EMC TEST REPORT

EN 55032:2015+A1:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021
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:MAG1100

2024-03-12

This Report Concerns:	**Equipment Type:**
Original Report	Analog Gateway

Test Engineer:	Leon Gao/ Leon Gao
Report Number:	TH2403055-C01-R01
Test Date:	2024-03-06 to 2024-03-12
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 +A1:2020	EN 55032:2015 +A1:2020	See Section 4	PASS
Asymmetric mode conducted emission	EN 55032:2015 +A1:2020	EN 55032:2015 +A1:2020	See Section 5	PASS
Radiated disturbance	EN 55032:2015 +A1:2020	EN 55032:2015 +A1:2020	See Section 6	PASS
Harmonic current emissions	EN IEC 61000-3-2 :2019+A1:2021	EN IEC 61000-3-2 :2019+A1:2021	See Section 7	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013 +A1:2019+A2:2021	EN 61000-3-3:2013 +A1:2019+A2:2021	See Section 8	PASS
IMMUNITY				
Description of Test Item	**Test Standard**	**Basic Standard**	**Test configuration**	**Results**
Electrostatic discharge (ESD)	EN 55035:2017 +A11:2020	IEC 61000-4-2:2008	See Section 9.1	PASS
Radio-frequency, Continuous radiated disturbance	EN 55035:2017 +A11:2020	IEC 61000-4-3:2020	See Section 9.2	PASS
Electrical fast transient (EFT)	EN 55035:2017 +A11:2020	IEC 61000-4-4:2012	See Section 9.3	PASS
Surge (Input a.c. power ports)	EN 55035:2017 +A11:2020	IEC 61000-4-5:2014 +AMD1:2017	See Section 9.4	PASS
Radio-frequency, Continuous conducted disturbance	EN 55035:2017 +A11:2020	IEC 61000-4-6:2013	See Section 9.5	PASS
Power frequency magnetic field*	/	/	See Note	N/A
Voltage dips and interruptions	EN 55035:2017 +A11:2020	IEC 61000-4-11:2020	See Section 9.6	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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Internal Source	Upper Frequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6GHz, whichever is less

1.2 DESCRIPTION OF PERFORMANCE CRITERIA

General Performance Criteria

General performance criteria are defined in 1.2.1, 1.2.2 and 1.2.3. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.
When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

1.2.1 Performance criterion 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.

1.2.2 Performance criterion 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.

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 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.

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2 - GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST

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:	Analog Gateway
Trade Mark:	OpenVox
Model No.:	MAG1100
Sample No.:	TH2403055
Ratings:	Input: AC 100-240V, 50/60Hz, 1.5A ,120W
Test Mode:	Normal Working
Note:	/

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 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty” and is documented in the LCS quality system acc. To DIN EN ISO/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	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	±2.52 dB ±2.36 dB	±3.80 dB ±3.40 dB
Power disturbance	Level accuracy (30MHz to 300MHz)	±3.20 dB	±4.50 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	±3.10dB	N/A
Radiated emission	Level accuracy (30MHz to 1000MHz)	±5.78dB	±6.30dB

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	Level accuracy (above 1000MHz)	±4.62dB	N/A
Mains Harmonic	Voltage	±1.80%	N/A
Voltage Fluctuations & Flicker	Voltage	±0.64%	N/A

(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 & 9.
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	Type	S/N
Notebook	DELL	Inspiron 3501	/

The EUT was tested with following cables:

Cable name	Length (m)	Shield	Core No.	Detachable
LAN cable	1.8m	No	0	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	2024-11-13
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2024-11-13
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2024-11-13
Pulse Limiter	Schwarzbeck	VTSD 9561-F	847	2024-11-13
Test software	EZ	EMC-CON 3A1.1	/	/
Disturbance power				
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
EMI Absorbing Clamp	Teseq	MDS 21B	58115	2024-11-20
Test software	EZ	EMC-CON 3A1.1	/	/
LLAS Radiated Disturbance (2m)				
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
Loop Antenna	Schwarzbeck	HXYZ 9170	353	2024-11-13
Test software	EZ	EMC-CON 3A1.1	/	/
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2024-04-20
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2024-11-20
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2024-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2024-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5372	20210331001	2024-11-13
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2024-11-13
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2024-11-20
Test software	FALA	/	FA-03A2 RE	/
Harmonics & Flicker				
5kVA AC Power Source	AMETEK CTS	5001iX-CTS-400	2046A03237	2024-11-13
Signal Conditioning Unit	AMETEK CTS	PACS-1	2046A03238	2024-11-13
Test software	AMETEK CTS	CTS 4	Version 4.26.0	/
Electrostatic discharge (ESD)				
ESD Simulator	TESEQ	NSG 437	1569	2024-11-15

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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	2024-11-13
Coupling Clamp	3C TEST	CCC 100	CCC 20092269	2024-11-13
CCS	3C TEST	V4.2.7	ES027000120015	/
Surge				
Surge simulator	3C TEST	CWS 600CT	ES058000920005	2024-11-13
Three phases CDN	3C TEST	SPN 3832T	ES0911910	2024-11-13
CDN for unshielded symmetrical high-speed Telecom cable	3C TEST	CDN405T8A	ES064001220010	2024-11-13
CDN for Telecom cable	3C TEST	CDN405M40-5	ES1071910	2024-11-13
CWS	3C TEST	V1.0.5.2	ES058000920005	/
Radio-frequency,Continuous conducted disturbance (CS)				
Conducted Immunity Test System	3C TEST	CST 1075	ES096000120008	2024-11-13
6dB Attenuator	3C TEST	DTC75-6	ES095000120006	2024-11-13
Single phase CDN	3C TEST	CDN M2M3	ES064002620007	2024-11-13
Three phases CDN	3C TEST	CDN M5-16	ES064003320004	2024-11-13
Calibration Set	3C TEST	CDN 100KIT	ES064002820016	2024-11-13
Calibration Set	3C TEST	EM CL100KIT	EM C20032816	2024-11-13
EM-Clamp	3C TEST	EM CL100	EM C20032811	2024-11-13

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EMC-s	SKET	V1.4.0.54	/	/
Power Frequency Magnetic Field (PFMF)				
PFMF simulator	3C TEST	MFS 400	ES045000720001	2024-11-13
Transformer	3C TEST	MFT 400	ES046000220003	2024-11-13
Magnetic field antenna	3C TEST	TCXS111	TCXS20060910	2024-11-13
CWS	3C TEST	V4.2.7	ES045000720001	/
Voltage dips &Voltage interruptions				
Power failure simulator	3C TEST	PFS 2216SD	ES049001220003	2024-11-13
CCS	3C TEST	V4.2.8	ES049001220003	/

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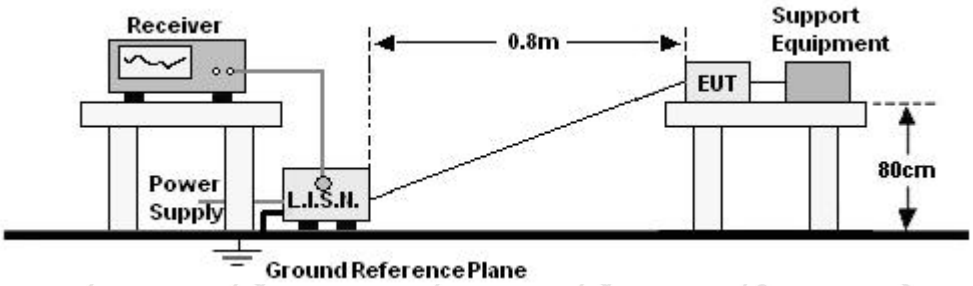
4 - CONDUCTED EMISSION MEASUREMENT

4.1 BLOCK DIAGRAM OF TEST SETUP



4.2 LIMITS

Frequency range (MHz)	Class B Limits (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 - 56	56 - 46
0.50 ~ 5	56	46
5 ~ 30	60	50

Remark: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.
(3) All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

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 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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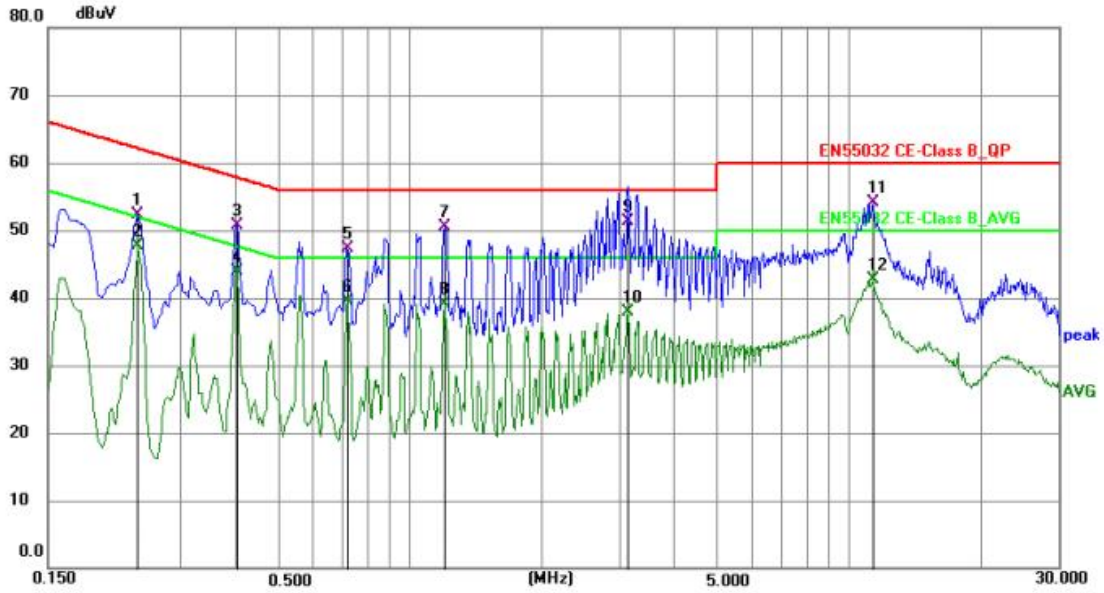
4.4 TEST RESULTS AND DATA

EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage :	AC 230V/50Hz
Temperature:	23℃
Humidity:	55%
Atmosphere pressure:	101Kpa
Test Results:	Pass

Phase:L1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2400	41.69	10.59	52.28	62.10	-9.82	QP	P
2	0.2400	37.18	10.59	47.77	52.10	-4.33	AVG	P
3	0.4020	40.07	10.60	50.67	57.81	-7.14	QP	P
4 *	0.4020	33.38	10.60	43.98	47.81	-3.83	AVG	P
5	0.7170	36.68	10.64	47.32	56.00	-8.68	QP	P
6	0.7215	28.82	10.64	39.46	46.00	-6.54	AVG	P
7	1.1985	39.89	10.66	50.55	56.00	-5.45	QP	P
8	1.1985	28.41	10.66	39.07	46.00	-6.93	AVG	P
9	3.1560	40.70	10.70	51.40	56.00	-4.60	QP	P
10	3.1560	27.20	10.70	37.90	46.00	-8.10	AVG	P
11	11.3320	43.27	10.79	54.06	60.00	-5.94	QP	P
12	11.3320	31.86	10.79	42.65	50.00	-7.35	AVG	P

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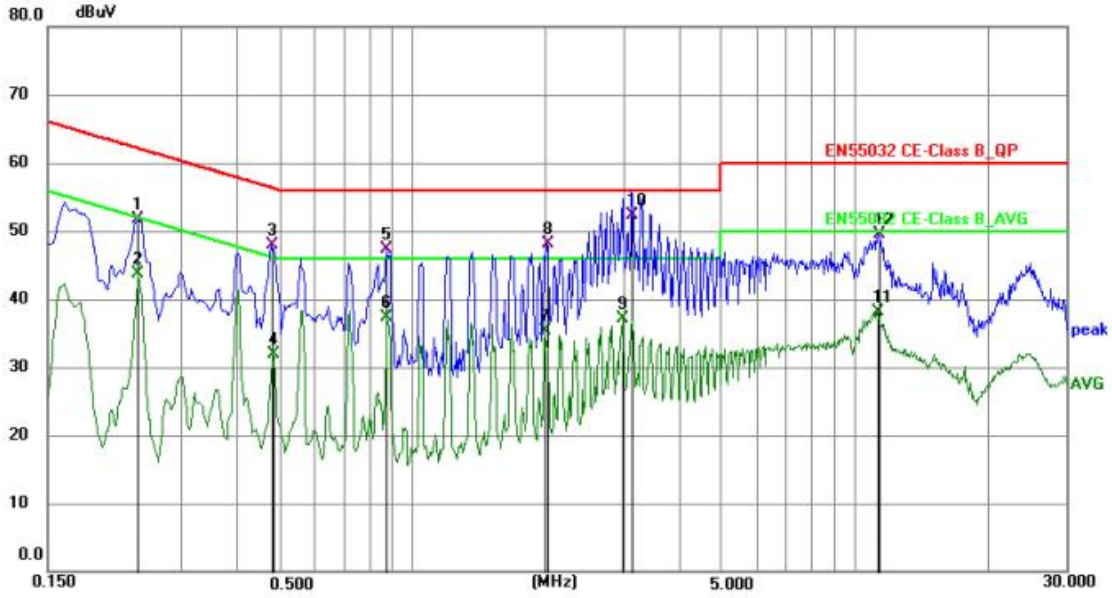
Phase:N



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2400	41.17	10.59	51.76	62.10	-10.34	QP	P
2	0.2400	33.10	10.59	43.69	52.10	-8.41	AVG	P
3	0.4785	37.28	10.62	47.90	56.37	-8.47	QP	P
4	0.4830	21.31	10.62	31.93	46.29	-14.36	AVG	P
5	0.8745	36.68	10.65	47.33	56.00	-8.67	QP	P
6	0.8790	26.75	10.65	37.40	46.00	-8.60	AVG	P
7	1.9950	24.59	10.68	35.27	46.00	-10.73	AVG	P
8	2.0220	37.47	10.68	48.15	56.00	-7.85	QP	P
9	2.9940	26.33	10.69	37.02	46.00	-8.98	AVG	P
10 *	3.1380	41.60	10.70	52.30	56.00	-3.70	QP	P
11	11.2060	27.18	10.85	38.03	50.00	-11.97	AVG	P
12	11.3050	38.65	10.86	49.51	60.00	-10.49	QP	P

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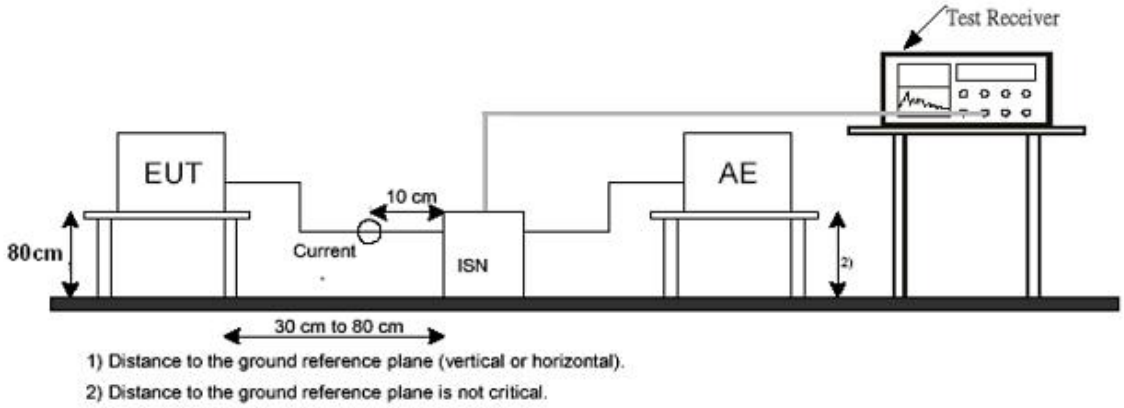
5 - ASYMMETRIC MODE CONDUCTED EMISSION MEASUREMENT

5.1 BLOCK DIAGRAM OF TEST SETUP



5.2 LIMITS

Frequency range (MHz)	Class B Limits (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	84-74	74-64
0.50 ~ 30	74	64

Remark: * means decreasing linearly with logarithm of frequency.
The lower limit shall apply at the transition frequencies.

5.3 TEST PROCEDURE

The EUT is put on the plane 0.8m high above the ground by insulating support and selecting ISN for unscreened cable or a current probe for screened cable to take measurement.
The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition.
Making a overall range scan by using the test receiver controlled by controller and record at least six highest emissions for showing in the test report.

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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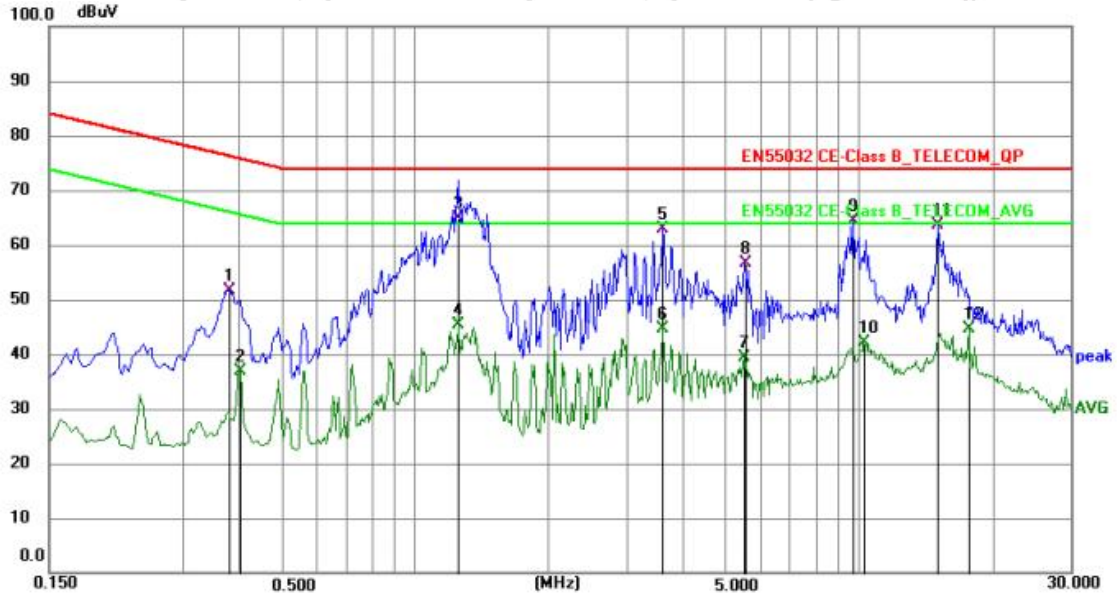
5.4 TEST RESULTS AND DATA

EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage :	AC 230V/50Hz
Temperature:	23℃
Humidity:	55%
Atmosphere pressure:	101Kpa
Test Results:	Pass



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.3795	31.52	20.21	51.73	76.29	-24.56	QP	P
2	0.4020	16.79	20.19	36.98	65.81	-28.83	AVG	P
3 *	1.2615	44.88	20.02	64.90	74.00	-9.10	QP	P
4	1.2615	25.25	20.02	45.27	64.00	-18.73	AVG	P
5	3.6150	43.04	19.93	62.97	74.00	-11.03	QP	P
6	3.6150	24.70	19.93	44.63	64.00	-19.37	AVG	P
7	5.5130	19.47	19.91	39.38	64.00	-24.62	AVG	P
8	5.5580	36.81	19.91	56.72	74.00	-17.28	QP	P
9	9.7520	44.50	19.92	64.42	74.00	-9.58	QP	P
10	10.2745	22.27	19.92	42.19	64.00	-21.81	AVG	P
11	15.1255	43.58	19.95	63.53	74.00	-10.47	QP	P
12	17.6950	24.53	20.01	44.54	64.00	-19.46	AVG	P

