



EMC TEST REPORT
EN 55032:2015/A11:2020
EN 55035:2017/A11:2020
EN IEC 61000-3-2:2019
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: MAG1000

2021-08-17

This Report Concerns: Original Report	Equipment Type: Analog Gateway
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Report Number: TH2108108-C01-R01	
Test Date: 2021-08-13 to 2021-08-16	<i>Prince Huang</i>
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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 (EN 55032:2015/A11:2020)			
Description of Test Item	Test Standard	Requirement	Results
Conducted disturbance at mains terminals	EN 55032:2015/A11:2020	Class A	PASS
Asymmetric mode conducted emission	EN 55032:2015/A11:2020	Class A	PASS
Radiated disturbance	EN 55032:2015/A11:2020	Class A	PASS
Harmonic current emissions	EN IEC 61000-3-2:2019	/	N/A
Voltage fluctuations & flicker	EN 61000-3-3:2013/A1:2019	/	N/A
IMMUNITY (EN 55035:2017/A11:2020)			
Description of Test Item	Test Standard	Test configuration	Results
Electrostatic discharge (ESD)	IEC 61000-4-2:2008	Air Discharge: $\pm 8\text{kV}$ Contact Discharge: $\pm 4\text{kV}$	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006+AMD1:2007+AMD2:2010	1%, 1kHz, 80% AM 80~1000MHz, 1800MHz 2600MHz, 3500MHz 5000MHz, 3V/m	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2012	AC Input Power: $\pm 1\text{kV}$ Signal Line: $\pm 0.5\text{kV}$ Tr/Td 5/50 ns, 5kHz	PASS
Surge (Input a.c. power ports)	IEC 61000-4-5:2014+AMD1:2017	AC Input Port: 1.2/50(8/20)Tr/Th us line to line: $\pm 1.0\text{kV}$ line to PE: $\pm 2.0\text{kV}$ Signal port: $\pm 0.5\text{kV}$	PASS
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6:2013	1% 1kHz, 80% AM Mod., 0.15MHz-10MHz: 3V 10MHz-30MHz: 3V to 1V 30MHz-80MHz: 1V	PASS
Power frequency magnetic field*	IEC 61000-4-8:2009	--	N/A
Voltage dips, <5% reduction	IEC 61000-4-11:2004	0.5T	PASS
Voltage dips, 70% reduction		25T for 50Hz	PASS



Voltage interruptions, <5% reduction		250T for 50Hz	PASS
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.			

1.2 DESCRIPTION OF PERFORMANCE CRITERIA

General Performance Criteria

General performance criteria are defined in 8.2, 8.3 and 8.4. 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.



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 201A,2/F,Building 2, Asian Industrial Park,Fengmen Road,Bantian Street, longgang District,Shenzhen,Guangdong, China

General Description of E.U.T

EUT Name: **Analog Gateway**
Trade Mark: OpenVox
Model No.: MAG1000
Ratings: AC100-240V, 35W
Test Mode: 1:Full System
2:LAN port 1000Mbps
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 Item	Test Items	Results	Limits
Conducted disturbance	Level accuracy(9kHz to 150kHz)	± 2.63 dB	± 3.8 dB
	(150kHz to 30MHz)	± 2.35 dB	± 3.4 dB
Radiated disturbance	30MHz to 1GHz	± 5.78 dB	± 6.3 dB
	1GHz to 6GHz	± 4.62 dB	± 6.3 dB

(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%.

2.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix B for the actual connections between EUT and support equipment.

Support Equipment

No.	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date	Calculator due date
/	/	/	/	/	/	/

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test.



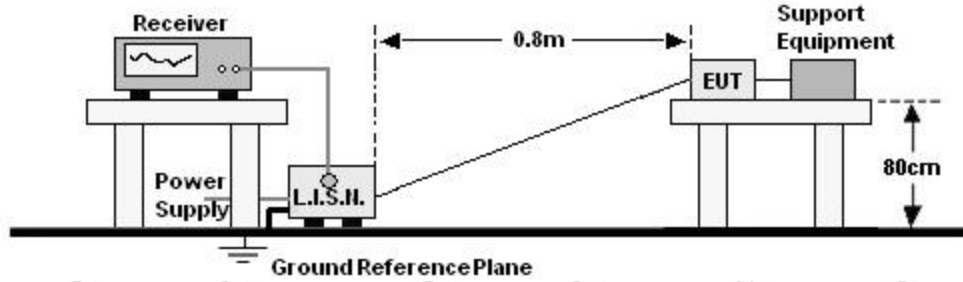
3 - TEST EQUIPMENT LIST AND DETAILS

Kind of Equipment	Manufacturer	Type	S/N	Calibrate until
Conducted Emission				
EMI Test Receiver	R&S	ESRP3	102242	2022-01-03
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2022-01-03
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2022-01-03
Pulse Limiter	Schwarzbeck	VTSD 9561-F	00723	2022-01-03
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2022-01-03
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2022-01-20
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2022-01-03
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2022-01-03
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2022-01-21
ESD				
ESD Simulator	TESEQ	NSG 437	1569	2021-11-16
RS				
Signal Generator	Agilent	M5181A	MY47420649	2021-09-06
Power Meter	Agilent	E4419B	GB43312510	2021-09-06
Bi-Log Antenna	Schwarzbeck	STLP 9128 E	3142	2023-09-10
Horn Antenna	Schwarzbeck	00270	00270	2023-09-10
Power Transmitter	KEYSIGHT	E9301A	MY41069009	2021-09-06
Power Transmitter	KEYSIGHT	E9301A	MY41069011	2021-09-06
EFT				
Burst Tester	3C test	EFT 500T	ES027000120015	2021-11-12
Coupling Clamp	3C test	CCC 100	CCC 20092269	2021-11-12
Surge				
Surge simulator	3C test	CWS 600CT	ES058000920005	2021-11-12
Three phases CDN	3C test	SPN 3832T	ES0911910	2021-11-12
CDN for unshielded symmetrical high-speed Telecom cable	3C test	CDN405T8A	ES064001220010	2021-11-12
CDN for Telecom cable	3C test	CDN405M40-5	ES1071910	2021-11-12
Radio-Frequency Continuous Conducted (CS)				
Conducted Immunity Test System	3C test	CST 1075	ES096000120008	2021-11-12
Voltage Dips and Interruptions				
Power failure simulator	3C test	PFS 2216SD	ES049001220003	2021-11-12



