2308099
Ratings:	AC adapter Input : AC 100-240V, 50/60Hz , 0.75A max Output: DC 12V ,2A, 24W
Test Mode:	Connected to the notebook
Note:	N/A

2.2 STATEMENT OF THE MEASUREMENT UNCERTAINTY TEST FACILITY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration Limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16-4-2 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN ENISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

2.3 MEASUREMENT UNCERTAINTY

Test Item	Frequency Range	Expanded Uncertainty(U_{lab})	Expanded Uncertainty(U_{cispr})
Conducted disturbance at mains terminals	9kHz to 150kHz 150kHz to 30MHz	±2.63 dB ±2.36 dB	±3.8 dB ±3.4 dB
Radiated disturbance	30MHz to 1GHz	±5.78 dB	±6.3 dB
Mains Harmonic	Voltage	± 1.80%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.64%	N/A

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(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

(3) The measurement uncertainty is not included in the test result.

2.4 TEST LOCATION

All tests were performed at Shenzhen Tianhai Test Technology Co., Ltd.
125-126, No.66, Zhangge Road ,Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong Province, P.R. China

2.5 PRINCIPLE OF CONFIGURATION SELECTION

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.
Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

2.6 TEST OPERATION

Test operation refers to test setup in chapter 4 & 5 & 6 & 7 & 8
Pretest in all operation modes, and find out the worst case for compliance test.

2.7 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

The EUT was tested together with the following accessories:

Kind of Equipment	Manufacturer	M/N	S/N
Notebook	Dell	OptiPlex 3050	/

The EUT was tested with following cables:

Cable name	Length (m)	Shield	Core No.
/	/	/	/

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3 - TEST EQUIPMENT LIST AND DETAILS

Kind of Equipment	Manufacturer	Type	S/N	Calibrate until
Conducted Emission				
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2023-11-13
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2023-11-13
Pulse Limiter	Schwarzbeck	VTSD 9561-F	847	2023-11-13
Test software	EZ	EMC-CON 3A1.1	/	/
Disturbance power				
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
EMI Absorbing Clamp	Teseq	MDS 21B	58115	2023-11-20
Test software	EZ	EMC-CON 3A1.1	/	/
LLAS Radiated Disturbance (2m)				
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
Loop Antenna	Schwarzbeck	HXYZ 9170	353	2023-11-13
Test software	EZ	EMC-CON 3A1.1	/	/
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2023-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2024-04-20
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2023-11-20
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2023-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2023-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5372	20210331001	2023-11-13
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2023-11-13
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2023-11-20
Test software	FALA	/	FA-03A2 RE	/
Harmonics & Flicker				
5kVA AC Power Source	AMETEK CTS	5001iX-CTS-400	2046A03237	2023-11-13
Signal Conditioning Unit	AMETEK CTS	PACS-1	2046A03238	2023-11-13
Test software	AMETEK CTS	CTS 4	Version 4.26.0	/
Electrostatic discharge (ESD)				
ESD Simulator	TESEQ	NSG 437	1569	2023-11-15

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Radio-frequency,Continuous radiated disturbance (RS)				
Signal generator	R&S	SMB 100A	113650	2024-04-20
Power meter	Agilent	E4417A	MY45100899	2024-04-20
Power sensor	Agilent	E9321A	US40390494	2024-04-20
Power sensor	Agilent	E9322A	MY44420219	2024-04-20
Power amplifier	Micotop	MPA-80-1000-250	MPA2112426	2024-04-20
Power amplifier	Micotop	MPA-1000-6000-100	MPA2201013	2024-04-20
Stacked Log. Periodic Antenna	Schwarzbeck	STLP 9129	201	N/A
Field strength probe	PMM	EP601	811ZX10673	2024-04-20
RF Switch	Emtrace	SW X4	/	N/A
Test Software	Emtrace	EM 3	V1.2.1	N/A
Electrical fast transient (EFT)				
Burst Tester	3C TEST	EFT 500T	ES027000120015	2023-11-13
Coupling Clamp	3C TEST	CCC 100	CCC 20092269	2023-11-13
CCS	3C TEST	V4.2.7	ES027000120015	/
Surge				
Surge simulator	3C TEST	CWS 600CT	ES058000920005	2023-11-13
Three phases CDN	3C TEST	SPN 3832T	ES0911910	2023-11-13
CDN for unshielded symmetrical high-speed Telecom cable	3C TEST	CDN405T8A	ES064001220010	2023-11-13
CDN for Telecom cable	3C TEST	CDN405M40-5	ES1071910	2023-11-13
CWS	3C TEST	V1.0.5.2	ES058000920005	/
Radio-frequency,Continuous conducted disturbance (CS)				
Conducted Immunity Test System	3C TEST	CST 1075	ES096000120008	2023-11-13
6dB Attenuator	3C TEST	DTC75-6	ES095000120006	2023-11-13
Single phase CDN	3C TEST	CDN M2M3	ES064002620007	2023-11-13
Three phases CDN	3C TEST	CDN M5-16	ES064003320004	2023-11-13
Calibration Set	3C TEST	CDN 100KIT	ES064002820016	2023-11-13
Calibration Set	3C TEST	EM CL100KIT	EM C20032816	2023-11-13
EM-Clamp	3C TEST	EM CL100	EM C20032811	2023-11-13

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EMC-s	SKET	V1.4.0.54	/	/
Power Frequency Magnetic Field (PFMF)				
PFMF simulator	3C TEST	MFS 400	ES045000720001	2023-11-13
Transformer	3C TEST	MFT 400	ES046000220003	2023-11-13
Magnetic field antenna	3C TEST	TCXS111	TCXS20060910	2023-11-13
CWS	3C TEST	V4.2.7	ES045000720001	/
Voltage dips &Voltage interruptions				
Power failure simulator	3C TEST	PFS 2216SD	ES049001220003	2023-11-13
CCS	3C TEST	V4.2.8	ES049001220003	/

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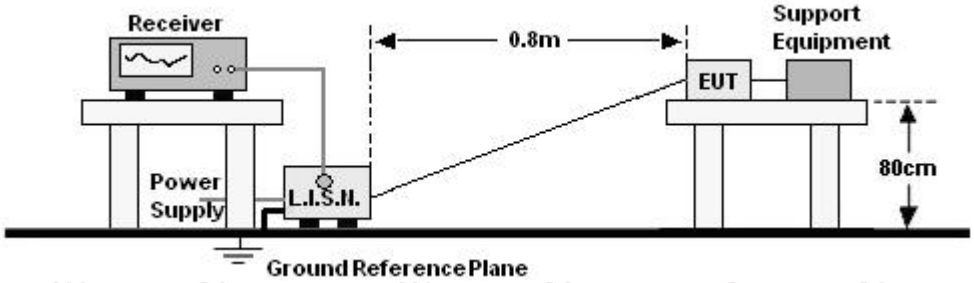
4 - CONDUCTED EMISSION MEASUREMENT

4.1 BLOCK DIAGRAM OF TEST SETUP



4.2 LIMITS

Frequency Range (MHz)	Class B Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56*	56～46*
0.500～5.000	56	46
5.000～30.00	60	50

Remark: * means decreasing linearly with logarithm of frequency.
Lower limits are used at the frequency junction

4.3 TEST PROCEDURE

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through a Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55032:2015/A11:2020 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated. The scanning waveform please refer to the next page.

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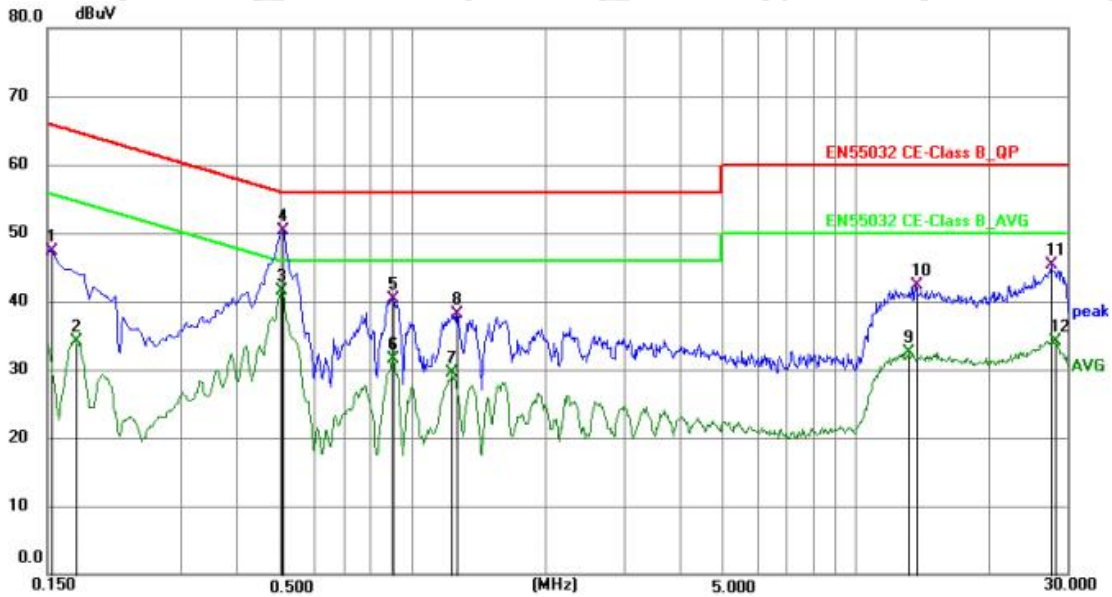
4.4 TEST RESULTS AND DATA

EUT:	IP-PBX
M/N:	UC200
Test Mode:	Connected to the notebook
Test Voltage:	AC 120V/60Hz & AC 230V/50Hz
Temperature:	23℃
Humidity:	55%
Atmosphere pressure:	101Kpa
Test Results:	Pass

AC 120V/60Hz
Phase:L1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1532	36.64	10.57	47.21	65.82	-18.61	QP	P
2	0.1725	23.54	10.57	34.11	54.84	-20.73	AVG	P
3 *	0.5055	30.90	10.62	41.52	46.00	-4.48	AVG	P
4	0.5100	39.68	10.62	50.30	56.00	-5.70	QP	P
5	0.9015	29.67	10.65	40.32	56.00	-15.68	QP	P
6	0.9060	20.79	10.65	31.44	46.00	-14.56	AVG	P
7	1.2300	18.86	10.66	29.52	46.00	-16.48	AVG	P
8	1.2570	27.49	10.66	38.15	56.00	-17.85	QP	P
9	13.1365	21.75	10.81	32.56	50.00	-17.44	AVG	P
10	13.6855	31.55	10.82	42.37	60.00	-17.63	QP	P
11	27.6130	34.30	10.94	45.24	60.00	-14.76	QP	P
12	28.1665	23.23	10.94	34.17	50.00	-15.83	AVG	P