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6 - RADIATED DISTURBANCE MEASUREMENT

6.1 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz

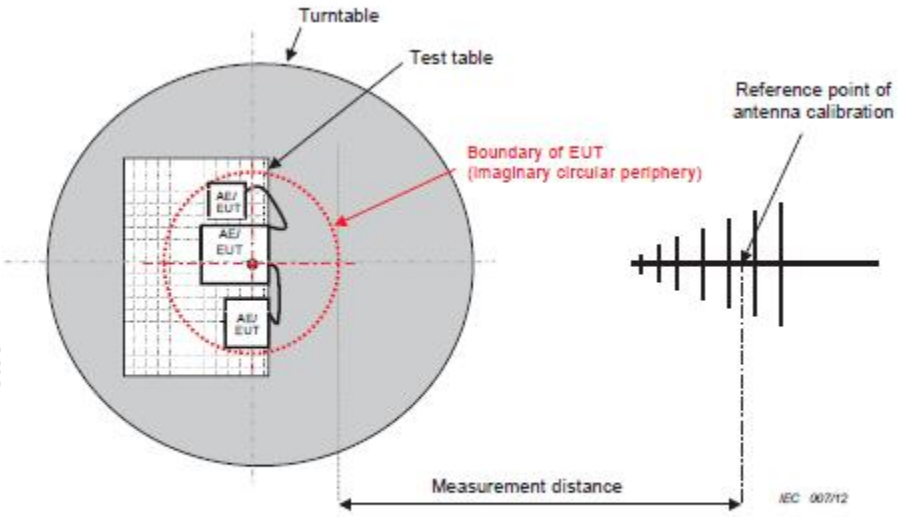

Figure C.1 – Measurement distance

Above 1GHz

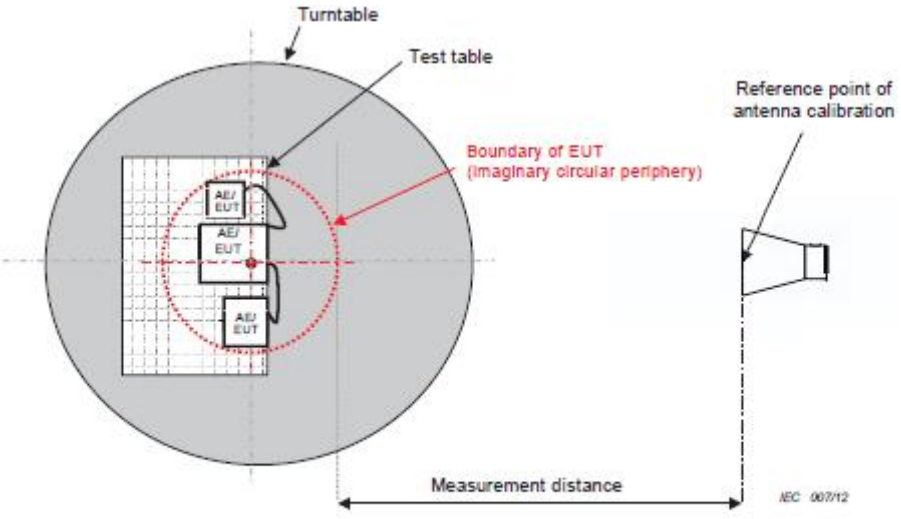

Figure C.1 – Measurement distance

6.2 LIMITS

Below 1GHz

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

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

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Above 1GHz

Frequency (MHz)	Class B Limits at 3m	
	Peak dB(μV/m)	Average
1000-3000	70	50
3000-6000	74	54

6.3 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(Below 1GHz), 1MHz RBW(Above 1GHz). 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 or peak 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 / peak / AVG, and specified bandwidth with Maximum Hold Mode, and record the maximum value.

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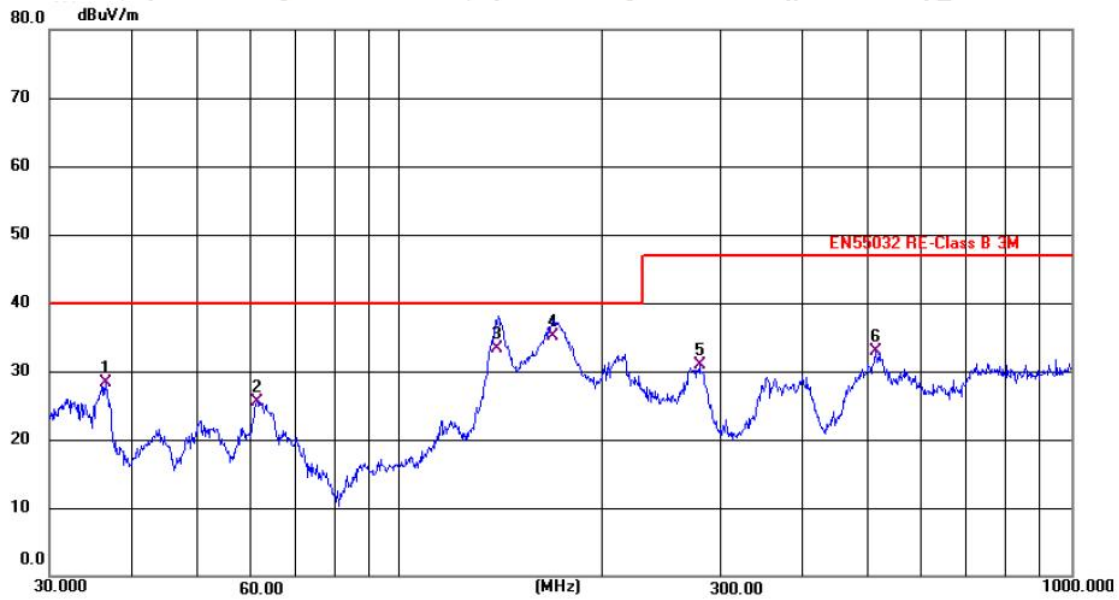
6.4 TEST RESULTS AND DATA

EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage :	AC 230V/50Hz
Temperature:	26℃
Humidity:	54%
Atmosphere pressure:	101Kpa
Test Results:	Pass

Below 1GHz
Polarization:Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.5092	43.46	-15.23	28.23	40.00	-11.77	QP
2	61.3463	41.34	-15.83	25.51	40.00	-14.49	QP
3	140.0961	48.91	-15.61	33.30	40.00	-6.70	QP
4 *	168.4138	51.58	-16.38	35.20	40.00	-4.80	QP
5	279.5333	45.67	-14.77	30.90	47.00	-16.10	QP
6	510.9386	42.13	-9.16	32.97	47.00	-14.03	QP

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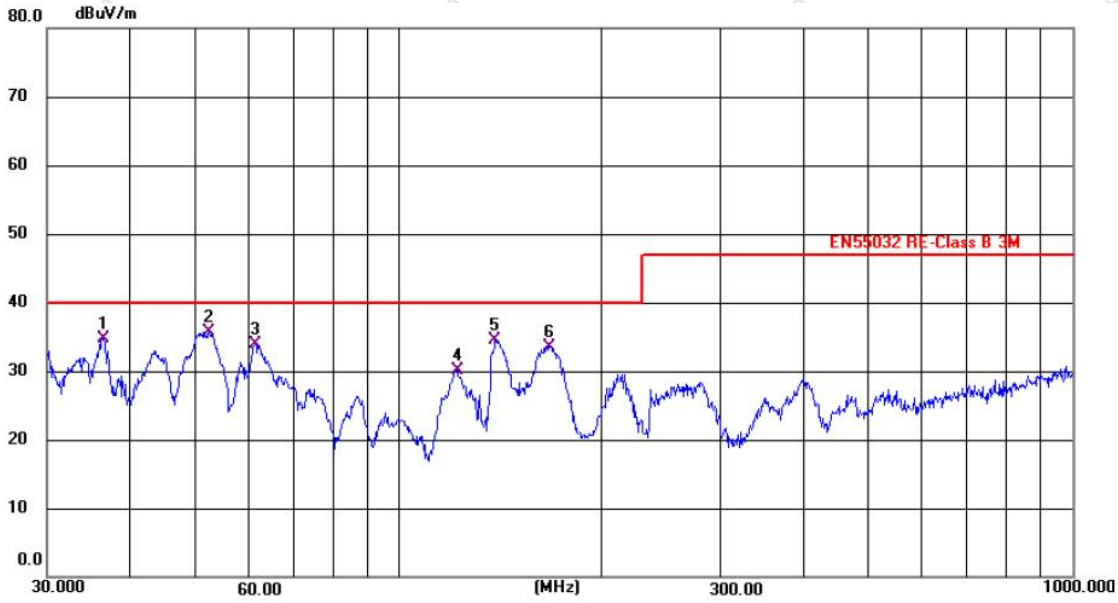
Polarization:Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.4451	49.91	-15.20	34.71	40.00	-5.29	QP
2 *	52.2077	51.19	-15.41	35.78	40.00	-4.22	QP
3	61.3462	50.28	-16.40	33.88	40.00	-6.12	QP
4	121.9754	47.12	-16.92	30.20	40.00	-9.80	QP
5	139.3611	50.34	-15.75	34.59	40.00	-5.41	QP
6	167.5302	49.53	-16.00	33.53	40.00	-6.47	QP