4 - CONDUCTED EMISSION MEASUREMENT

4.1 BLOCK DIAGRAM OF TEST SETUP



4.2 LIMITS

Frequency range (MHz)	Class A Limits (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.50 ~ 30	73	60

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.

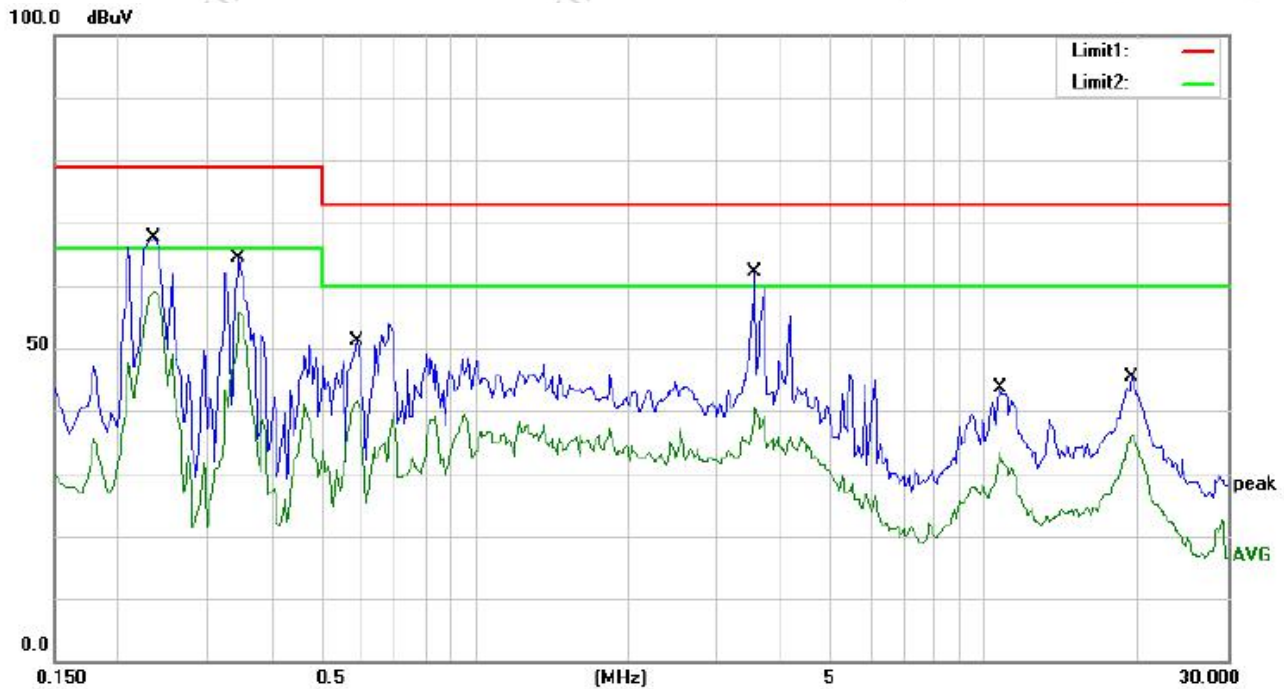
The bandwidth of the field strength meter is set at 9kHz.