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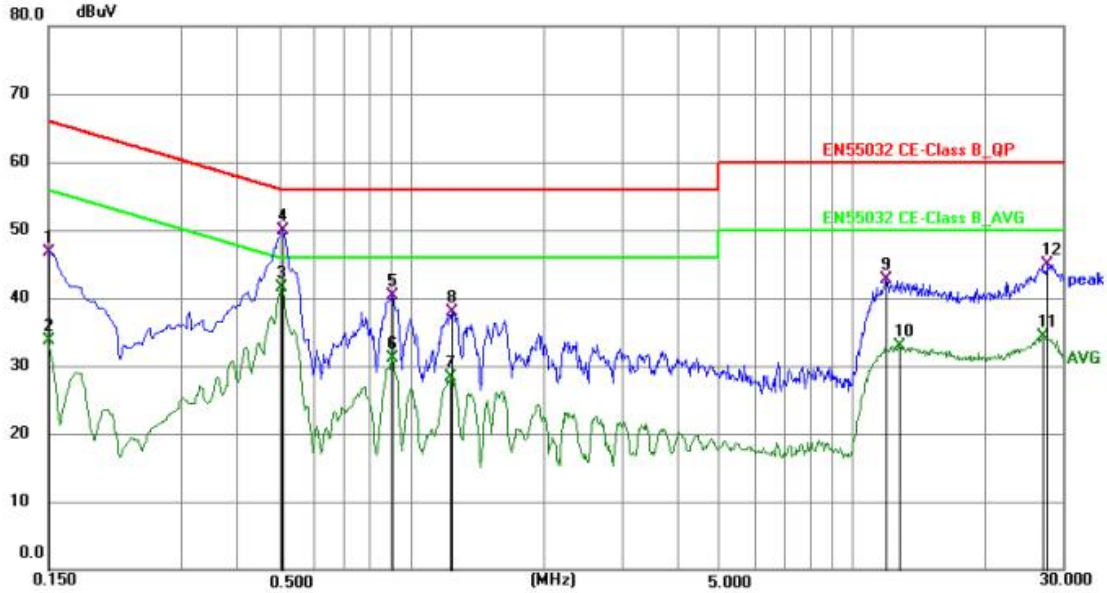
Phase:N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1500	36.21	10.57	46.78	66.00	-19.22	QP	P
2	0.1500	23.19	10.57	33.76	56.00	-22.24	AVG	P
3 *	0.5055	30.81	10.62	41.43	46.00	-4.57	AVG	P
4	0.5100	39.37	10.62	49.99	56.00	-6.01	QP	P
5	0.9060	29.66	10.65	40.31	56.00	-15.69	QP	P
6	0.9060	20.42	10.65	31.07	46.00	-14.93	AVG	P
7	1.2300	17.57	10.66	28.23	46.00	-17.77	AVG	P
8	1.2390	27.28	10.66	37.94	56.00	-18.06	QP	P
9	11.9890	31.84	10.86	42.70	60.00	-17.30	QP	P
10	12.7180	22.14	10.85	32.99	50.00	-17.01	AVG	P
11	27.0640	23.40	10.94	34.34	50.00	-15.66	AVG	P
12	27.8290	34.01	10.94	44.95	60.00	-15.05	QP	P

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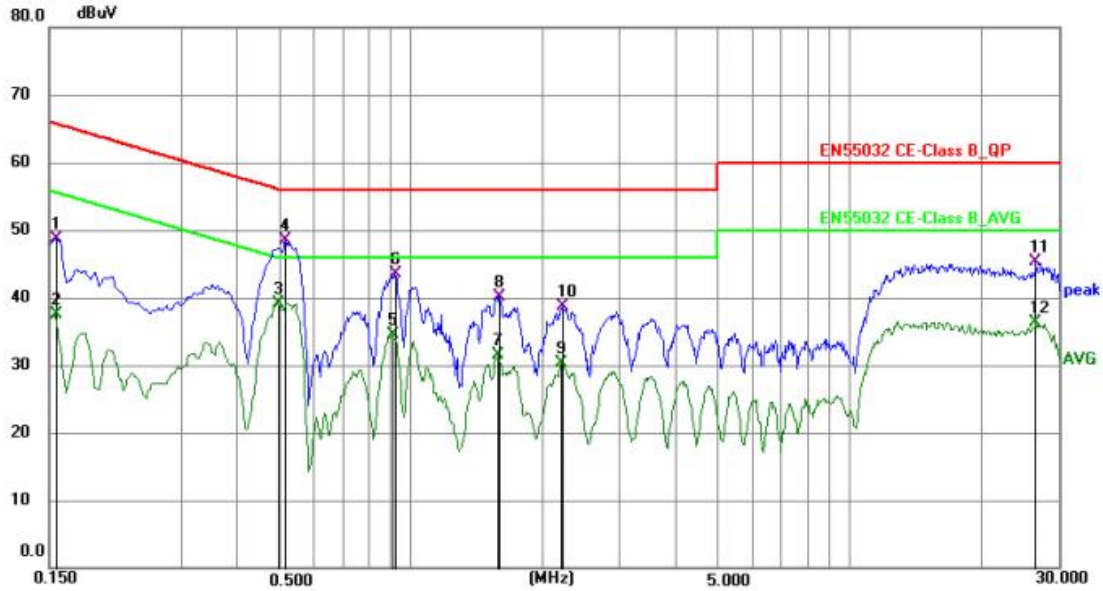
AC 230V/50Hz
Phase:L1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1545	38.18	10.57	48.75	65.75	-17.00	QP	P
2	0.1545	26.91	10.57	37.48	55.75	-18.27	AVG	P
3 *	0.4965	28.47	10.62	39.09	46.06	-6.97	AVG	P
4	0.5190	37.96	10.62	48.58	56.00	-7.42	QP	P
5	0.9105	23.78	10.65	34.43	46.00	-11.57	AVG	P
6	0.9195	32.89	10.66	43.55	56.00	-12.45	QP	P
7	1.5809	20.83	10.68	31.51	46.00	-14.49	AVG	P
8	1.5855	29.45	10.68	40.13	56.00	-15.87	QP	P
9	2.2065	19.58	10.68	30.26	46.00	-15.74	AVG	P
10	2.2155	28.09	10.68	38.77	56.00	-17.23	QP	P
11	26.6095	34.32	10.94	45.26	60.00	-14.74	QP	P
12	26.6095	25.32	10.94	36.26	50.00	-13.74	AVG	P

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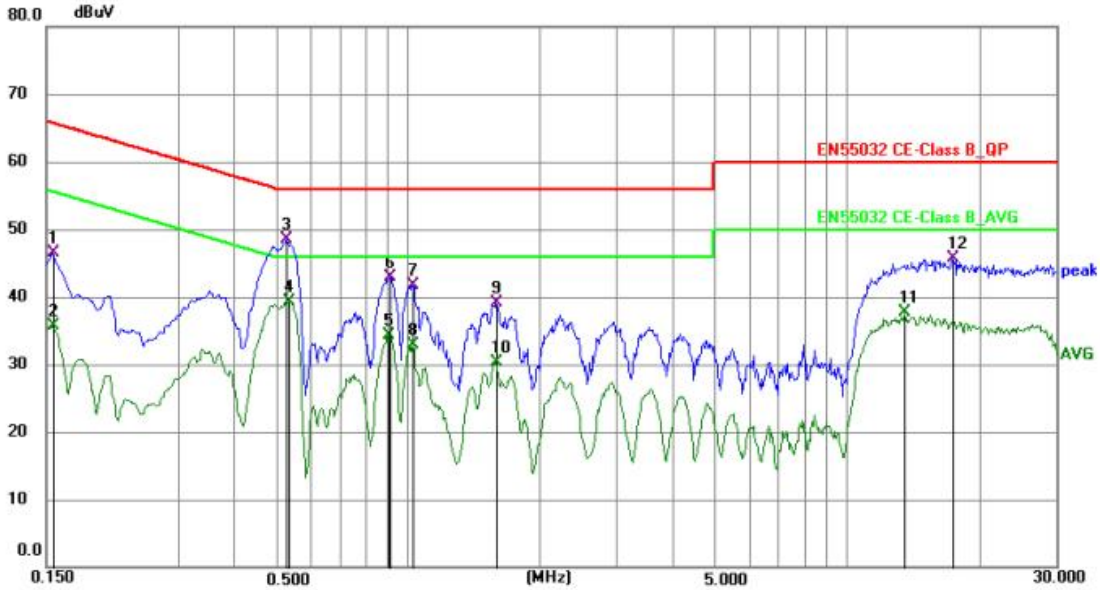
Phase:N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1545	35.97	10.57	46.54	65.75	-19.21	QP	P
2	0.1545	25.13	10.57	35.70	55.75	-20.05	AVG	P
3	0.5280	37.88	10.62	48.50	56.00	-7.50	QP	P
4 *	0.5370	28.78	10.62	39.40	46.00	-6.60	AVG	P
5	0.9060	23.64	10.65	34.29	46.00	-11.71	AVG	P
6	0.9150	32.30	10.65	42.95	56.00	-13.05	QP	P
7	1.0230	30.95	10.66	41.61	56.00	-14.39	QP	P
8	1.0275	22.16	10.66	32.82	46.00	-13.18	AVG	P
9	1.5855	28.38	10.68	39.06	56.00	-16.94	QP	P
10	1.5855	19.69	10.68	30.37	46.00	-15.63	AVG	P
11	13.5820	26.91	10.85	37.76	50.00	-12.24	AVG	P
12	17.3890	34.89	10.89	45.78	60.00	-14.22	QP	P

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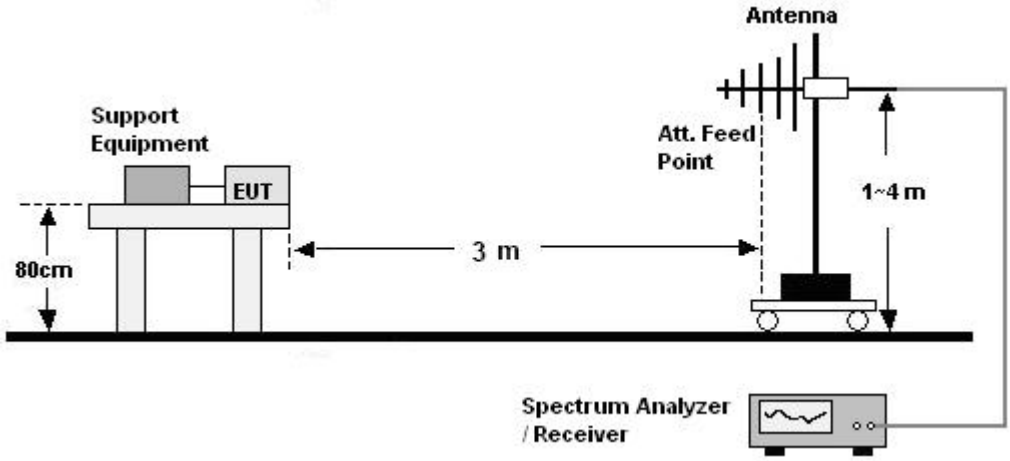
5- RADIATED DISTURBANCE MEASUREMENT

5.1 BLOCK DIAGRAM OF TEST SETUP



5.2 LIMITS

Frequency (MHz)	Class B Quasi-peak Limits at 3m dB(μV/m)
30-230	40
230-1000	47

NOTE: The lower limit shall apply at the transition frequencies.