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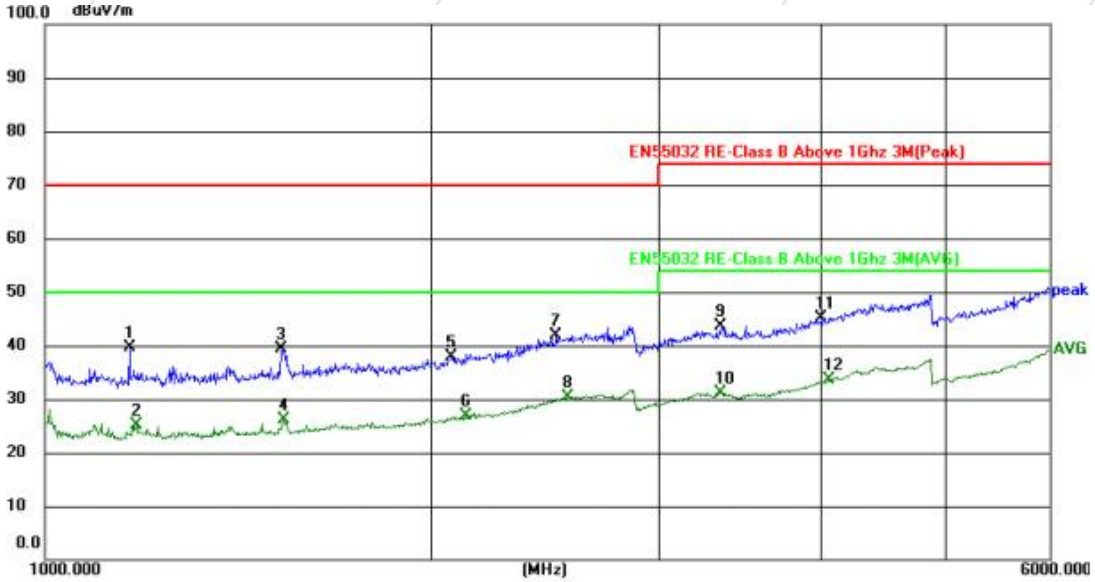
Above 1GHz
Polarization:Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1164.509	44.95	-5.35	39.60	70.00	-30.40	peak
2	1179.207	30.47	-5.32	25.15	50.00	-24.85	AVG
3	1527.681	43.58	-4.25	39.33	70.00	-30.67	peak
4	1533.166	30.46	-4.23	26.23	50.00	-23.77	AVG
5	2071.660	40.40	-2.64	37.76	70.00	-32.24	peak
6	2122.382	29.50	-2.50	27.00	50.00	-23.00	AVG
7	2493.774	43.26	-1.42	41.84	70.00	-28.16	peak
8 *	2550.257	31.71	-1.22	30.49	50.00	-19.51	AVG
9	3351.599	43.42	0.24	43.66	74.00	-30.34	peak
10	3351.599	30.99	0.24	31.23	54.00	-22.77	AVG
11	4005.697	41.58	3.53	45.11	74.00	-28.89	peak
12	4059.890	30.00	3.62	33.62	54.00	-20.38	AVG

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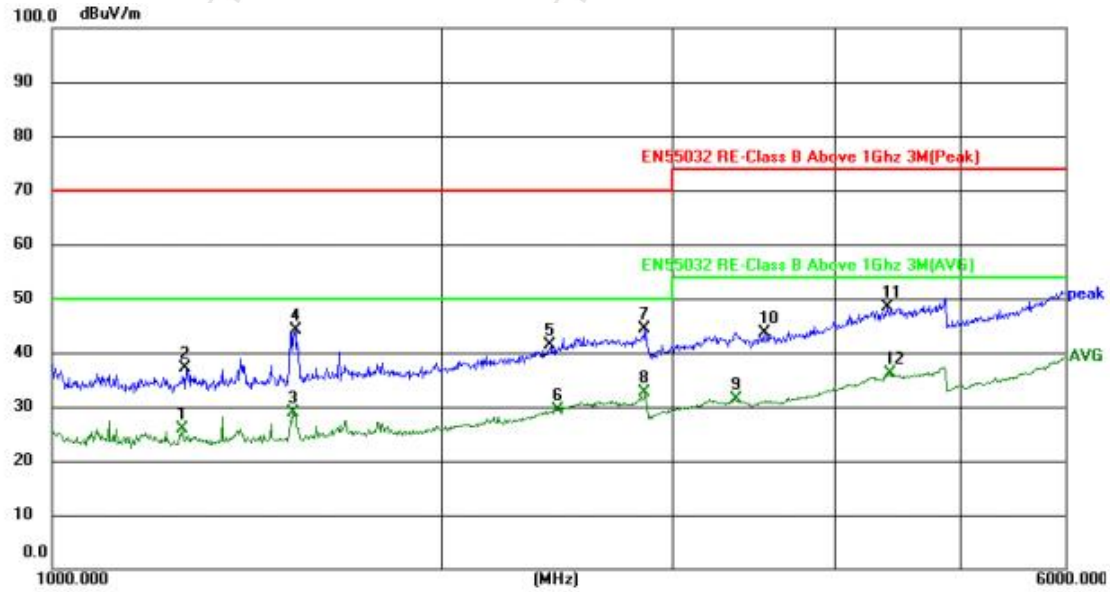
Polarization:Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1260.032	30.84	-5.07	25.77	50.00	-24.23	AVG
2	1270.232	42.13	-5.03	37.10	70.00	-32.90	peak
3	1531.793	33.18	-4.24	28.94	50.00	-21.06	AVG
4	1540.049	48.38	-4.21	44.17	70.00	-25.83	peak
5	2416.793	43.08	-1.65	41.43	70.00	-28.57	peak
6	2451.685	31.02	-1.54	29.48	50.00	-20.52	AVG
7	2855.009	44.43	-0.15	44.28	70.00	-25.72	peak
8 *	2855.009	32.66	-0.15	32.51	50.00	-17.49	AVG
9	3363.631	31.16	0.24	31.40	54.00	-22.60	AVG
10	3530.356	43.22	0.39	43.61	74.00	-30.39	peak
11	4388.983	44.16	4.20	48.36	74.00	-25.64	peak
12	4404.739	31.87	4.23	36.10	54.00	-17.90	AVG

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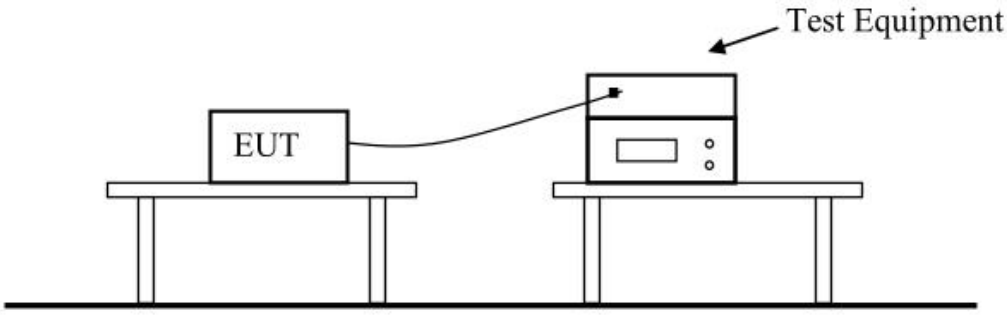
7 - HARMONIC CURRENT EMISSION MEASUREMENT

7.1 BLOCK DIAGRAM OF TEST SETUP



7.2 TEST STANDARD

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

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 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.

7.4 TEST RESULTS

PASS

Because power of EUT's rated power is 37W and less than 75W, According standard EN IEC 61000-3-2:2019+A1:2021, the result no judgment.

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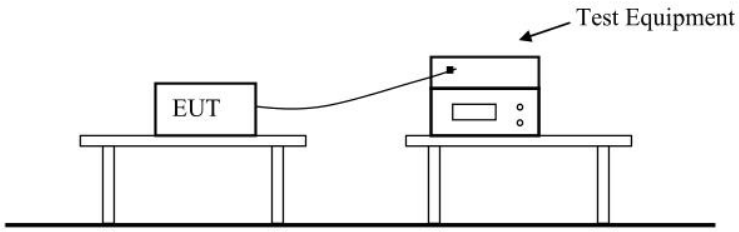
8 - VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

8.1 BLOCK DIAGRAM OF TEST SETUP



8.2 TEST STANDARD

Please refer to EN 61000-3-3:2013+A1:2019+A2:2021

8.3 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.

8.4 TEST RESULTS

PASS

The active power of the EUT is about 37W only, which unlikely to produce significant voltage fluctuation. Therefore no test was applied.

See “EN 61000-3-3:2013+A1:2019+A2:2021, clause 6.1” Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker....”.

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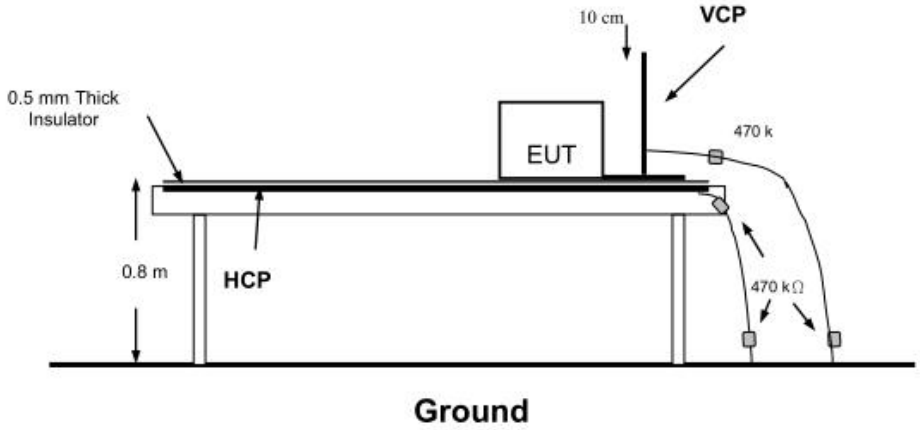
9 - IMMUNITY TEST

9.1 ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1.1 BLOCK DIAGRAM OF TEST SETUP



9.1.2 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

9.1.3 TEST PROCEDURE

9.1.3.1. 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.