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



4.4 TEST RESULTS AND DATA

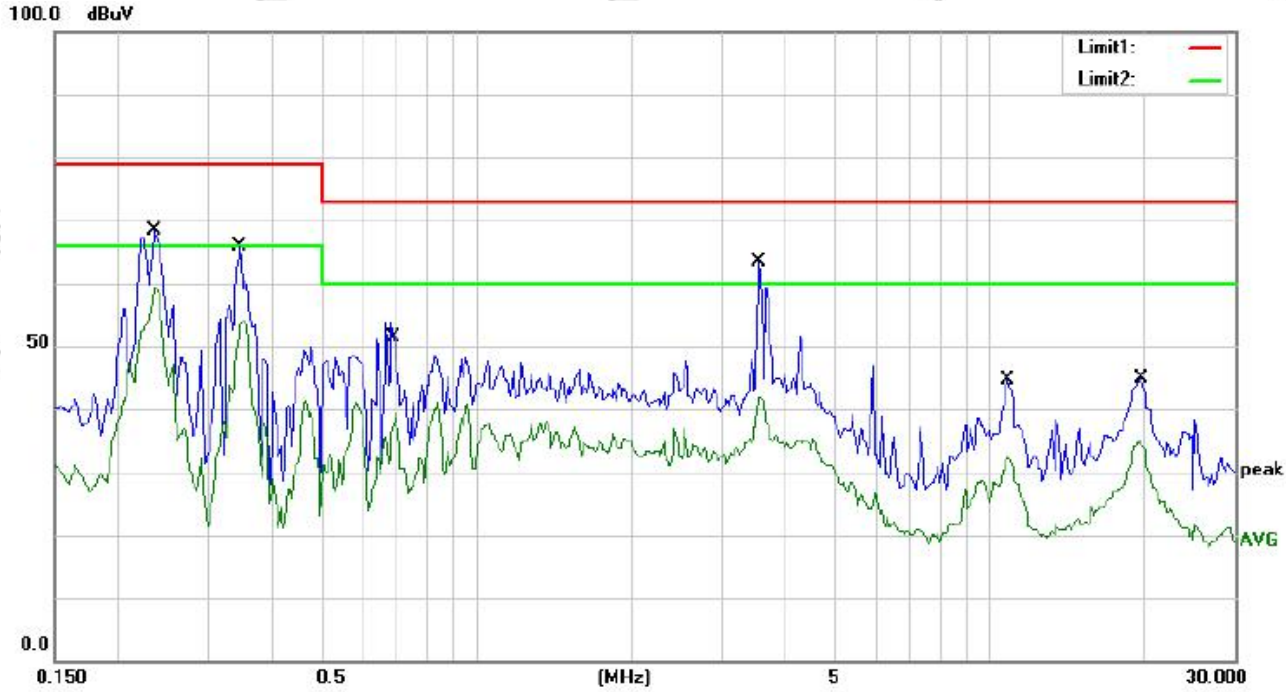
EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Phase:	L1	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2350	67.69	0.00	67.69	79.00	-11.31	QP
2	*	0.2350	58.99	0.00	58.99	66.00	-7.01	AVG
3		0.3450	64.28	0.00	64.28	79.00	-14.72	QP
4		0.3450	55.59	0.00	55.59	66.00	-10.41	AVG
5		0.5900	51.05	0.00	51.05	73.00	-21.95	QP
6		0.5900	41.69	0.00	41.69	60.00	-18.31	AVG
7		3.5500	62.10	0.00	62.10	73.00	-10.90	QP
8		3.5500	40.53	0.00	40.53	60.00	-19.47	AVG
9		10.7800	43.61	0.00	43.61	73.00	-29.39	QP
10		10.7800	33.32	0.00	33.32	60.00	-26.68	AVG
11		19.4400	45.30	0.00	45.30	73.00	-27.70	QP
12		19.4400	36.04	0.00	36.04	60.00	-23.96	AVG



EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Phase:	N	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa

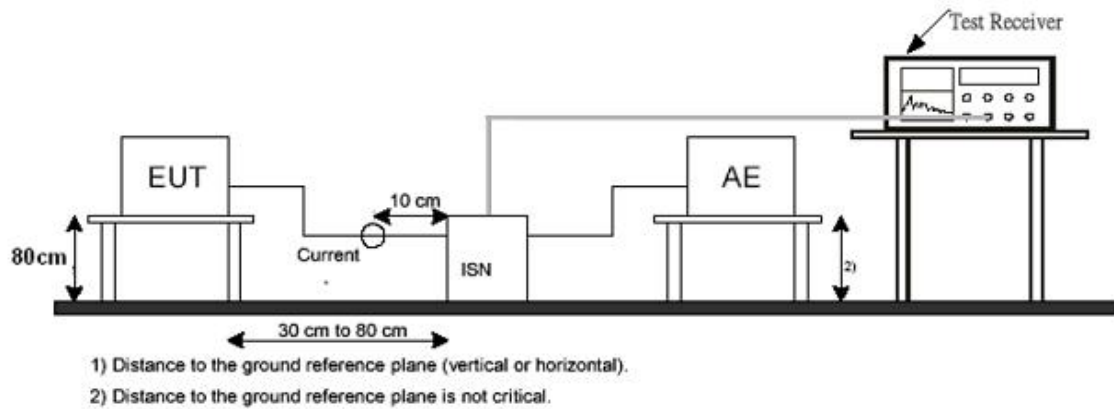


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2350	68.34	0.00	68.34	79.00	-10.66	QP
2	*	0.2350	59.43	0.00	59.43	66.00	-6.57	AVG
3		0.3500	65.80	0.00	65.80	79.00	-13.20	QP
4		0.3500	53.97	0.00	53.97	66.00	-12.03	AVG
5		0.6950	53.66	0.00	53.66	73.00	-19.34	QP
6		0.6950	39.32	0.00	39.32	60.00	-20.68	AVG
7		3.5600	63.41	0.00	63.41	73.00	-9.59	QP
8		3.5600	41.85	0.00	41.85	60.00	-18.15	AVG
9		10.8100	44.56	0.00	44.56	73.00	-28.44	QP
10		10.8100	32.32	0.00	32.32	60.00	-27.68	AVG
11		19.6100	44.88	0.00	44.88	73.00	-28.12	QP
12		19.6100	35.06	0.00	35.06	60.00	-24.94	AVG



5 - ASYMMETRIC MODE CONDUCTED EMISSION MEASUREMENT

5.1 BLOCK DIAGRAM OF TEST SETUP



5.2 LIMITS

Frequency range (MHz)	Class A Limits (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	97 to 87	84 to 74
0.50 ~ 30	87	74