5.3 TEST PROCEDURE

a. The Product was placed on the non-conductive turntable 0.8/0.1 m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna’ s height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value

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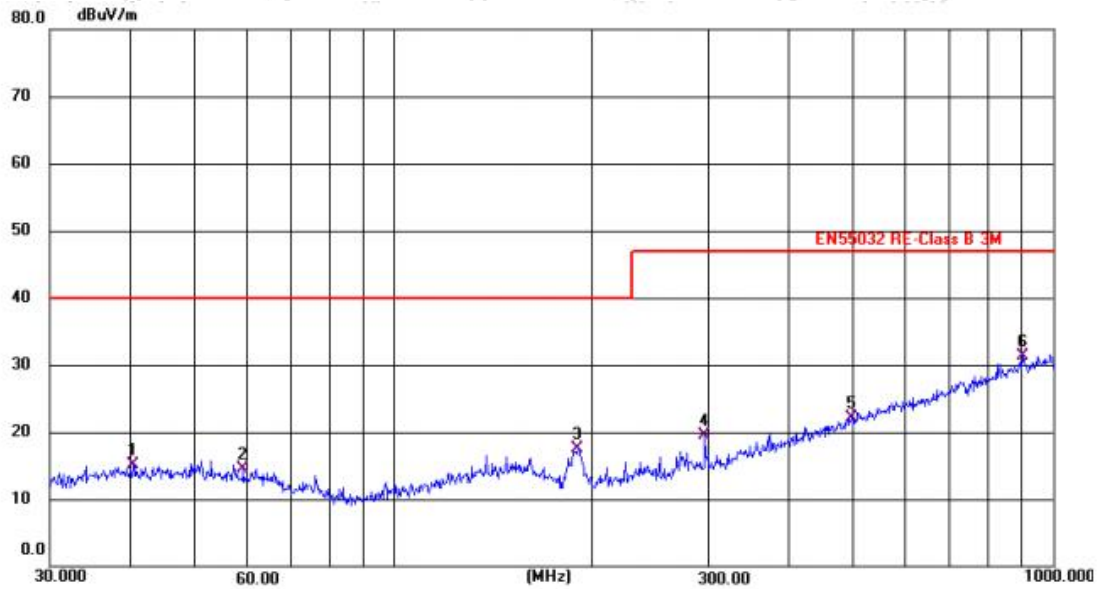
5.4 TEST RESULTS AND DATA

EUT:	IP-PBX
M/N:	UC200
Test Mode:	Connected to the notebook
Test Voltage:	AC 120V/60Hz & AC 230V/50Hz
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa
Test Results:	Pass

AC 120V/60Hz
Polarization:Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	40.2122	29.62	-14.59	15.03	40.00	-24.97	QP
2	59.1080	30.02	-15.49	14.53	40.00	-25.47	QP
3	190.8059	35.61	-18.01	17.60	40.00	-22.40	QP
4	296.6514	34.65	-15.11	19.54	47.00	-27.46	QP
5	494.3718	31.70	-9.51	22.19	47.00	-24.81	QP
6 *	901.4109	33.66	-2.27	31.39	47.00	-15.61	QP

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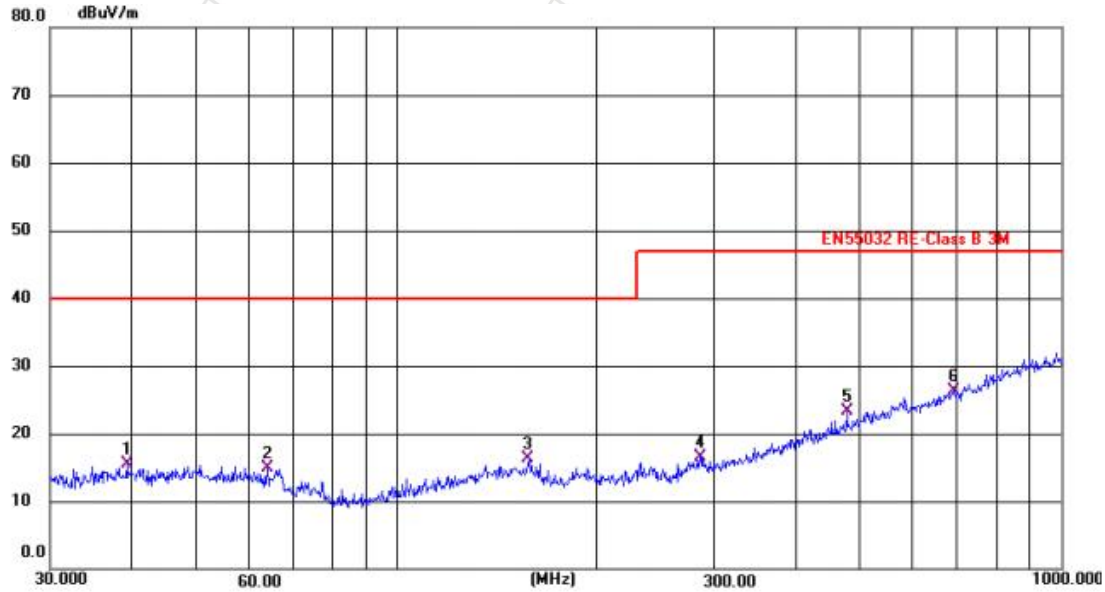
Polarization:Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.2509	30.18	-14.72	15.46	40.00	-24.54	QP
2	63.8707	31.22	-16.36	14.86	40.00	-25.14	QP
3	158.3897	31.85	-15.47	16.38	40.00	-23.62	QP
4	286.8817	31.32	-14.88	16.44	47.00	-30.56	QP
5	475.9161	33.32	-9.94	23.38	47.00	-23.62	QP
6 *	689.6853	32.36	-6.04	26.32	47.00	-20.68	QP

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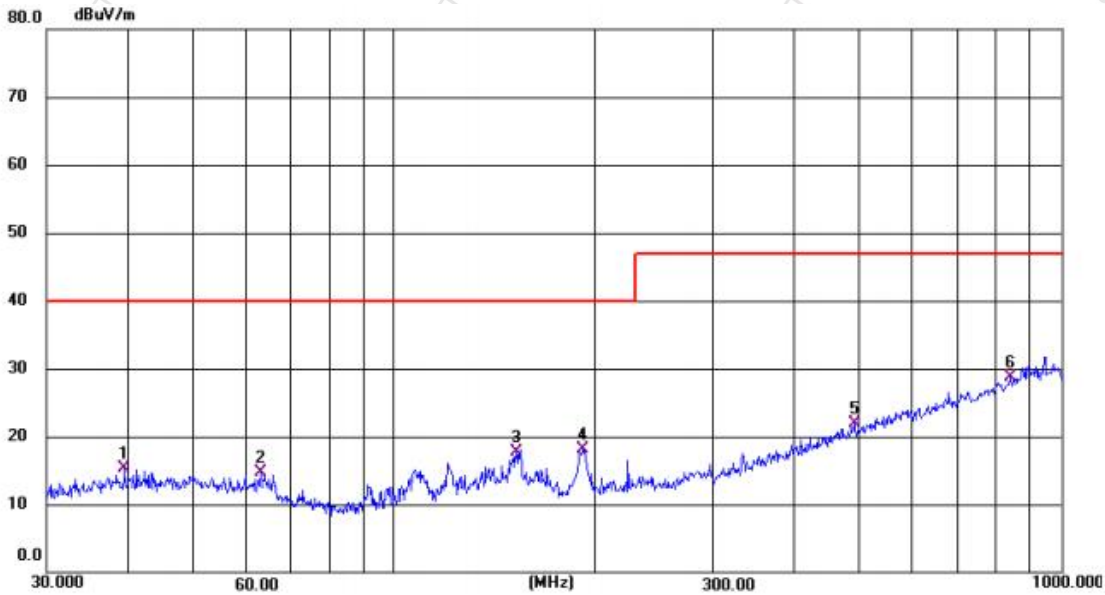
AC 230V/50Hz
Polarization:Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.4025	30.05	-14.69	15.36	40.00	-24.64	QP
2	62.9810	30.97	-16.18	14.79	40.00	-25.21	QP
3	152.3163	33.26	-15.52	17.74	40.00	-22.26	QP
4	191.9805	36.24	-18.06	18.18	40.00	-21.82	QP
5	490.2287	31.47	-9.61	21.86	47.00	-25.14	QP
6 *	839.9175	31.89	-3.12	28.77	47.00	-18.23	QP

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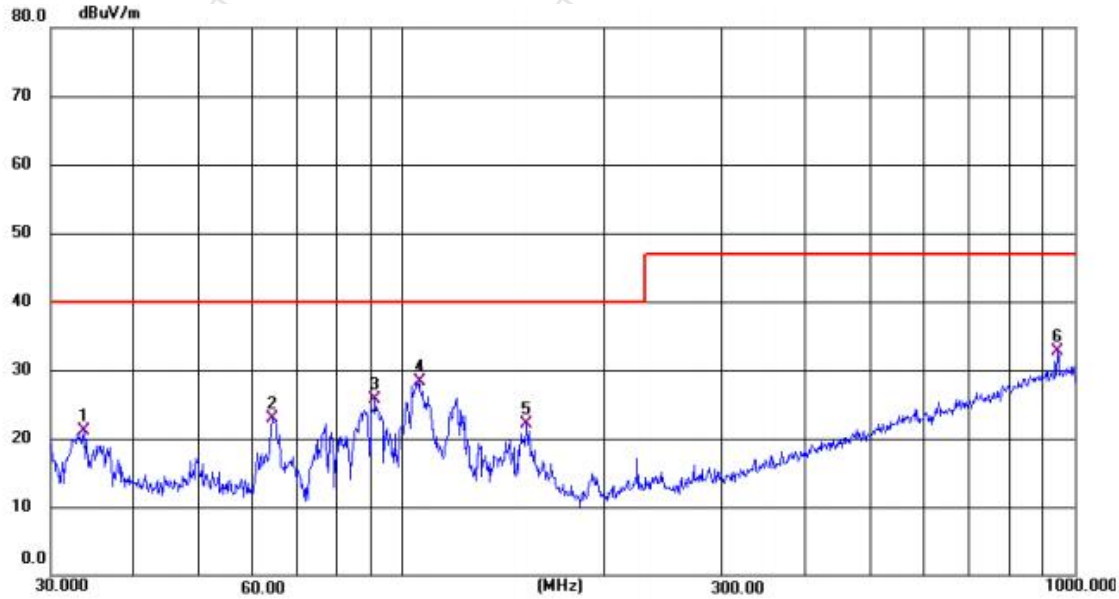
Polarization:Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	33.6921	36.92	-15.76	21.16	40.00	-18.84	QP
2	64.3991	39.41	-16.47	22.94	40.00	-17.06	QP
3	91.1905	45.05	-19.40	25.65	40.00	-14.35	QP
4 *	106.3291	46.19	-17.92	28.27	40.00	-11.73	QP
5	153.3882	37.67	-15.51	22.16	40.00	-17.84	QP
6	944.9424	34.50	-1.86	32.64	47.00	-14.36	QP

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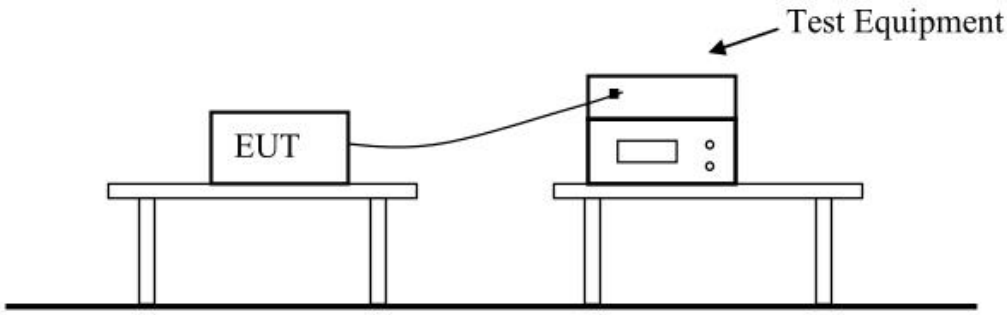
6 - HARMONIC CURRENT EMISSION MEASUREMENT

6.1 BLOCK DIAGRAM OF TEST SETUP



6.2 TEST STANDARD

Please refer to EN IEC 61000-3-2:2019/A1:2021

6.3 TEST PROCEDURE

a. The Product was placed on the top of a non-conductive table above the ground and operated to produce the maximum harmonic components under normal Test Modes for each successive harmonic component in turn.

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

6.4 TEST RESULTS

N/A

The EUT's rated power is less than 75W .Therefore harmonic current test is not applicable in accordance with Clause 7 of EN IEC 61000-3-2:2019/A1:2021.

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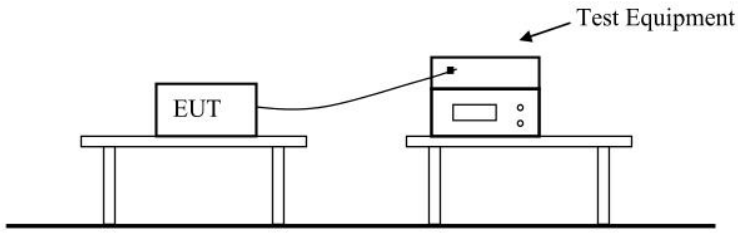
7 - VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

7.1 BLOCK DIAGRAM OF TEST SETUP



7.2 TEST STANDARD

Please refer to EN 61000-3-3:2013/A1:2019

7.3 TEST PROCEDURE

a. The Product was placed on the top of a non-conductive table above the ground and operated to produce the most unfavorable sequence of voltage changes under normal Test Modes.

b. During the flick test, the measure time shall include that part of whole operation cycle in which the Product procedure the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

7.4 TEST RESULTS

N/A

The active power of the EUT is about 24W only, which unlikely to produce significant voltage fluctuation. Therefore no test was applied.