9.1.3.2. Contact Discharge

All the procedure shall be same as Section 9.1.3.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.1.3.3. 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.

9.1.3.4. 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.

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9.1.4 TEST RESULTS

Electrostatic Discharge	
Basic Standard:	IEC 61000-4-2:2008
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Performance criteria	Result
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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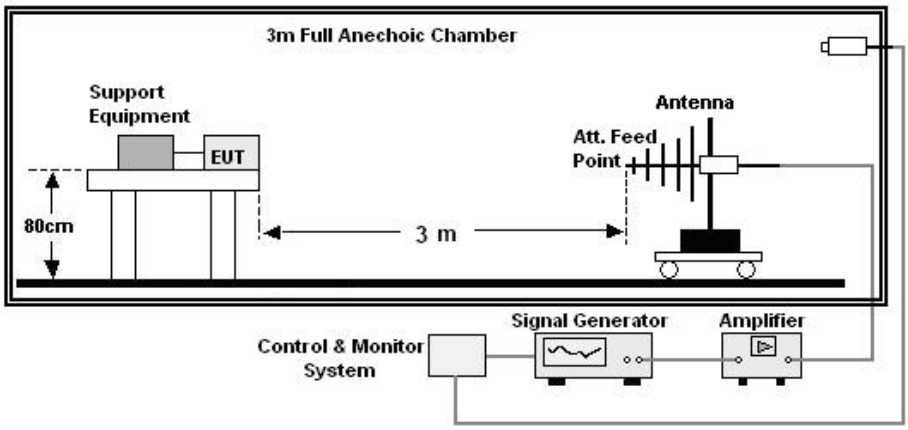
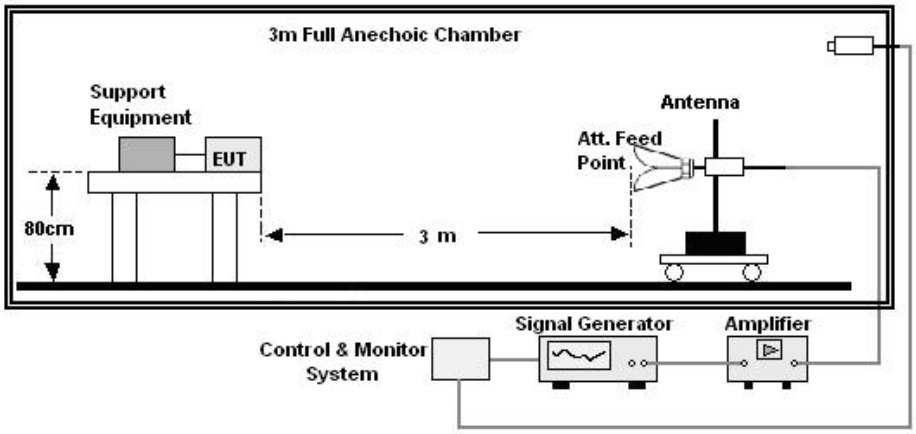
9.2 RADIO FREQUENCY ELECTROMAGNETIC FIELDS

9.2.1 BLOCK DIAGRAM OF TEST SETUP

80-1000MHz:



1000-6000MHz:



9.2.2 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

9.2.3 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, 1800MHz, 2600MHz, 3500MHz, 5000MHz, 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.

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9.2.4 TEST RESULTS

Radio frequency electromagnetic fields	
Basic Standard:	IEC 61000-4-3:2020
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

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

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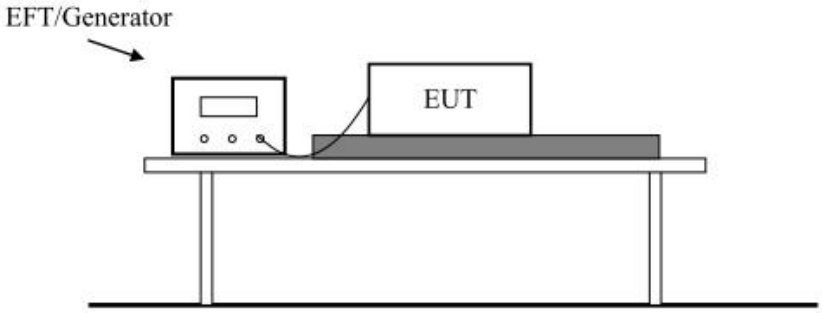
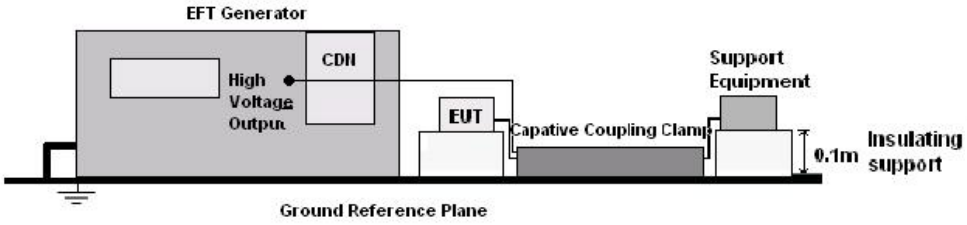
9.3 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

9.3.1 BLOCK DIAGRAM OF TEST SETUP



AC power port



Signal port

9.3.2 TEST SPECIFICATION

Basic Standard	:	IEC 61000-4-4:2012
Test Port	:	input a.c.power port / signal 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

9.3.3 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.

9.3.3.1. For input and output AC power ports:

The EUT is connected to the AC power 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.

9.3.3.2. For signal lines and control lines ports:

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

No I/O ports. It's unnecessary to test.

9.3.3.3. For DC output line ports:

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

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9.3.4 TEST RESULTS

Electrical Fast Transient/Burst	
Basic Standard:	IEC 61000-4-4:2012
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

Line	Test Voltage	Performance criteria	Result
L	±1kV	B	Pass
N	±1kV	B	Pass
L-N	±1kV	B	Pass
PE	±1kV	B	Pass
L-PE	±1kV	B	Pass
N-PE	±1kV	B	Pass
L-N-PE	±1kV	B	Pass
LAN	±0.5kV	B	Pass

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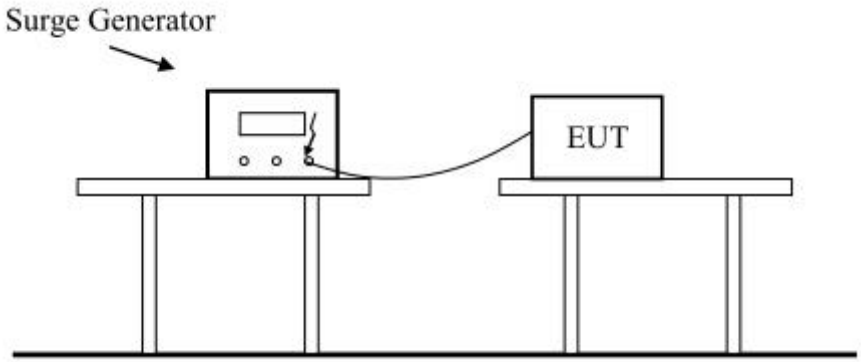
9.4 SURGE IMMUNITY TEST

9.4.1 BLOCK DIAGRAM OF TEST SETUP



9.4.2 TEST SPECIFICATION

Basic Standard	IEC 61000-4-5:2014+AMD1:2017
Test Port	input a.c. power port /signal port
Wave-Shape	Open Circuit Voltage - 1.2 / 50 us, 10/700us Short Circuit Current - 8 / 20 us, 5/320us
Pulse Repetition Rate	1 pulse / min.
Test Events	Five positive polarity pulses at the 90° phase angel Five negative polarity pulses at the 270° phase angel

9.4.3 TEST PROCEDURE

9.4.1.1. Set up the EUT and test generator as shown on Section 9.4.1.

9.4.1.2. 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.

9.4.1.3. For Lan port to ground coupling mode, provide a 0.5 KV 10/700us voltage surge (at open-circuit condition) and 5/320us current surge to EUT selected points.

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

9.4.1.5. Different phase angles are done individually.

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

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9.4.4 TEST RESULTS

SURGE IMMUNITY	
Basic Standard:	IEC 61000-4-5:2014+AMD1:2017
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

Line	Phase Angle	Test Voltage	Number of Pulse	Performance criteria	Result
L-N	90°	+ 1kV	5	B	Pass
	270°	- 1kV	5	B	Pass
L-PE	90°	+ 2kV	5	B	Pass
	270°	- 2kV	5	B	Pass
N-PE	90°	- 2kV	5	B	Pass
	270°	+ 2kV	5	B	Pass
LAN	/	±0.5kV	5	B	Pass