5.3 TEST PROCEDURE

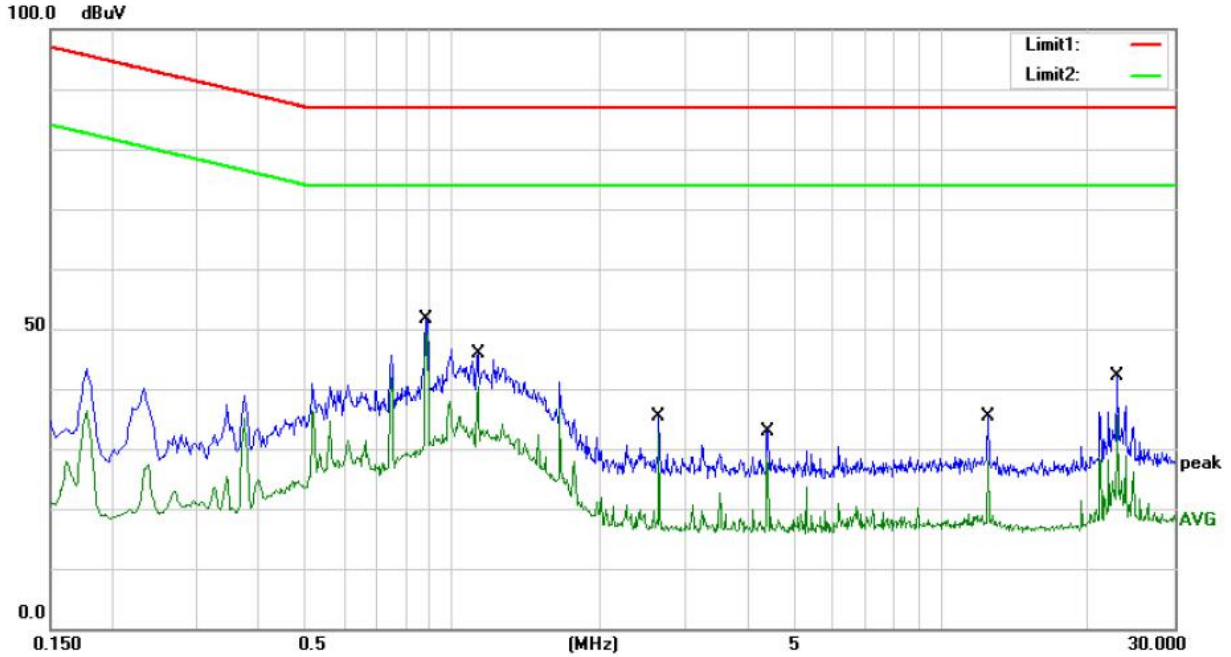
The EUT is put on the plane 0.8m high above the ground by insulating support and selecting ISN for unscreened cable or a current probe for screened cable to take measurement. The port of the EUT was connected to the remote side support equipment through the ISN/Current Probe and communication in normal condition. Making an 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.



EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 2	Test Voltage :	AC230V/50Hz
Temperature:	26°C	Humidity:	54%
Atmosphere pressure:	101Kpa		



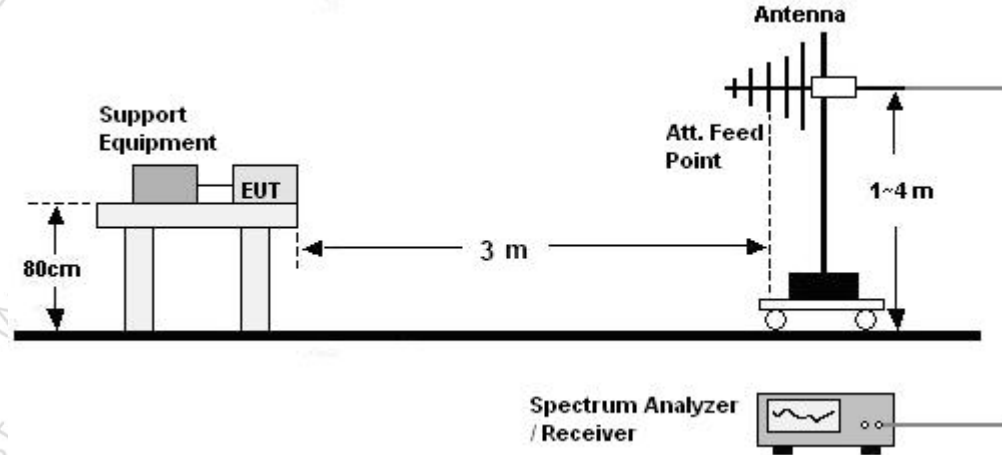
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector
1		0.8820	41.85	9.82	51.67	87.00	-35.33	QP
2	*	0.8820	39.59	9.82	49.41	74.00	-24.59	AVG
3		1.1260	35.94	9.85	45.79	87.00	-41.21	QP
4		1.1260	30.65	9.85	40.50	74.00	-33.50	AVG
5		2.6460	25.61	9.86	35.47	87.00	-51.53	QP
6		2.6460	22.84	9.86	32.70	74.00	-41.30	AVG
7		4.4100	23.07	9.87	32.94	87.00	-54.06	QP
8		4.4100	18.59	9.87	28.46	74.00	-45.54	AVG
9		12.5060	24.71	10.65	35.36	87.00	-51.64	QP
10		12.5060	17.35	10.65	28.00	74.00	-46.00	AVG
11		22.9060	31.44	10.69	42.13	87.00	-44.87	QP
12		22.9060	24.94	10.69	35.63	74.00	-38.37	AVG



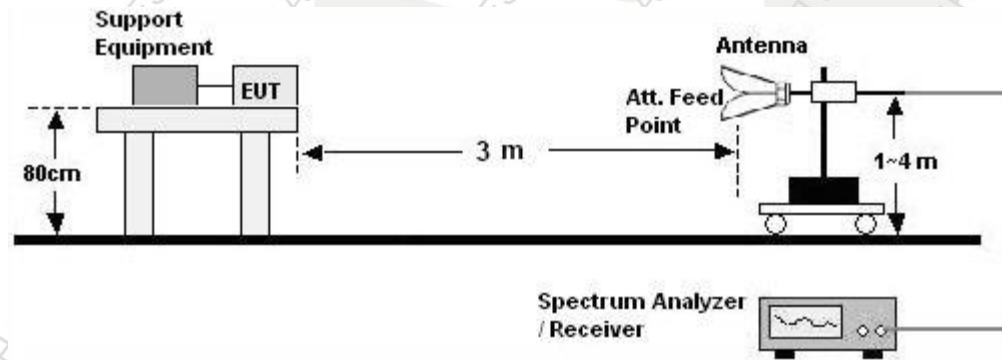
6 - RADIATED DISTURBANCE MEASUREMENT

6.1 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz



Above 1GHz



6.2 LIMITS

Below 1GHz

Frequency (MHz)	Class A Quasi-peak Limits at 3m dB(μV/m)
30-230	50
230-1000	57

Above 1GHz

Frequency (MHz)	Class A Limits at 3m	
	Peak dB(μV/m)	Average
1000-3000	76	56
3000-6000	80	60