See “EN 61000-3-3:2013/A1:2019, clause 6.1” Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker....” .

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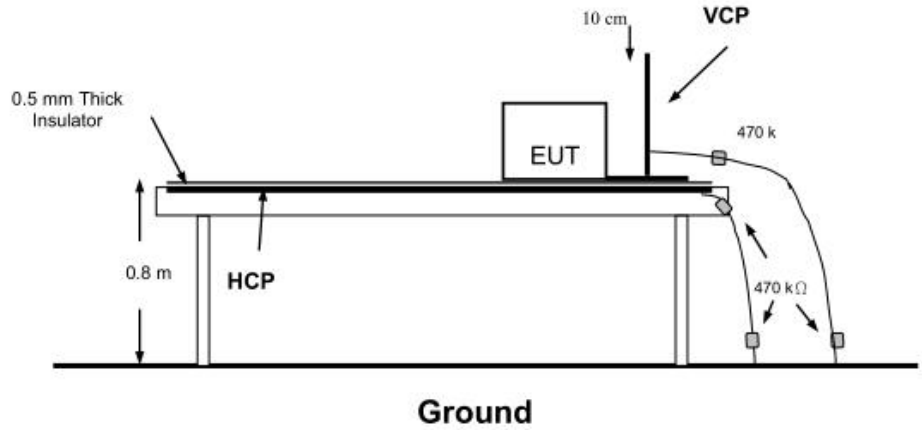
8 - IMMUNITY TEST

8.1 ELECTROSTATIC DISCHARGE IMMUNITY TEST

8.1.1 Block Diagram of Test Setup



8.1.2 Test Specification

Basic Standard	:	IEC 61000-4-2:2008
Test Port	:	Enclosure port
Discharge Impedance	:	330 ohm / 150 pF
Discharge Mode	:	Single Discharge
Discharge Period	:	one second between each discharge

8.1.3 Test Procedure

8.1.3.1. Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all
the air discharge completed.

8.1.3.2. Contact Discharge

All the procedure shall be same as Section 8.1.3.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.1.3.3. Indirect Discharge for Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

8.1.3.4. Indirect Discharge for Vertical Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.1.4 Test Results

Electrostatic Discharge	
Basic Standard:	IEC 61000-4-2:2008
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 230V/50Hz
Temperature:	25℃
Humidity:	55%
Atmosphere pressure:	101Kpa

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Performance criterion	Results
Contact Discharge	Conductive Surfaces	4	10	B	Pass
	Indirect Discharge HCP	4	10	B	Pass
	Indirect Discharge VCP	4	10	B	Pass
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	B	Pass

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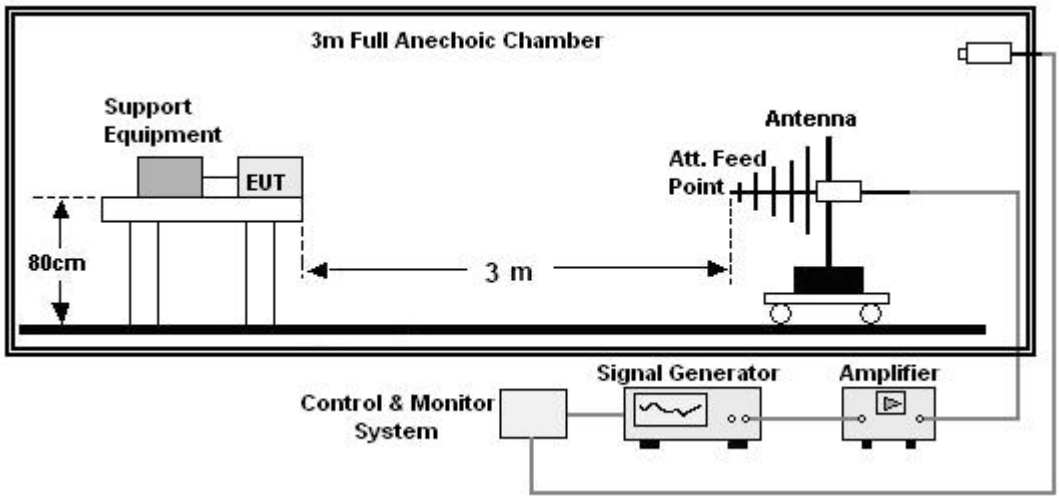
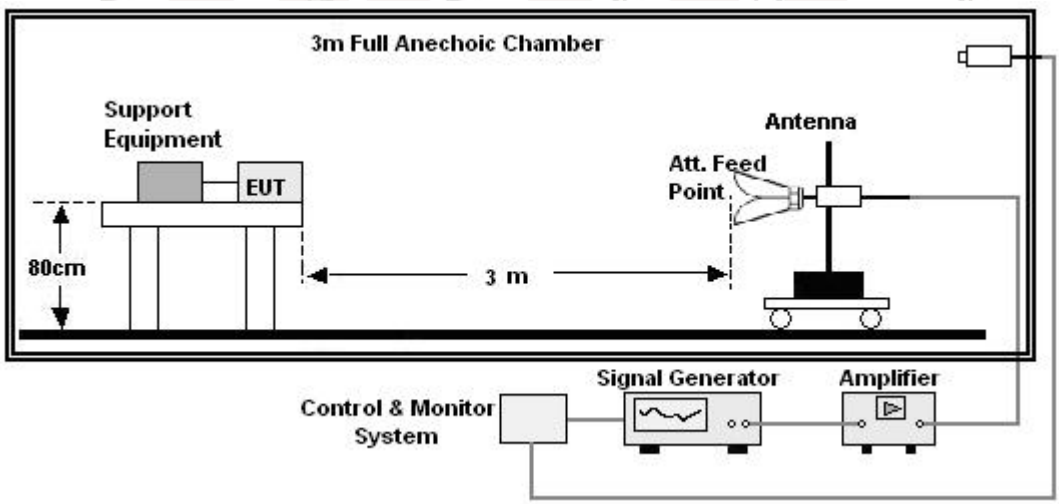
8.2 RADIO FREQUENCY ELECTROMAGNETIC FIELDS

8.2.1 Block Diagram of Test Setup

80-1000MHz:



Above 1GHz



8.2.2 Test Specification

Basic Standard	:	IEC 61000-4-3:2020
Test Port	:	Enclosure port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second
Polarization	:	Horizontal & Vertical

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8.2.3 Test Procedure

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

b. The frequency range is swept from 80MHz to 1000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1%.

c. The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.

8.2.4 Test Results

Radio frequency electromagnetic fields	
Basic Standard:	IEC 61000-4-3:2020
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 230V/50Hz
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa

Frequency (MHz)	Position	Field Strength (V/m)	Performance criterion	Results
80 - 1000	Front, Right, Back, Left	3	A	Pass
1800 2600 3500 5000	Front, Right, Back, Left	3	A	Pass

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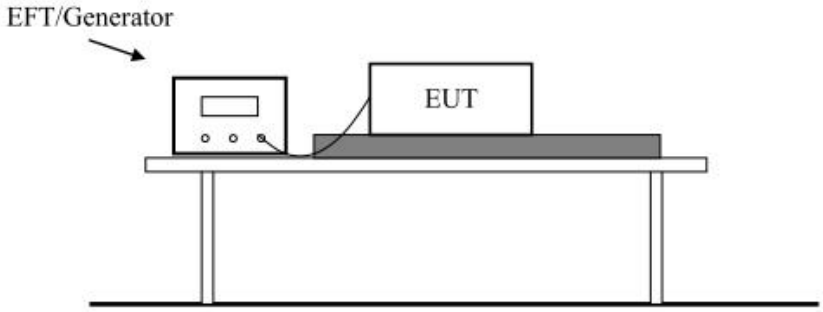
8.3 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

8.3.1 Block Diagram of Test Setup



8.3.2 Test Specification

Basic Standard	:	IEC 61000-4-4:2012
Test Port	:	input a.c. power port
Impulse Frequency	:	5 kHz
Impulse Wave-shape	:	5/50 ns
Burst Duration	:	15 ms
Burst Period	:	300 ms
Test Duration	:	2 minutes per polarity

8.3.3 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall 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 beneath the EUT, shall be more than 0.5m.

8.3.3.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

8.3.3.2. For DC output line ports:

No DC output ports. It’s unnecessary to test.

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8.3.4 Test Results

Electrical Fast Transient/Burst	
Basic Standard:	IEC 61000-4-4:2012
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 230V/50Hz
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa

Line	Test Voltage	Polarity	Performance criterion	Results
L+N	1kv	±	B	Pass

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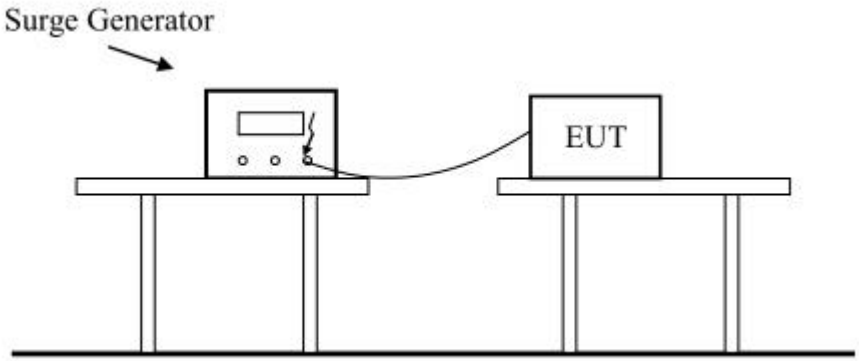
8.4 SURGE IMMUNITY TEST

8.4.1Block Diagram of Test Setup



8.4.2 Test Specification

Basic Standard	IEC 61000-4-5:2014+AMD1:2017
Test Port	input a.c. power port
Wave-Shape	Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	1 pulse / min.
Test Events	Line to earth: Five positive polarity pulses at the 90° phase angel Five negative polarity pulses at the 270° phase angle Neutral to earth: Five negative polarity pulses at the 90° phase angel Five positive polarity pulses at the 270° phase angle

8.4.3 Test Procedure

8.4.3.1. Set up the EUT and test generator as shown on Section 8.4.1.

8.4.3.2. For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

8.4.3.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test

8.4.3.4. Different phase angles are done individually.

8.4.3.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

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8.4.4 Test Results

SURGE IMMUNITY	
Basic Standard:	IEC 61000-4-5:2014+AMD1:2017
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 230V/50Hz
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa

Coupling Line	Voltage (kV)	Phase Angle	Performance criterion	Results
L - N	±1	90° ,270°	B	Pass

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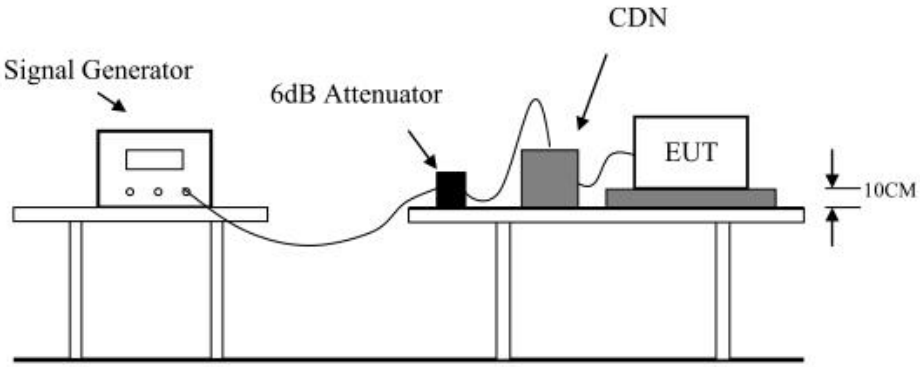
8.5 INJECTED CURRENTS SUSCEPTIBILITY TEST

8.5.1 Block Diagram of Test Setup



8.5.2 Test Specification

Basic Standard	:	IEC 61000-4-6:2013
Test Port	:	input a.c.power port
Step Size	:	1%
Modulation	:	1kHz,80% AM
Dwell Time	:	1 second

8.5.3 Test Procedure

8.5.3.1. Set up the EUT, CDN and test generators as shown on Section 8.5.1.

8.5.3.2. Let the EUT work in test mode and measure it.

8.5.3.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

8.5.3.4. The disturbance signal described below is injected to EUT through CDN.

8.5.3.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.