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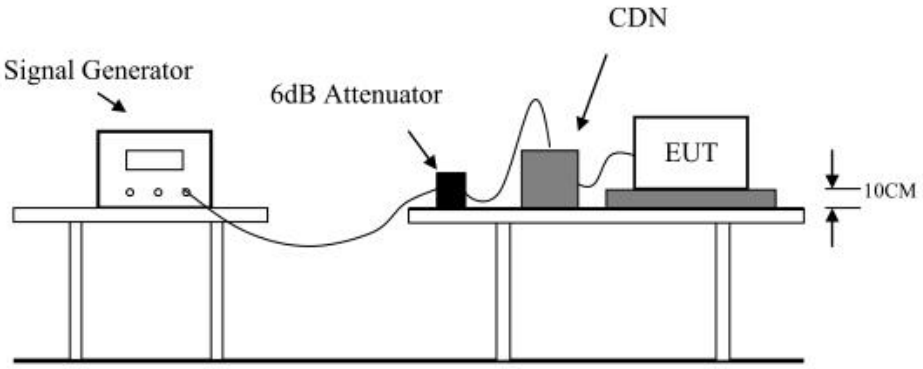
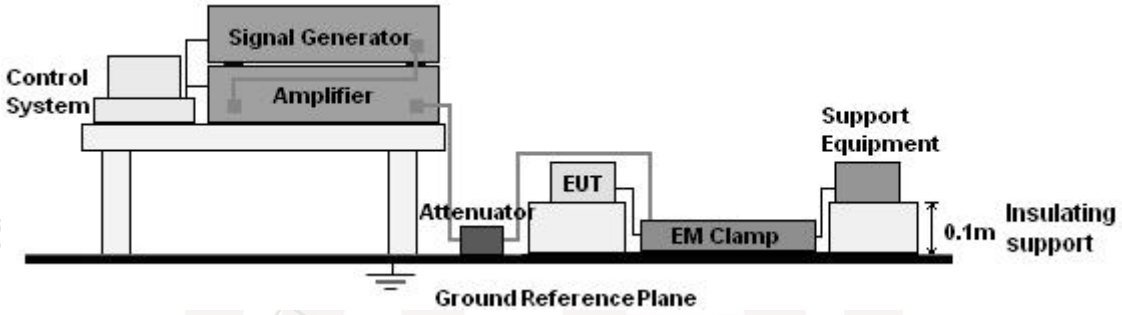
9.5 INJECTED CURRENTS SUSCEPTIBILITY TEST

9.5.1 BLOCK DIAGRAM OF TEST SETUP



AC power port



Signal port

9.5.2 TEST SPECIFICATION

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

9.5.3 TEST PROCEDURE

For a.c. / d.c. power port

9.5.3.1. Set up the EUT, CDN and test generators as shown on Section 9.5.1.

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

9.5.3.3. 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).

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

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

9.5.3.6. The frequency range is swept from 150kHz to 10MHz using 3V, 10MHz to 30MHz using 3V to 1V,30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude

modulated with a 1kHz sine wave.

9.5.3.7. 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.

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

For signal / control lines:

9.5.3.9. The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support, and the telecommunication port under test was connected to support units through the current clamp.

9.5.3.10. The frequency range is swept from 150kHz to 10MHz using 3V, 10MHz to 30MHz using 3V to 1V,30MHz to 80MHz using 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

9.5.3.11. 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.

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

9.5.4 TEST RESULTS

INJECTED CURRENTS SUSCEPTIBILITY	
Basic Standard:	IEC 61000-4-6:2013
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

Frequency Range (MHz)	Injected Position	Strength (Non-modulated)	Performance criteria	Result
0.15 ~ 10	AC Mains	3V r.m.s.	A	Pass
10 ~ 30	AC Mains	3V r.m.s. to 1V r.m.s.	A	Pass
30 ~ 80	AC Mains	1V r.m.s.	A	Pass
0.15 ~ 10	LAN	3V r.m.s.	A	Pass
10 ~ 30	LAN	3V r.m.s. to 1V r.m.s.	A	Pass
30 ~ 80	LAN	1V r.m.s.	A	Pass

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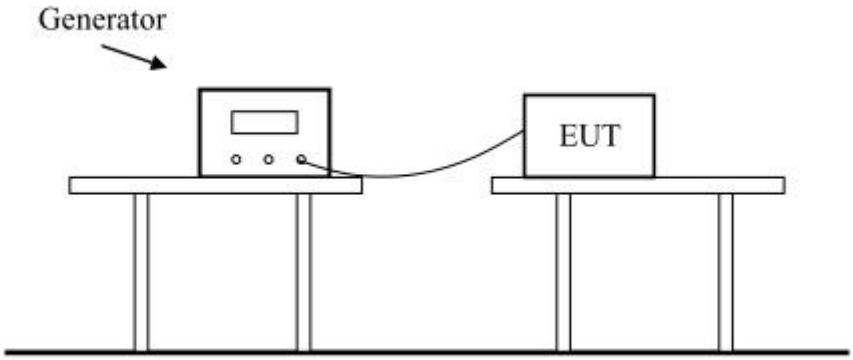
9.6 VOLTAGE DIPS AND INTERRUPTIONS TEST

9.6.1 BLOCK DIAGRAM OF TEST SETUP



9.6.2 TEST SPECIFICATION

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

9.6.3 TEST PROCEDURE

9.6.3.1. Set up the EUT and test generator as shown on Section 9.6.1.

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

9.6.3.3. Record any degradation of performance.

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9.6.4 TEST RESULTS

VOLTAGE DIPS AND INTERRUPTIONS	
Basic Standard:	IEC 61000-4-11:2020
EUT:	Analog Gateway
M/N:	MAG1100
Test Mode:	Normal Working
Test Voltage:	AC 230V/50Hz & AC 120V/60Hz
Temperature:	24.4℃
Humidity:	58%
Atmosphere pressure:	101Kpa

AC 230V				
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (cycle) 50Hz	Performance criteria	Result
< 5	100	0.5	B	Pass
70	30	25	C	Pass
< 5	100	250	C	Pass

AC 120V				
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (cycle) 60Hz	Performance criteria	Result
< 5	100	0.5	B	Pass
70	30	30	C	Pass
< 5	100	300	C	Pass

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APPENDIX A - TEST SETUP PHOTOGRAPHS

Photographs 1: Set-up for Conducted disturbance at mains terminals

Photographs 2: Set-up for Asymmetric mode conducted emission

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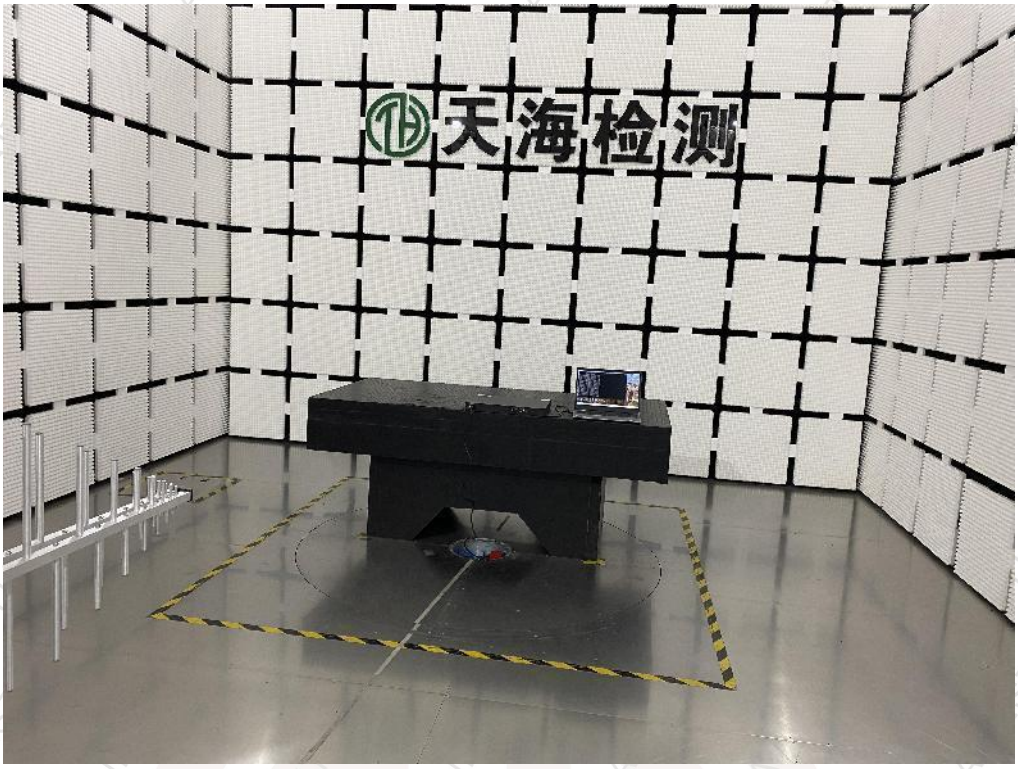
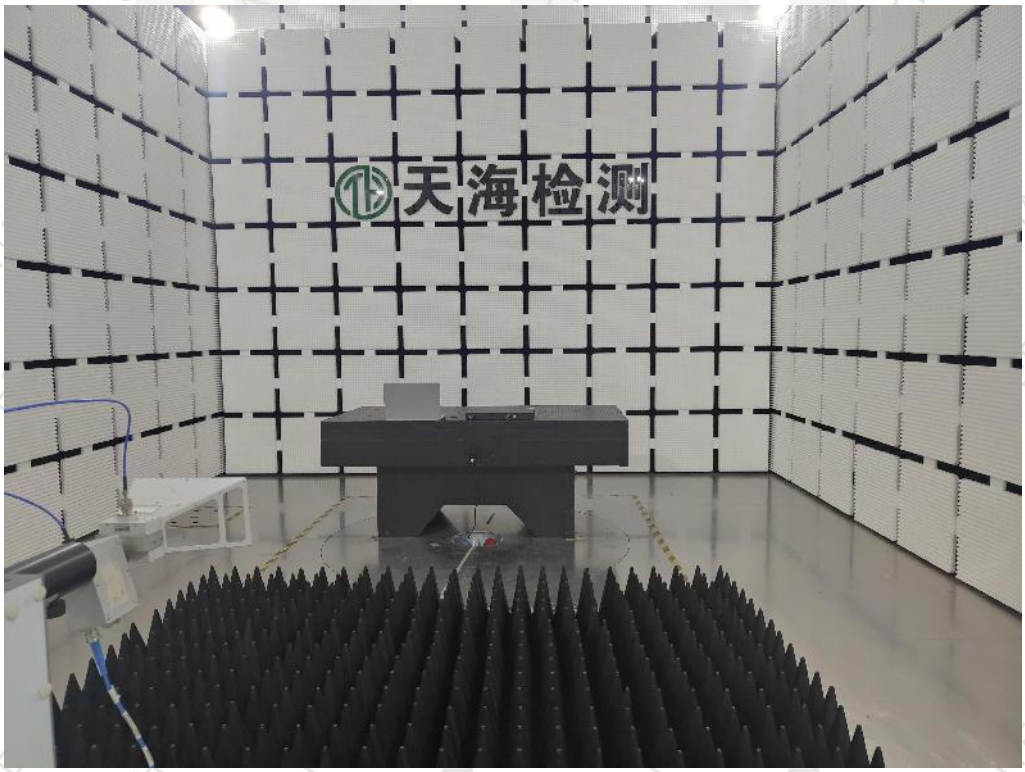
Photographs 3: Set-up for Radiated disturbance(below 1GHz)