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. 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



6.4 TEST RESULTS AND DATA

Below 1GHz

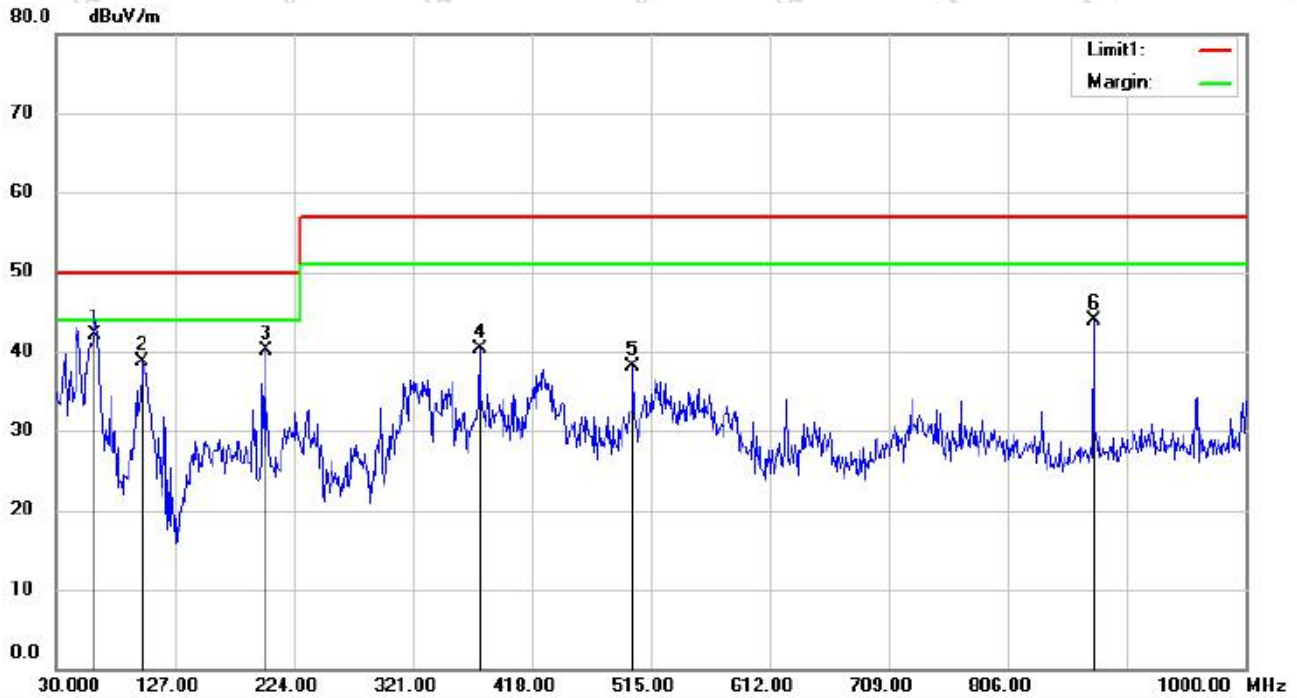
EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Polarization:	Horizontal	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		109.5400	52.72	-12.60	40.12	50.00	-9.88	QP
2	*	177.4400	56.79	-14.29	42.50	50.00	-7.50	QP
3		342.3400	54.54	-8.30	46.24	57.00	-10.76	QP
4		500.4500	50.04	-5.55	44.49	57.00	-12.51	QP
5		625.5800	46.15	-2.99	43.16	57.00	-13.84	QP
6		875.8400	46.95	-0.22	46.73	57.00	-10.27	QP



EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Polarization:	Vertical	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa

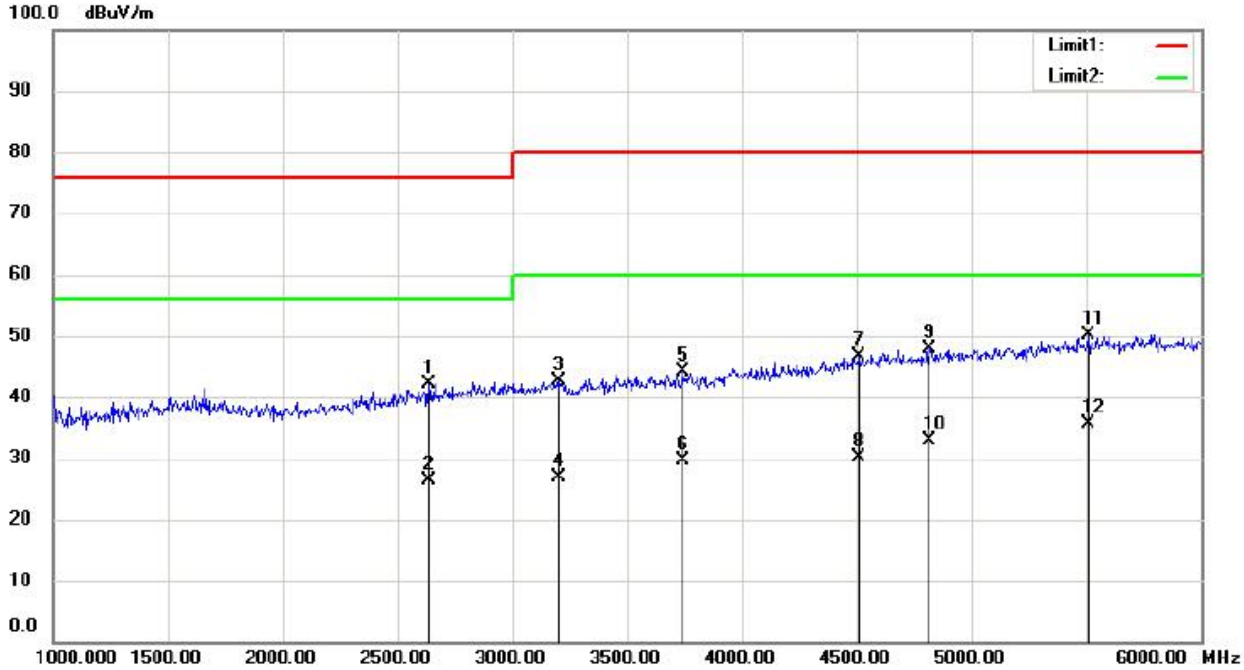


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	62.0100	55.58	-13.48	42.10	50.00	-7.90	QP
2		100.8100	50.81	-12.15	38.66	50.00	-11.34	QP
3		200.7200	53.10	-12.94	40.16	50.00	-9.84	QP
4		375.3200	48.35	-7.98	40.37	57.00	-16.63	QP
5		500.4500	43.64	-5.55	38.09	57.00	-18.91	QP
6		875.8400	44.09	-0.22	43.87	57.00	-13.13	QP



Above 1GHz

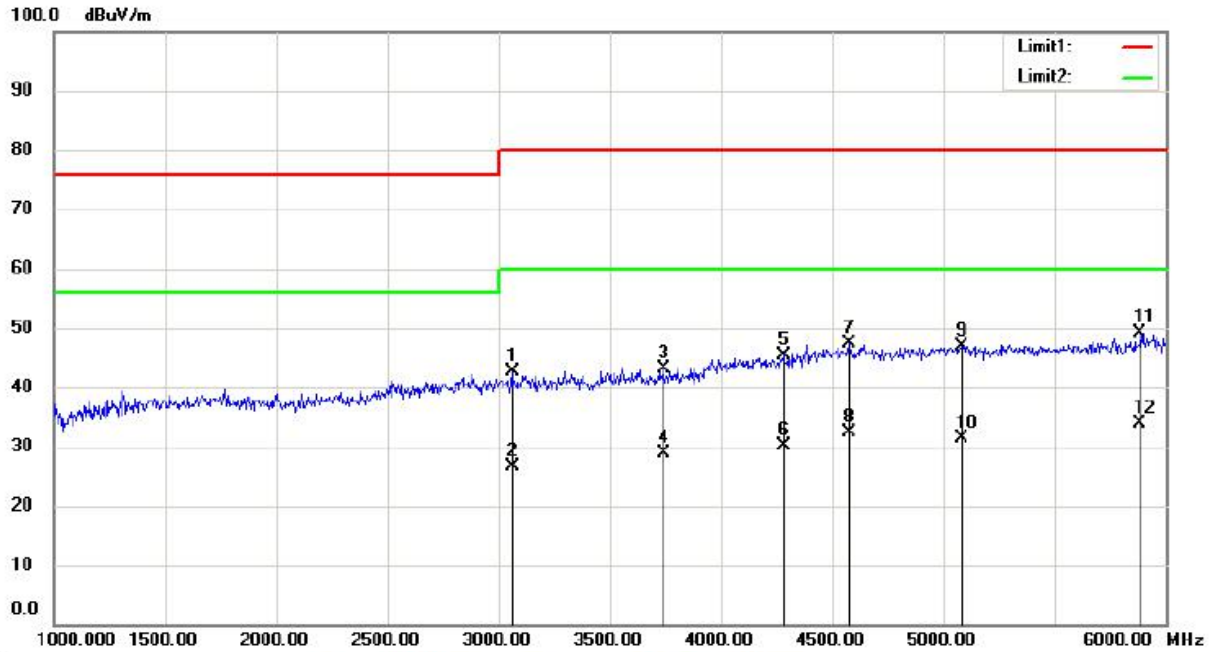
EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Polarization:	Horizontal	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector
1		2635.000	52.90	-10.76	42.14	76.00	-33.86	peak
2		2635.000	37.06	-10.76	26.30	56.00	-29.70	AVG
3		3205.000	51.07	-8.35	42.72	80.00	-37.28	peak
4		3205.000	35.15	-8.35	26.80	60.00	-33.20	AVG
5		3740.000	51.34	-7.21	44.13	80.00	-35.87	peak
6		3740.000	36.91	-7.21	29.70	60.00	-30.30	AVG
7		4510.000	52.00	-5.27	46.73	80.00	-33.27	peak
8		4510.000	35.37	-5.27	30.10	60.00	-29.90	AVG
9		4815.000	52.32	-4.45	47.87	80.00	-32.13	peak
10		4815.000	37.25	-4.45	32.80	60.00	-27.20	AVG
11		5510.000	52.24	-2.05	50.19	80.00	-29.81	peak
12	*	5510.000	37.75	-2.05	35.70	60.00	-24.30	AVG



EUT:	Analog Gateway	M/N:	MAG1000
Test Mode:	Mode 1	Test Voltage :	AC230V/50Hz
Polarization:	Horizontal	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa

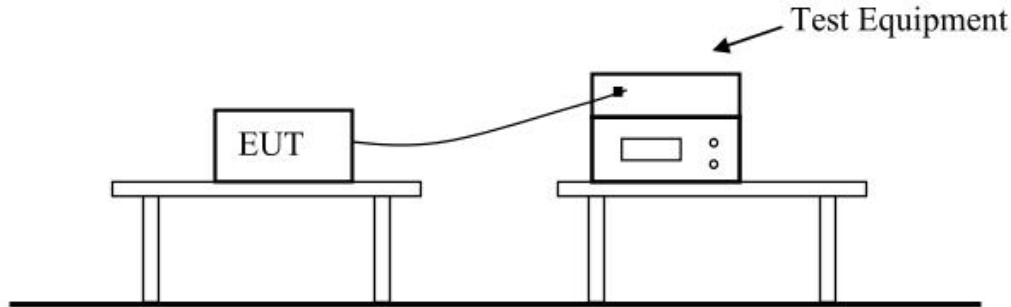


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		3060.000	51.33	-8.66	42.67	80.00	-37.33	peak
2		3060.000	35.36	-8.66	26.70	60.00	-33.30	AVG
3		3740.000	50.33	-7.21	43.12	80.00	-36.88	peak
4		3740.000	36.11	-7.21	28.90	60.00	-31.10	AVG
5		4280.000	51.26	-5.89	45.37	80.00	-34.63	peak
6		4280.000	35.99	-5.89	30.10	60.00	-29.90	AVG
7		4575.000	52.42	-5.10	47.32	80.00	-32.68	peak
8		4575.000	37.50	-5.10	32.40	60.00	-27.60	AVG
9		5085.000	50.57	-3.63	46.94	80.00	-33.06	peak
10		5085.000	35.13	-3.63	31.50	60.00	-28.50	AVG
11		5885.000	49.76	-0.66	49.10	80.00	-30.90	peak
12	*	5885.000	34.46	-0.66	33.80	60.00	-26.20	AVG



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

7.3 Test procedure

- 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.
- 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.

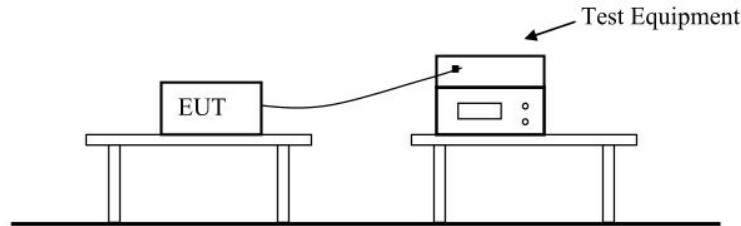
7.4 TEST RESULTS

Because power of EUT's rated power is 35W and less than 75W, According standard EN IEC 61000-3-2:2019, the result no judgment.



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

8.3 TEST PROCEDURE

- 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.
- 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

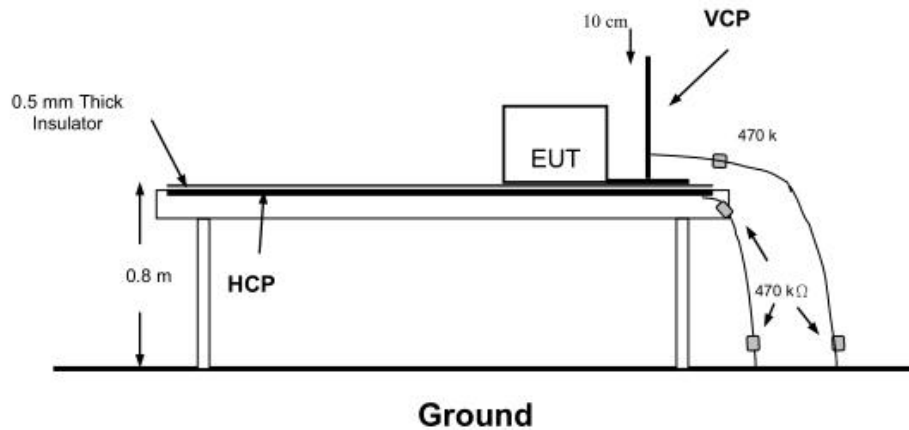
The active power of the EUT is about 35W only, which unlikely to produce significant voltage fluctuation. Therefore no test was applied.

According to 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...."



9 - ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1 BLOCK DIAGRAM OF TEST SETUP



9.2 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

9.3 TEST PROCEDURE

9.3.1. 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.

9.3.2. Contact Discharge

All the procedure shall be same as Section 9.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.3.3. 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.

9.3.4. 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.



9.4 TEST RESULTS

Electrostatic Discharge	
Basic Standard	IEC 61000-4-2:2008
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1
Temperature:	24℃
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	B

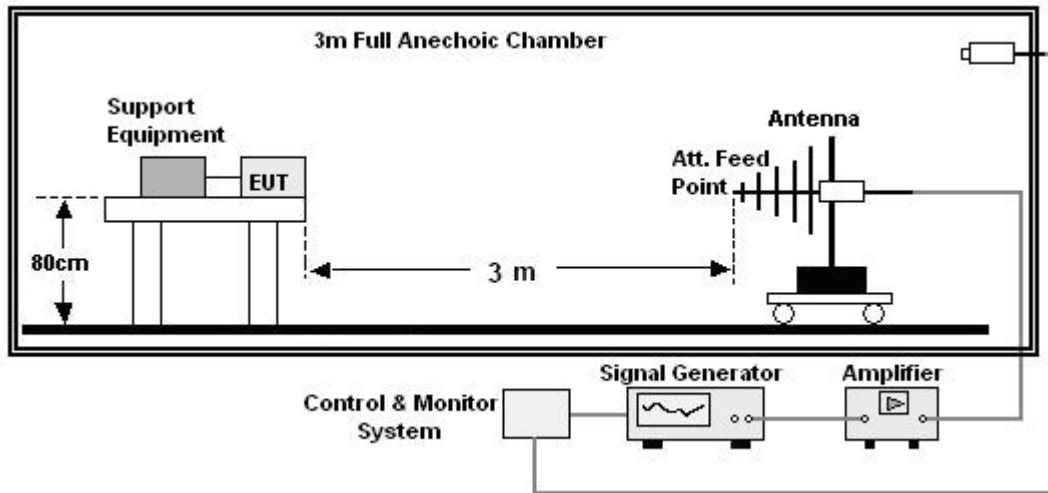
Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Performance	Actual performance	Result
Contact Discharge	Indirect Discharge HCP	4	10	B	B	Pass
	Indirect Discharge VCP	4	10	B	B	Pass
	Surface	4	10	B	B	Pass
	RJ21/ console/LAN/ power port	4	10	B	B	Pass
Air Discharge	Indicator light	8	10	B	B	Pass