8.5.3.6. The frequency range is swept from 150kHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

8.5.3.7. The rate of sweep shall not exceed 1.5*10 -3 decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

8.5.3.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

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8.5.4 Test Results

INJECTED CURRENTS SUSCEPTIBILITY	
Basic Standard:	IEC 61000-4-6:2013
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 230V/50Hz
Temperature:	24℃
Humidity:	58%
Atmosphere pressure:	101Kpa

Frequency Range (MHz)	Injected Position	Strength (Non-modulated)	Performance criterion	Results
0.15 ~ 10	AC Mains	3V	A	PASS
10~30	AC Mains	3 to 1 V	A	PASS
30~80	AC Mains	1V	A	PASS

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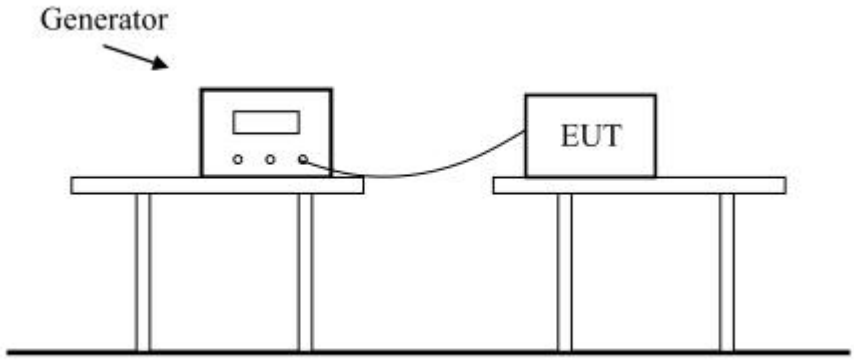
8.6 VOLTAGE DIPS AND INTERRUPTIONS TEST

8.6.1 Block Diagram of Test Setup



8.6.2 Test Specification

Basic Standard	:	IEC 61000-4-11:2020
Test Port	:	input a.c. power port
Phase Angle	:	0°, 180°

8.6.3 Test Procedure

8.6.3.1. Set up the EUT and test generator as shown on Section 8.6.1.

8.6.3.2. The interruptions is introduced at selected phase angles with specified duration.

8.6.3.3. Record any degradation of performance.

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8.6.4 Test Results

VOLTAGE DIPS AND INTERRUPTIONS	
Basic Standard:	IEC 61000-4-11:2020
EUT:	IP-PBX
M/N:	UC200
Test Mode	Connected to the notebook
Test Voltage:	AC 120V/60Hz & AC 230V/50Hz
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa

AC 120V				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles) 60Hz	Performance criterion	Results
0	100	0.5	B	Pass
70	30	30	C	Pass
0	100	300	C	Pass

AC 230V				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles) 50Hz	Performance criterion	Results
0	100	0.5	B	Pass
70	30	25	C	Pass
0	100	250	C	Pass

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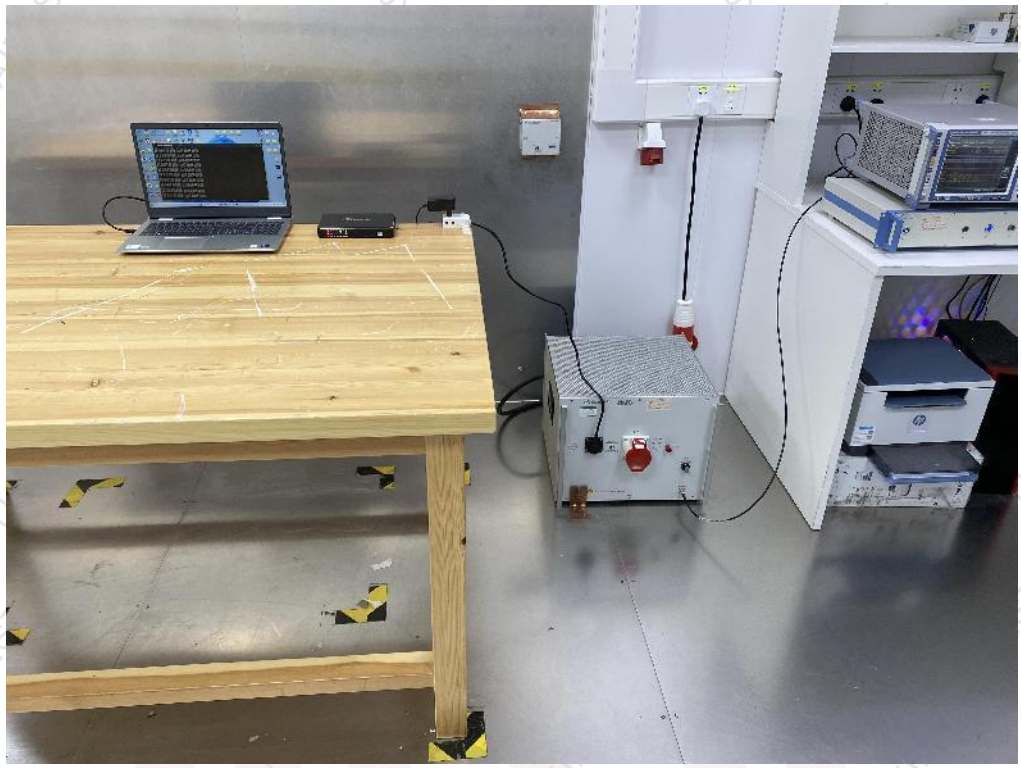
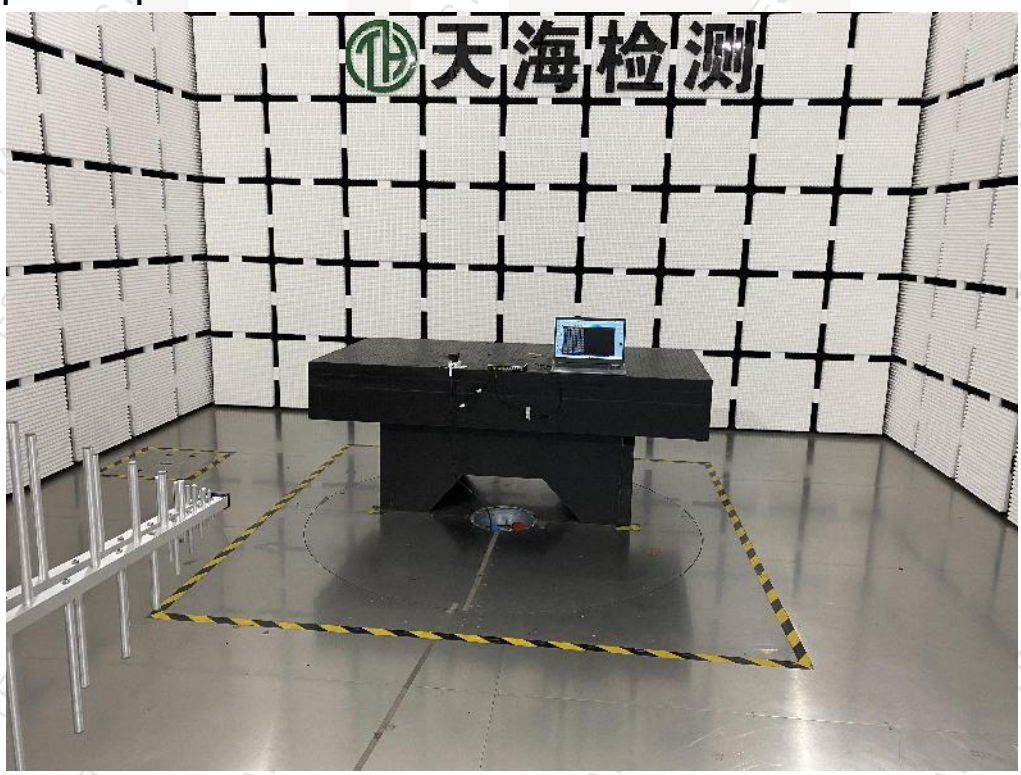
APPENDIX A - TEST SETUP PHOTOGRAPHS

Photograph 1:Setup for Conducted Emission



Photograph 2:Setup for Radiated Emission



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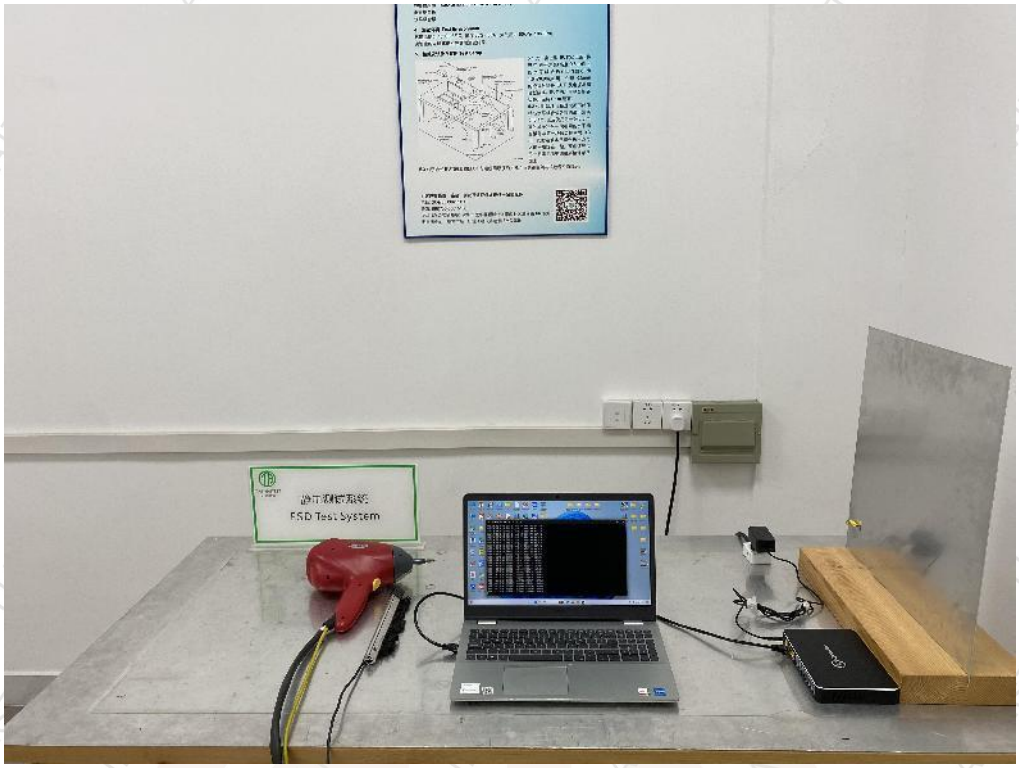
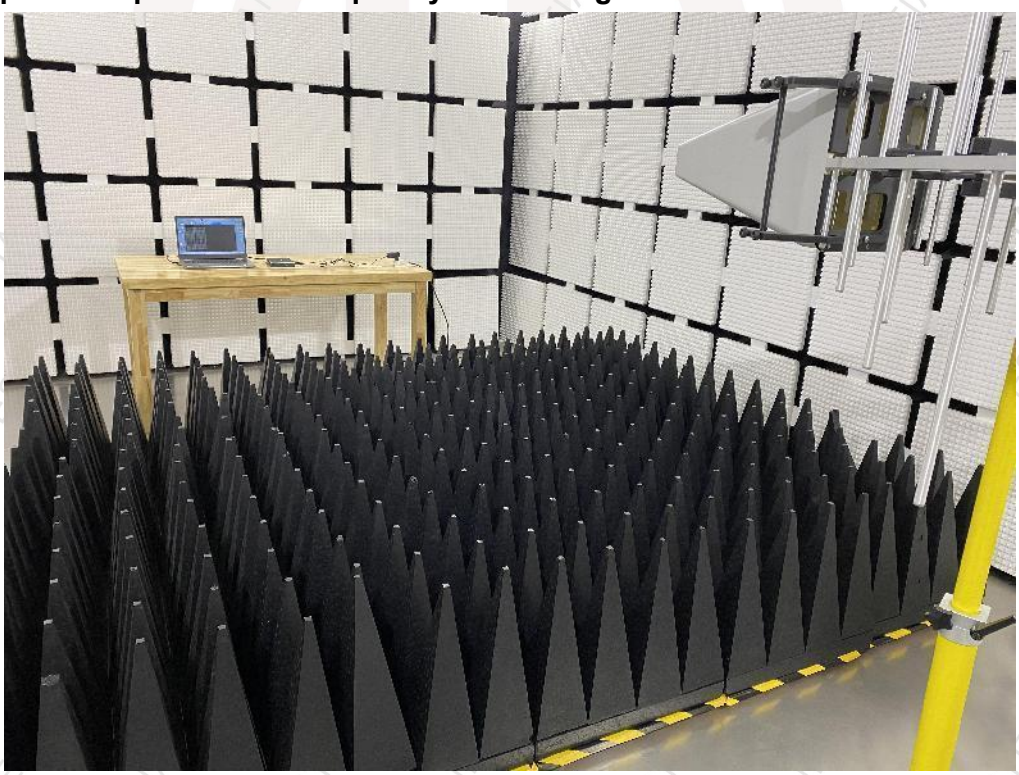
Photograph 3:Setup for Electrostatic Discharge