Photographs 4: Set-up for Radiated disturbance(above 1GHz)



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Photographs 5: Set-up for Electrostatic discharge (ESD)

Photographs 6: Set-up for Radio-frequency, Continuous radiated disturbance(RS)

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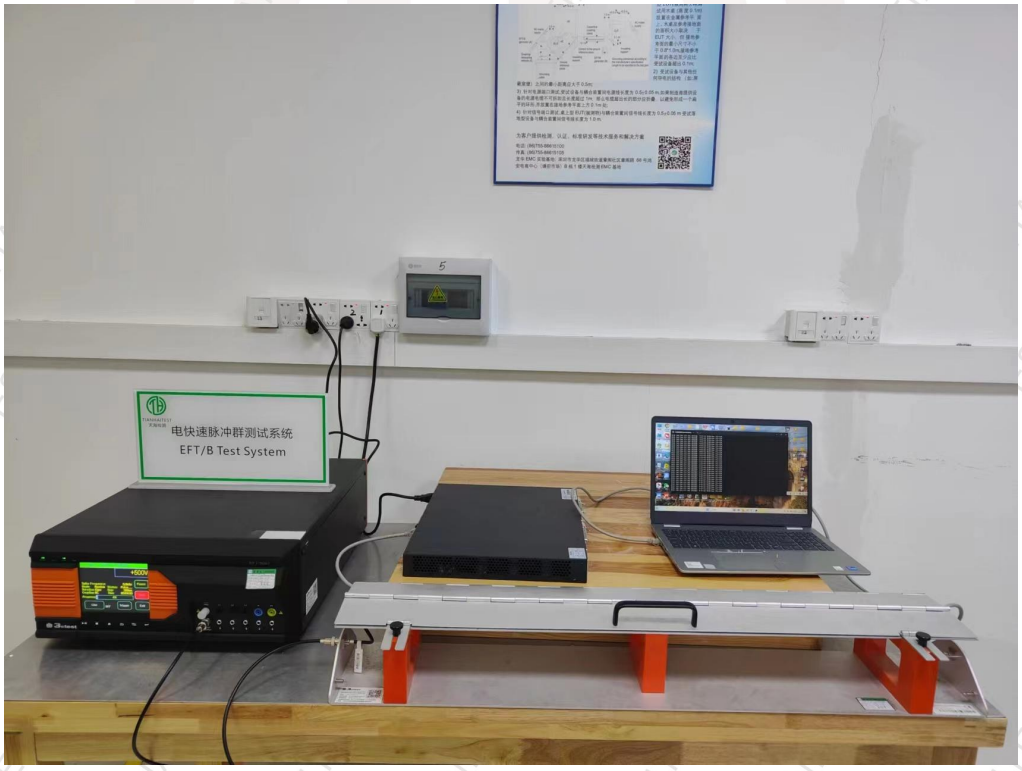
Photographs 7: Set-up for Electrical fast transient (EFT)-AC power port

Photographs 8: Set-up for Electrical fast transient (EFT)-Signal port



Photographs 9: Set-up for Surge -AC power port

Photographs 10: Set-up for Surge -Signal port

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Photographs 11: Set-up for Radio-frequency, Continuous conducted disturbance (CS)-AC power port

Photographs 12: Set-up for Radio-frequency, Continuous conducted disturbance (CS)-Signal port

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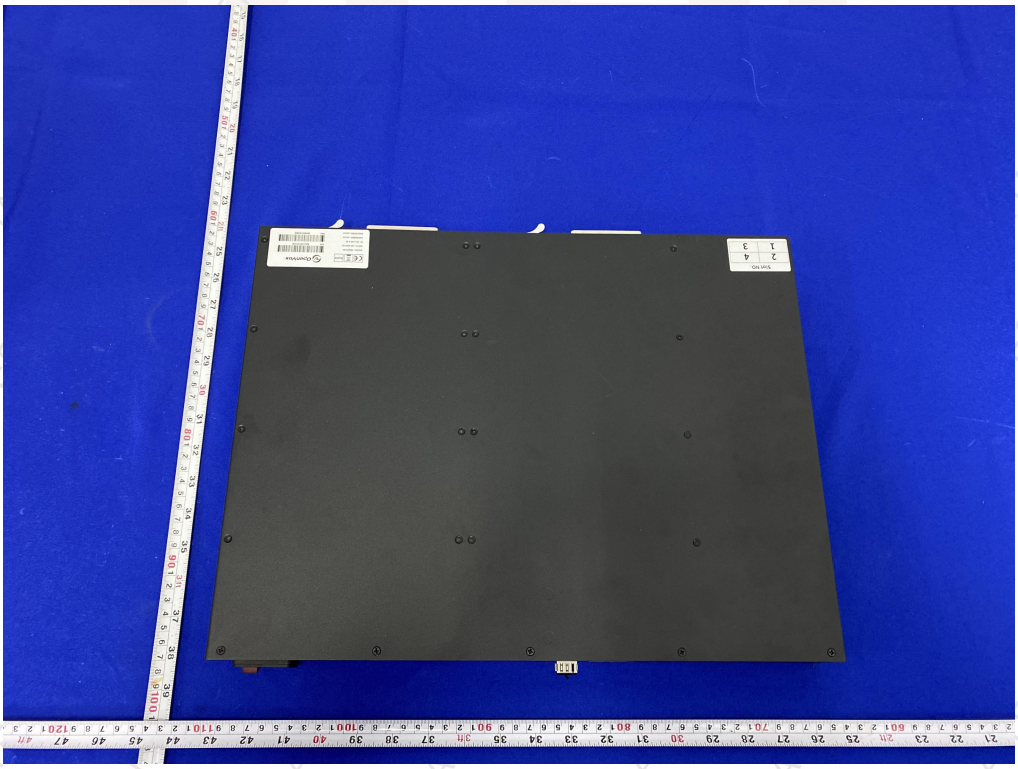
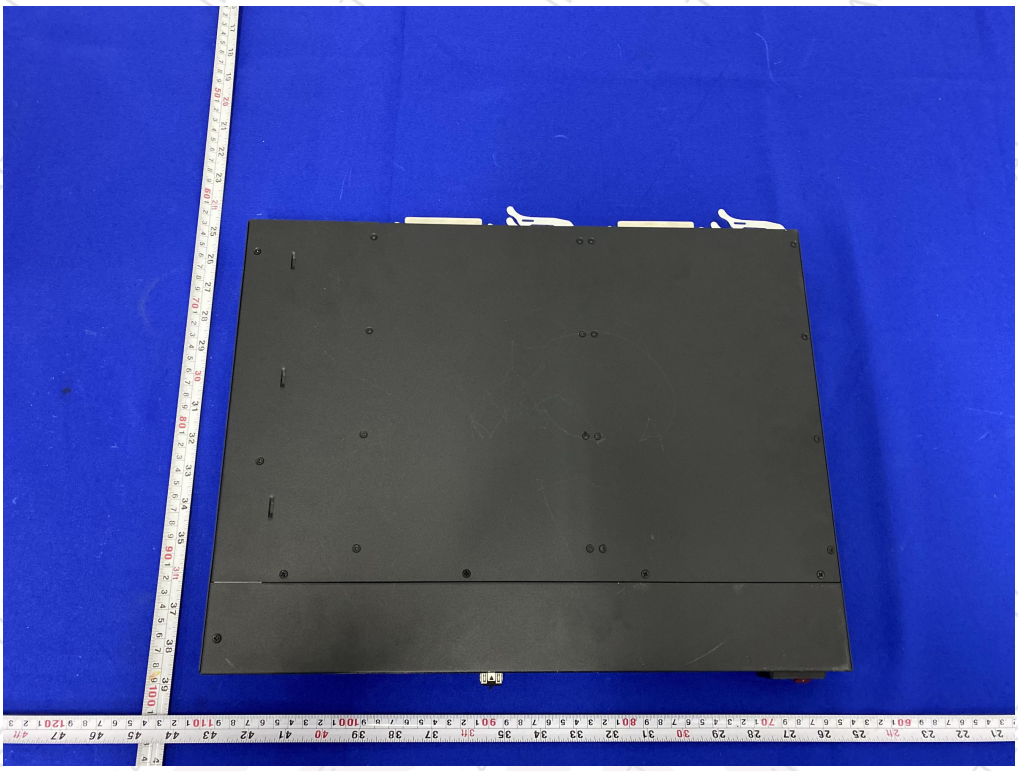
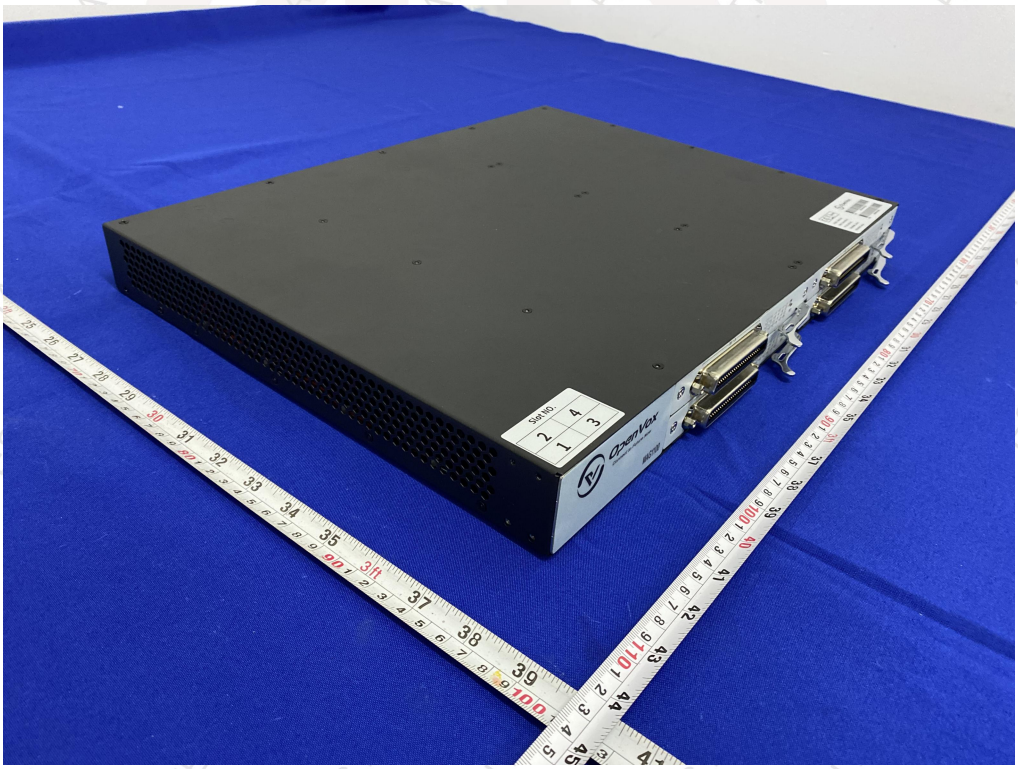
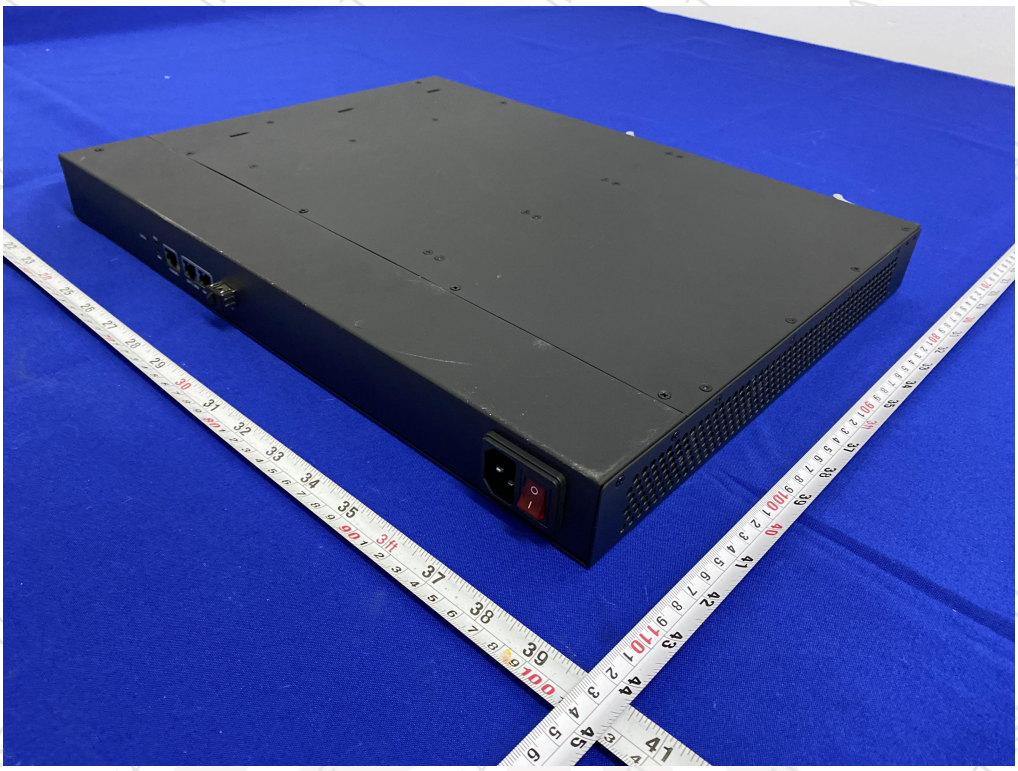
Photographs 13: Set-up for Voltage dips &Voltage interruptions