Photograph 4:Setup for Radio Frequency Electromagnetic Fields



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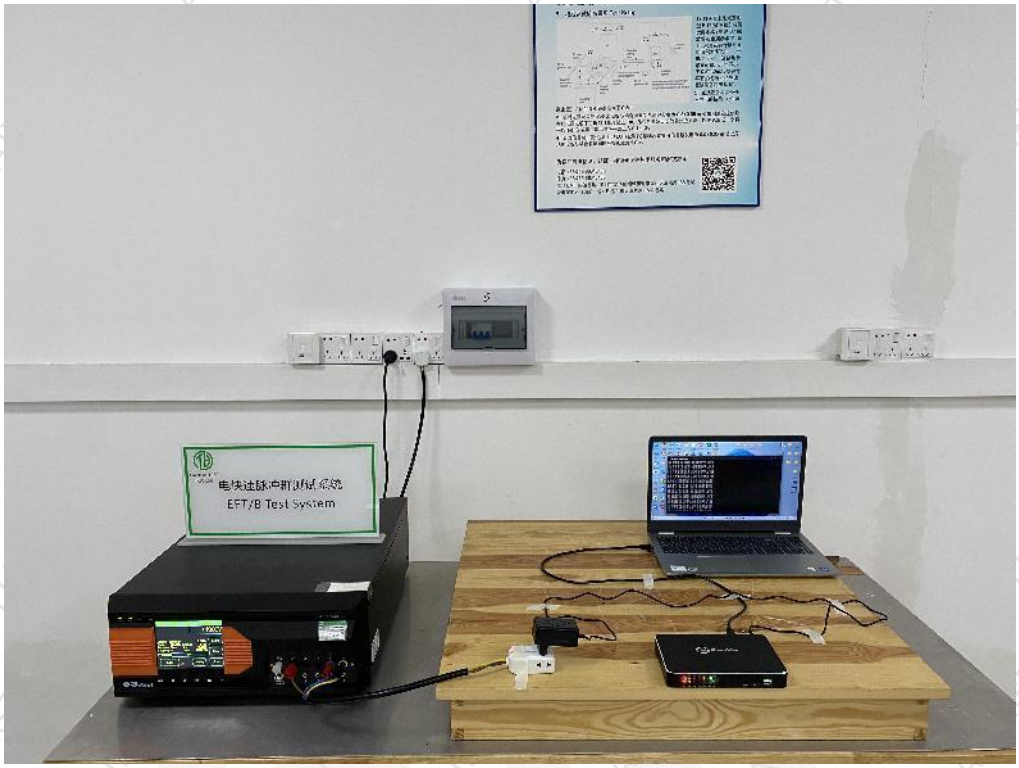
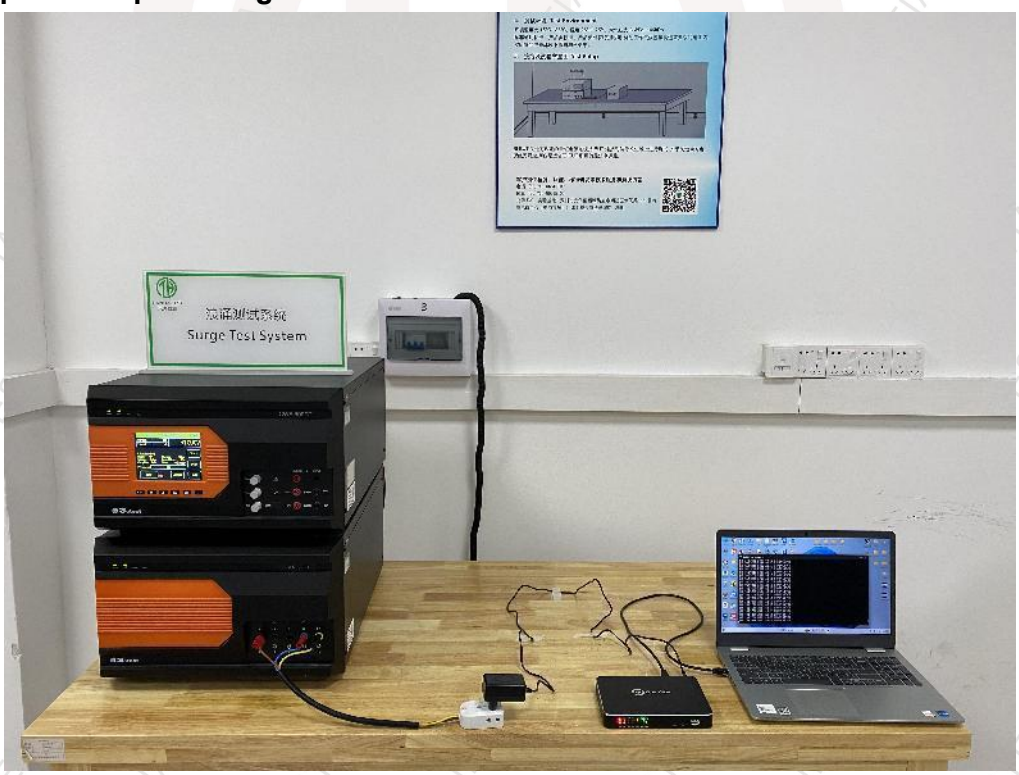
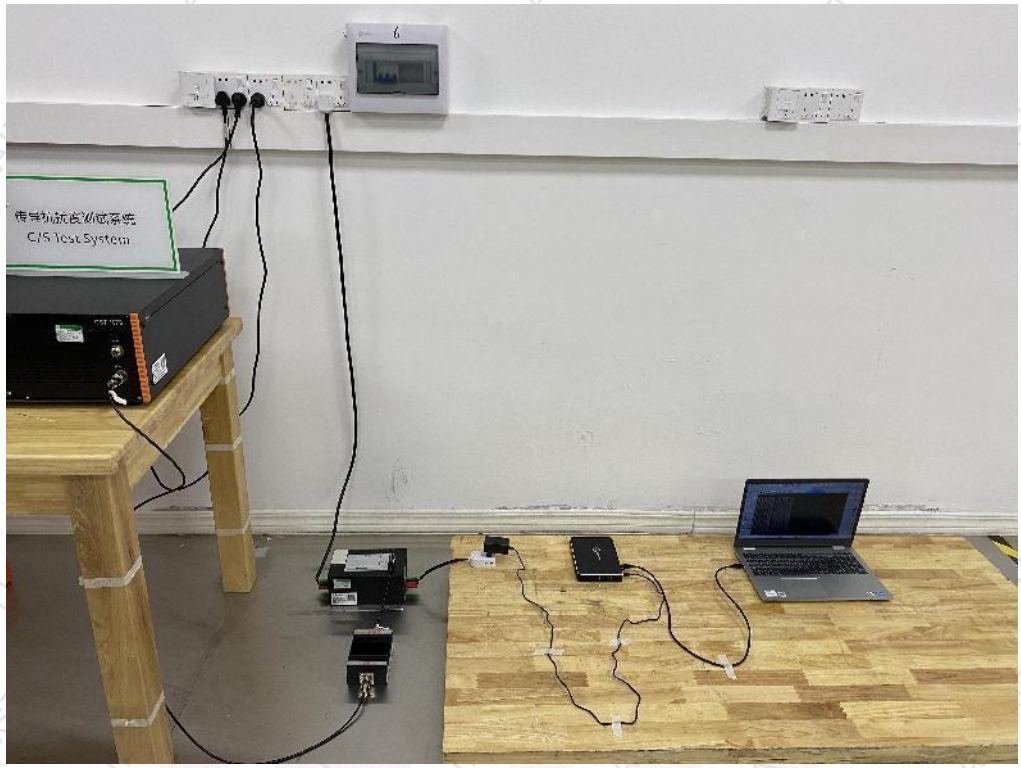
Photograph 5:Setup for Electrical Fast Transient/Burst