APPENDIX B - EUT PHOTOGRAPHS









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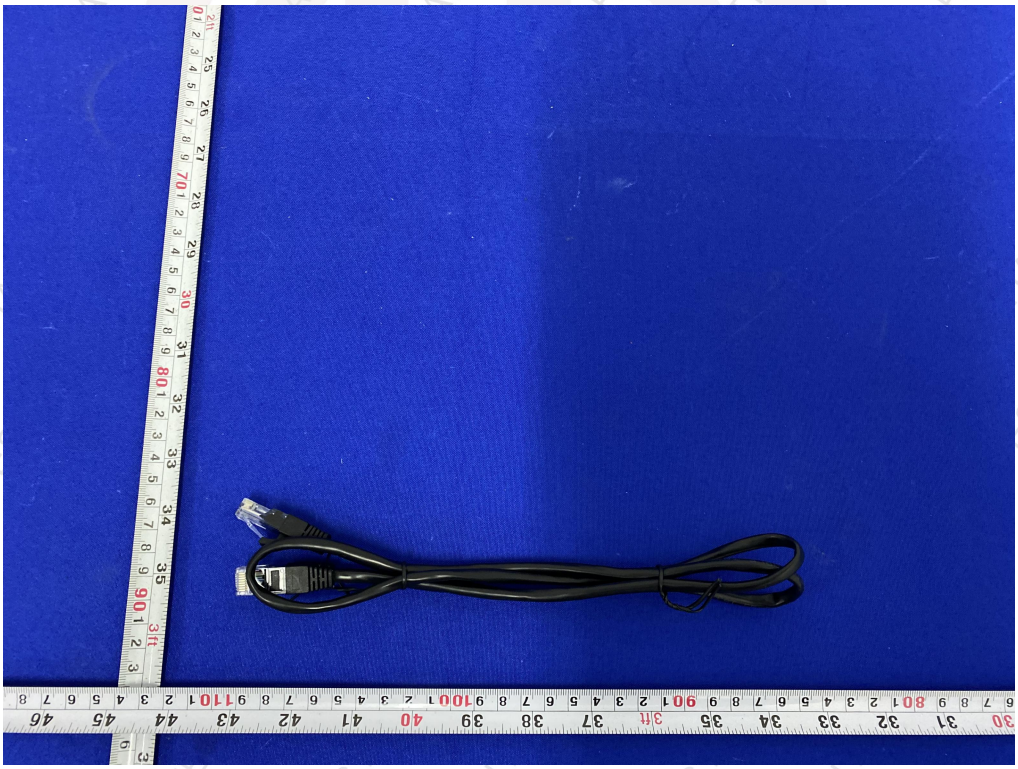

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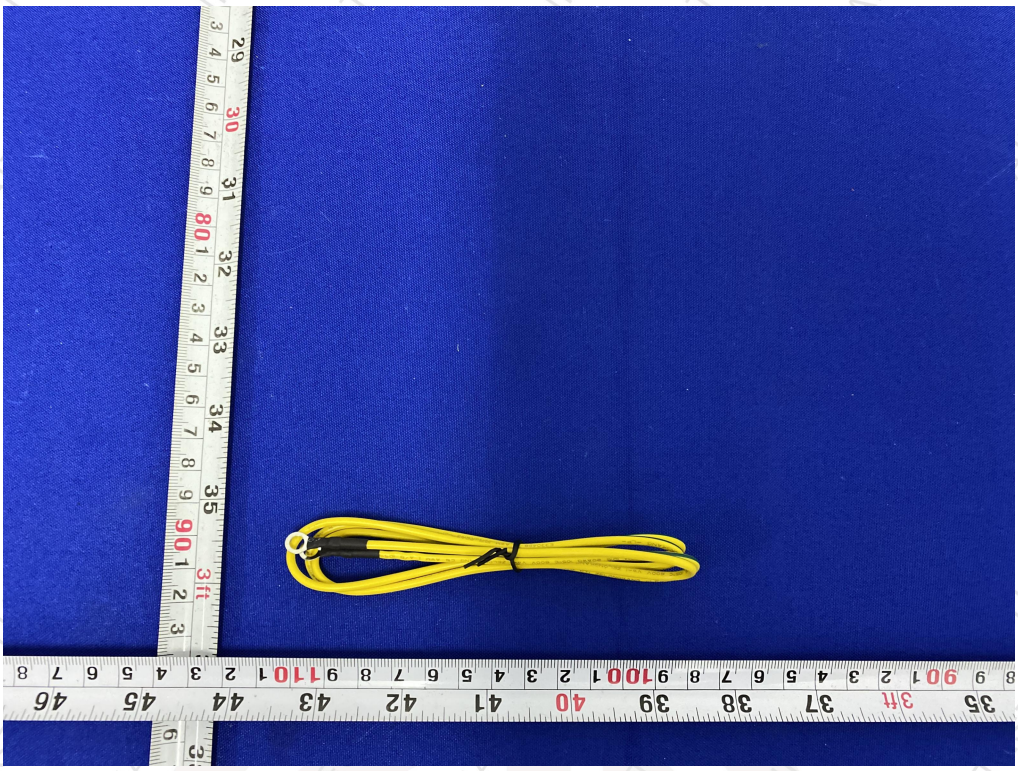

**********END OF THE REPORT**********

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