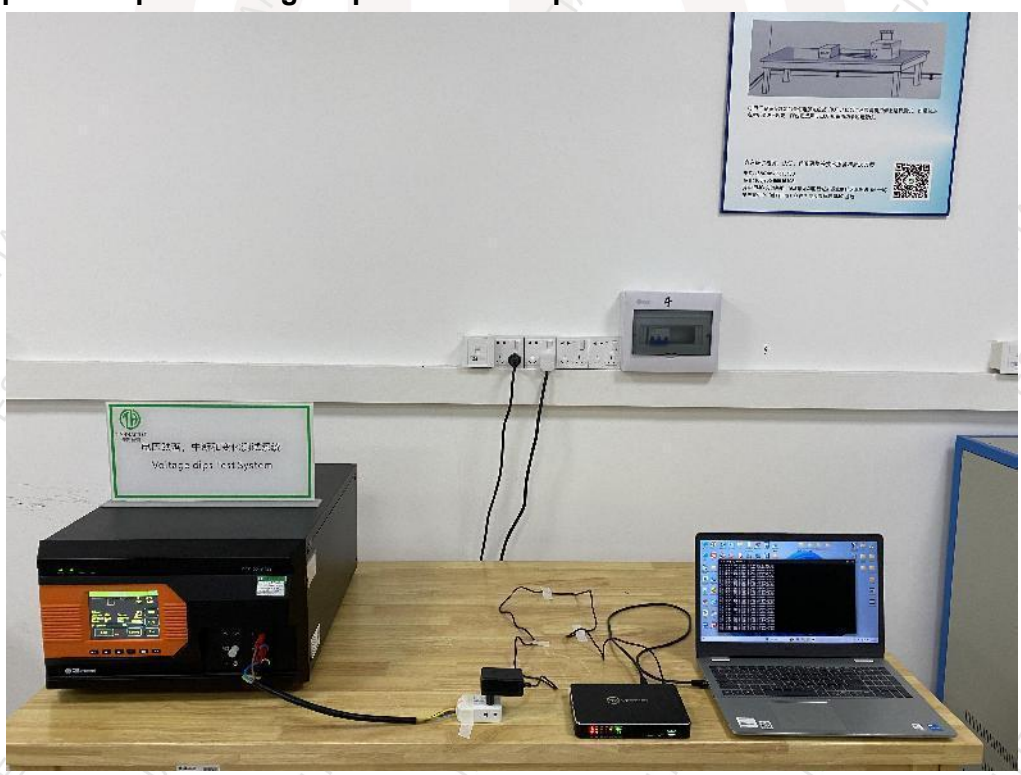
Photograph 6:Setup for Surge



Photograph 7:Setup for Injected Currents Susceptibility



Photograph 8:Setup for Voltage Dips And Interruptions



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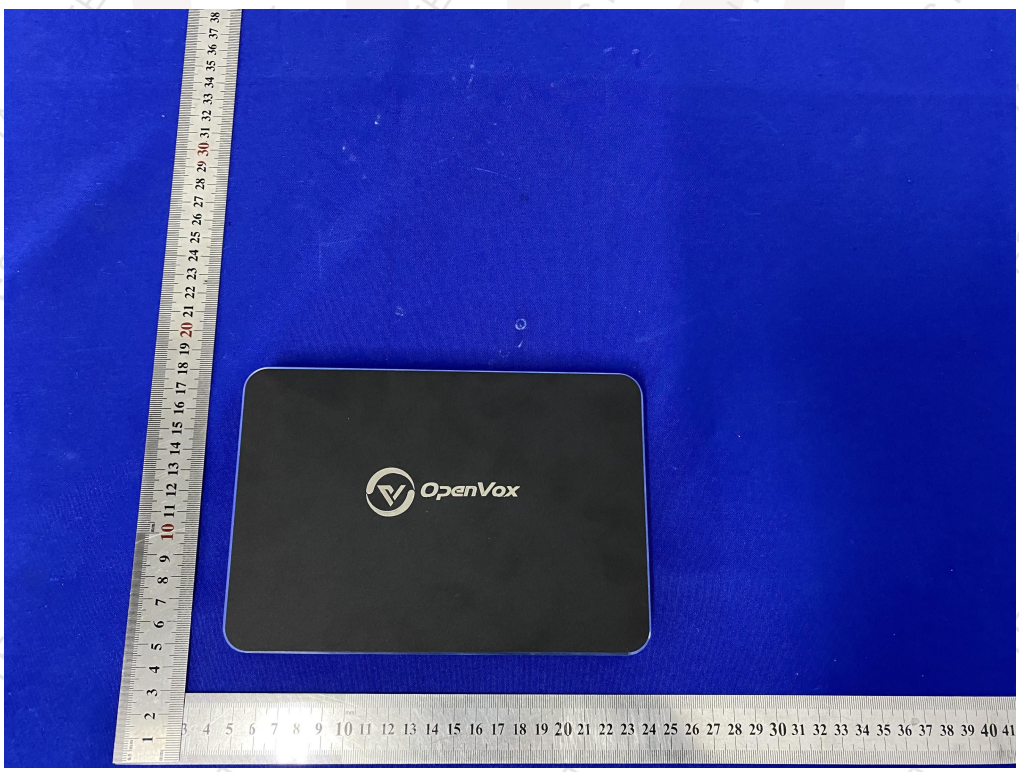
APPENDIX B - EUT PHOTOGRAPHS



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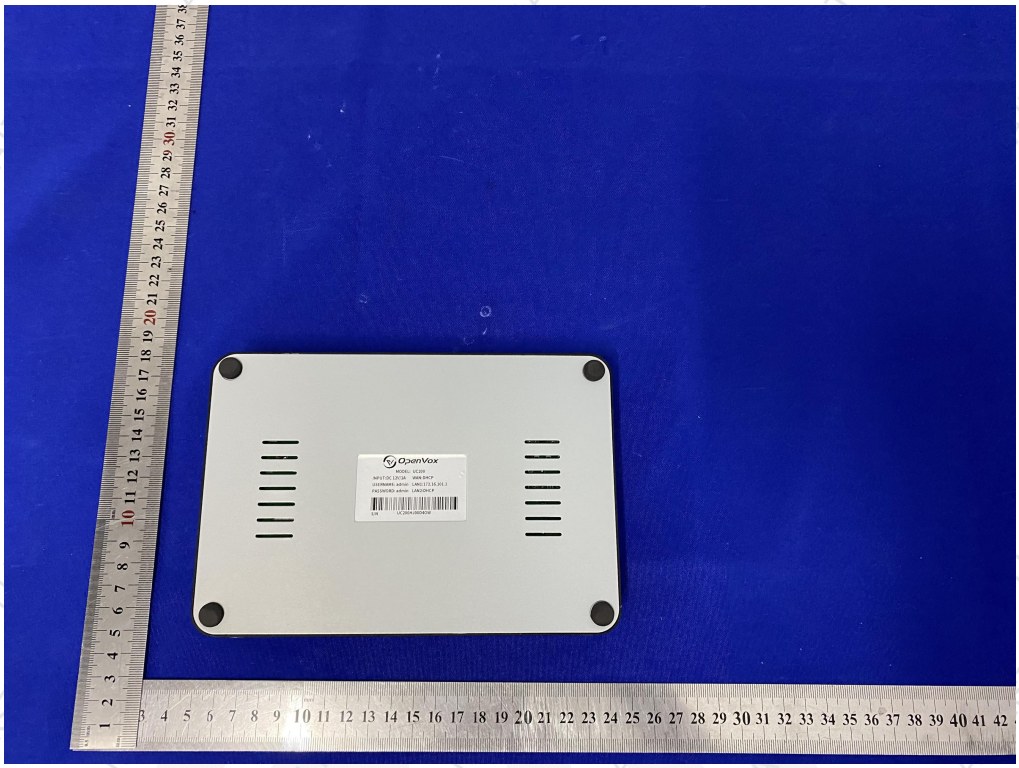

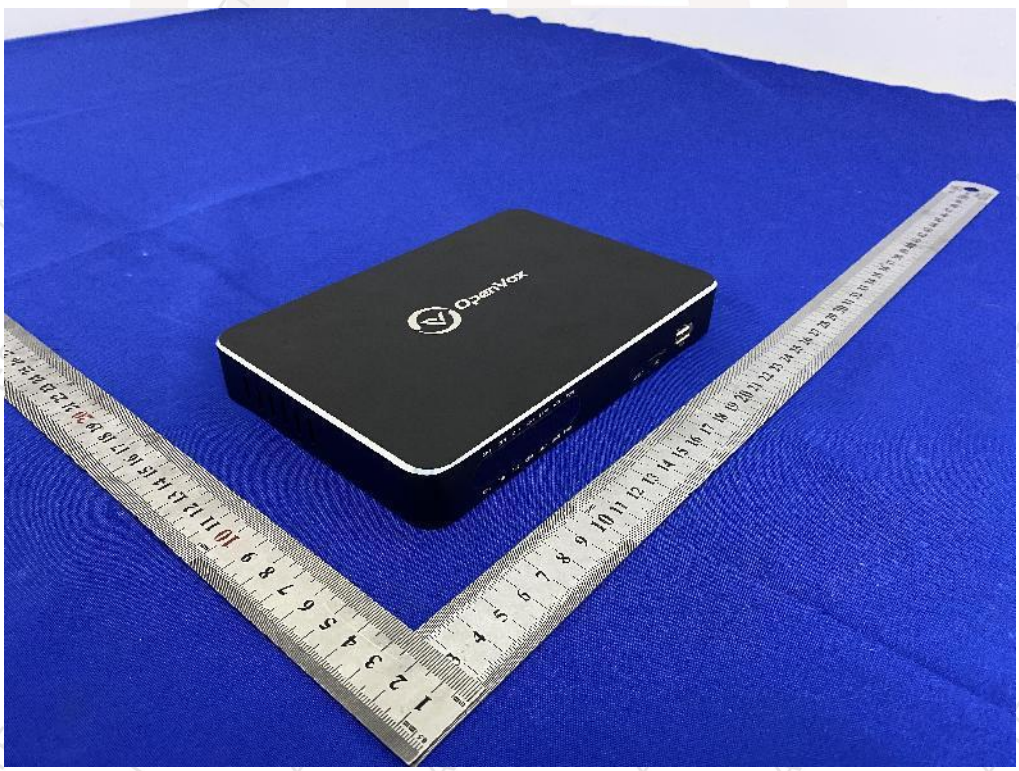

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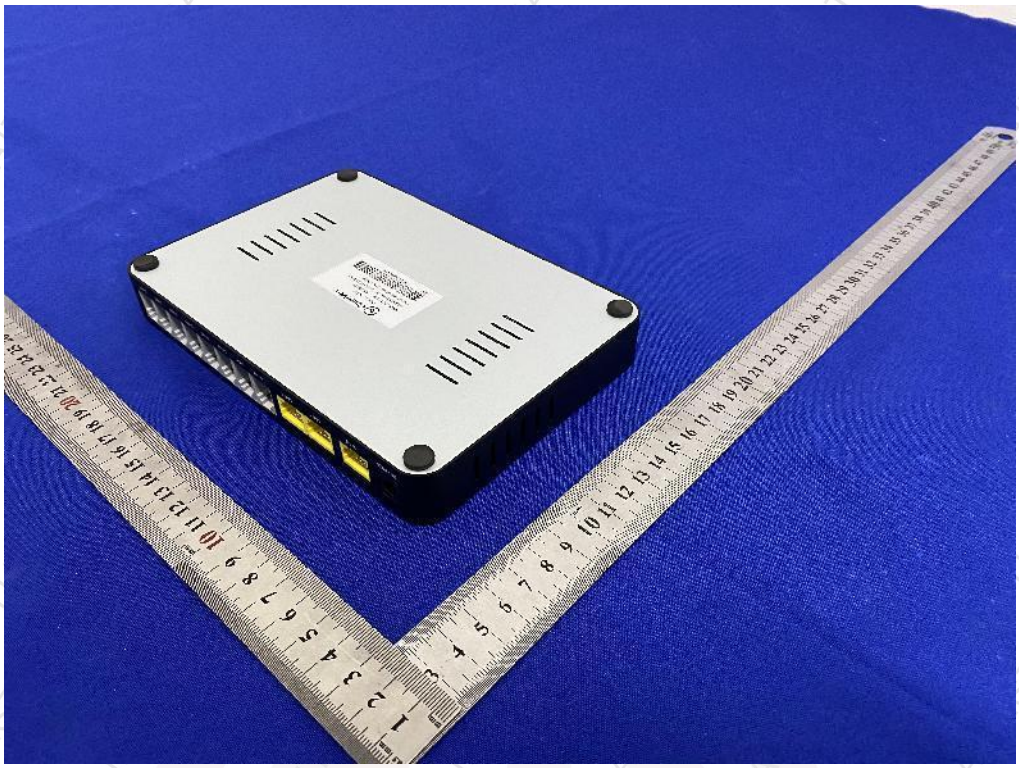

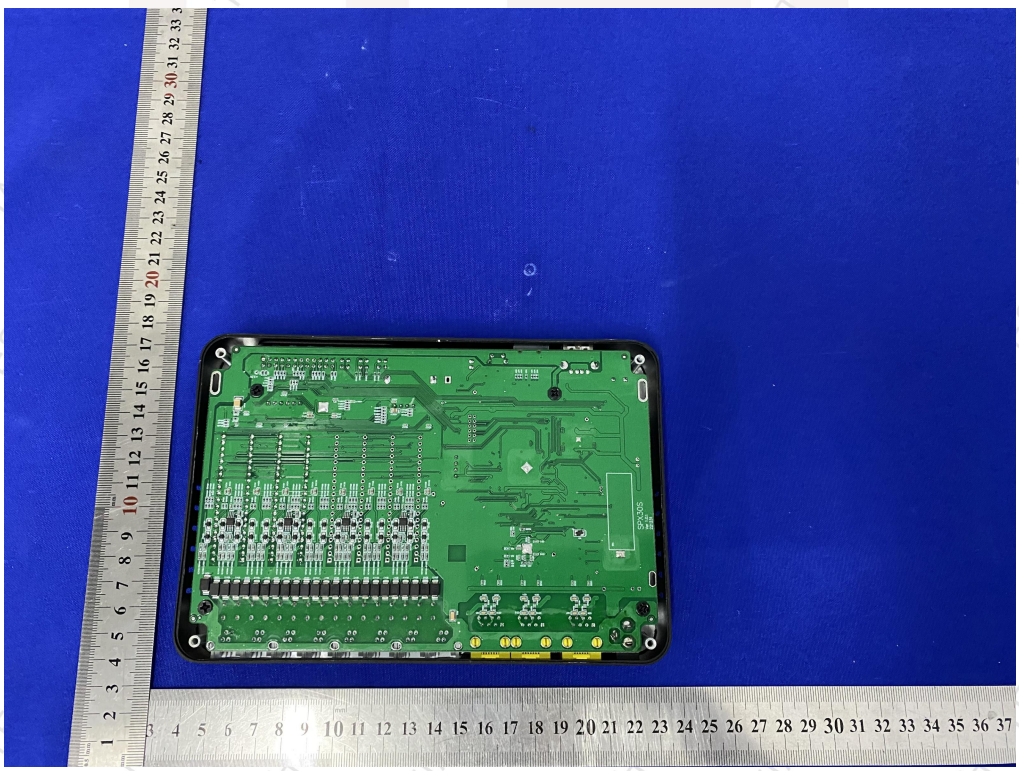

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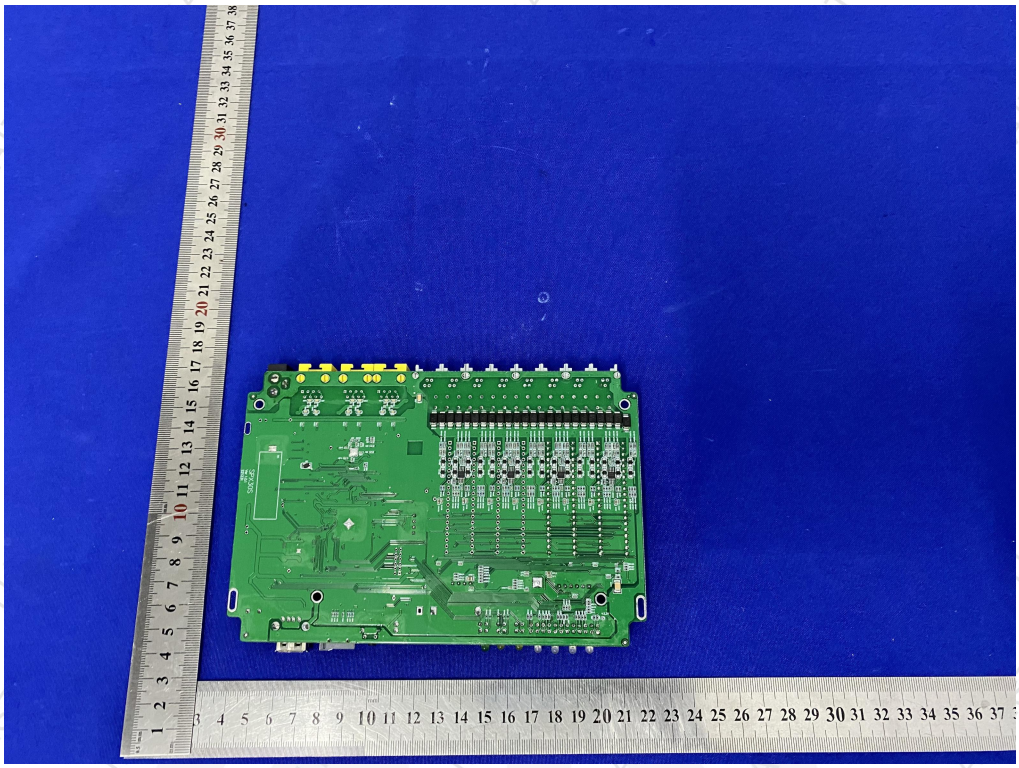

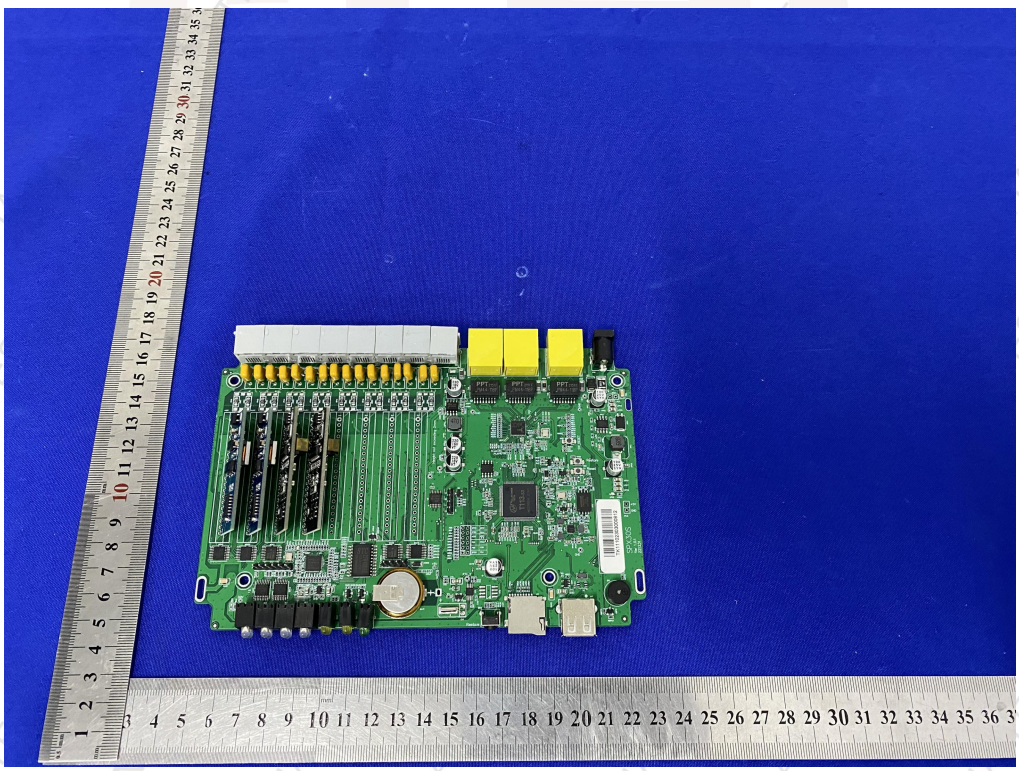

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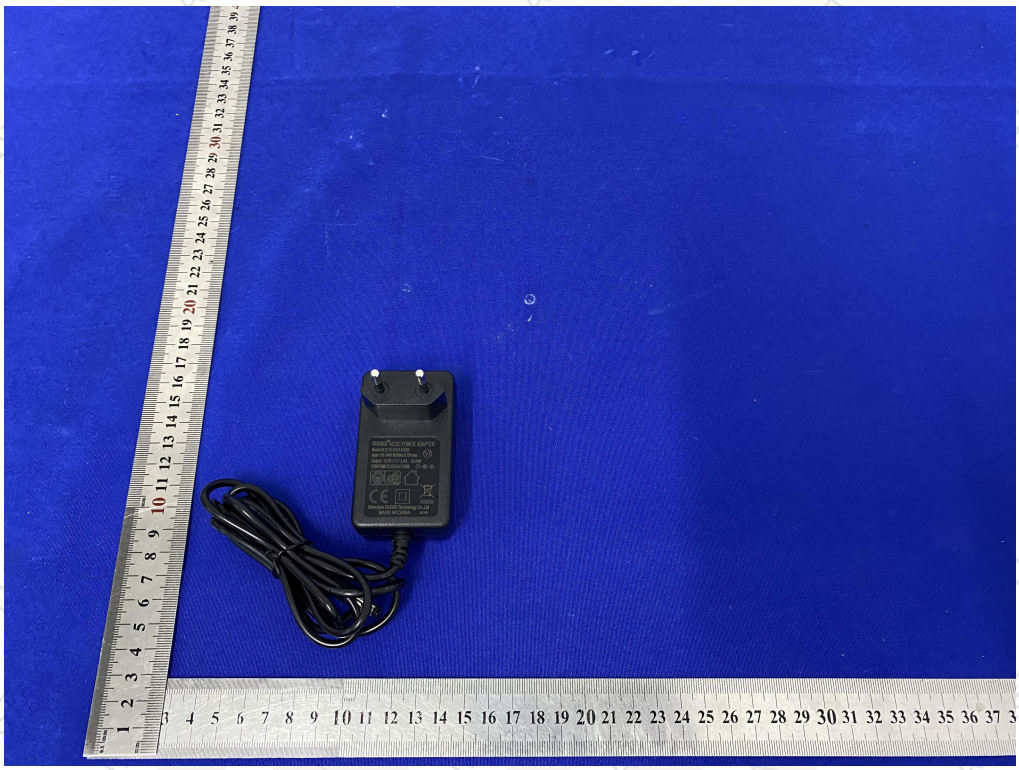


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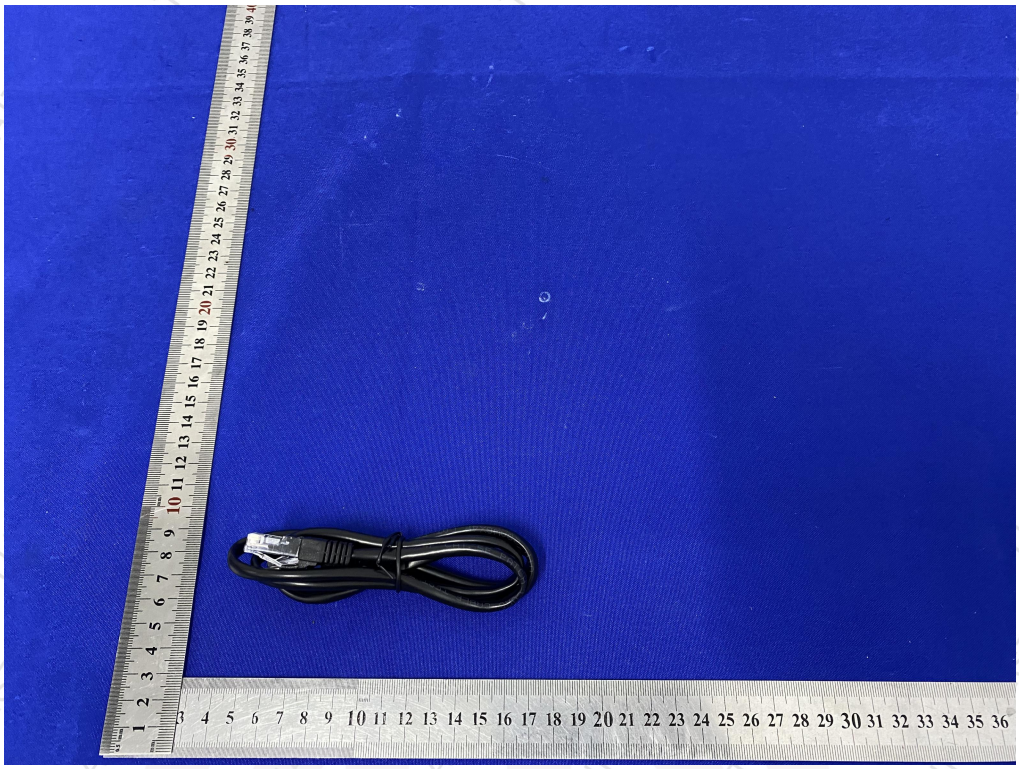

END OF THE REPORT

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