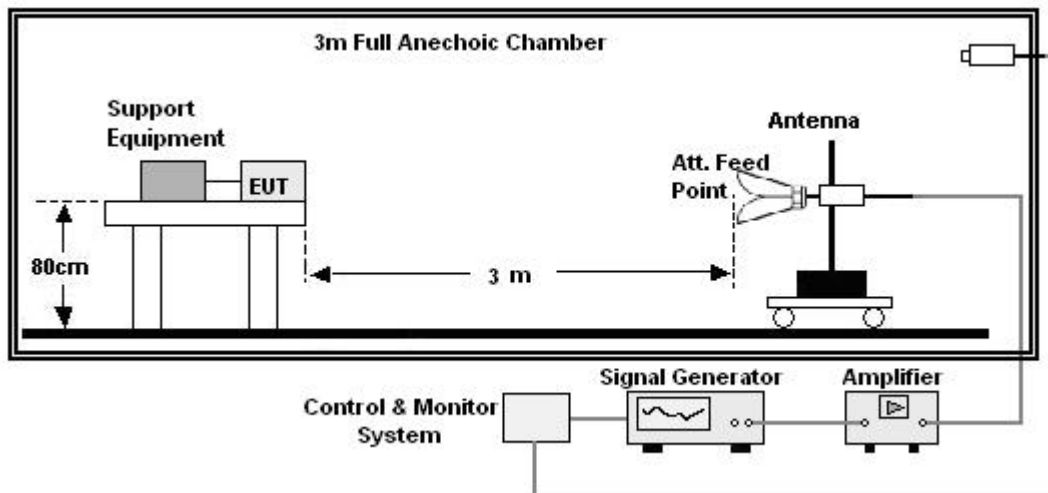
10 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS

10.1 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz



Above 1GHz



10.2 TEST SPECIFICATION

Basic Standard	: IEC 61000-4-3:2006+AMD1:2007+AMD2:2010
Test Port	: Enclosure port
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second
Polarization	: Horizontal & Vertical

10.3 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, 6000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-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.

10.4 TEST RESULTS

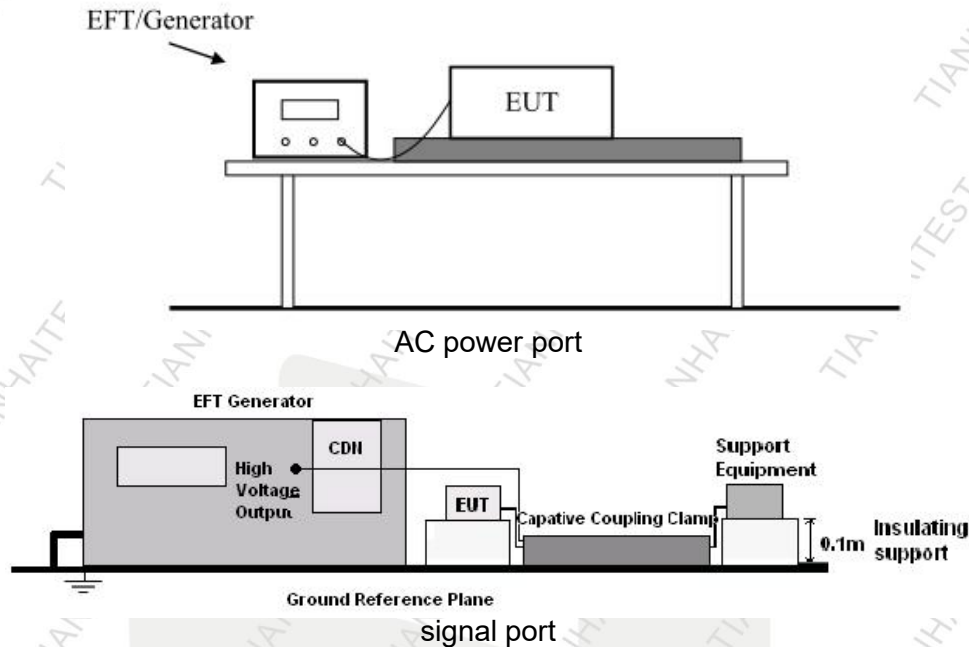
Radio frequency electromagnetic fields	
Basic Standard	IEC 61000-4-3:2006+AMD1:2007+AMD2:2010
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1
Temperature:	24°C
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	A

Frequency (MHz)	Position	Field Strength (V/m)	Required Performance	Actual performance	Result
80 - 1000	Front	3	A	A	Pass
	Back	3	A	A	Pass
	Left	3	A	A	Pass
	Right	3	A	A	Pass
1800	Front	3	A	A	Pass
	Back	3	A	A	Pass
	Left	3	A	A	Pass
	Right	3	A	A	Pass
2600	Front	3	A	A	Pass
	Back	3	A	A	Pass
	Left	3	A	A	Pass
	Right	3	A	A	Pass
3500	Front	3	A	A	Pass
	Back	3	A	A	Pass
	Left	3	A	A	Pass
	Right	3	A	A	Pass
6000	Front	3	A	A	Pass
	Back	3	A	A	Pass
	Left	3	A	A	Pass
	Right	3	A	A	Pass



11 - ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

11.1 BLOCK DIAGRAM OF TEST SETUP



11.2 TEST SPECIFICATION

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

11.3 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.

11.3.1. 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.

11.3.2. 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.



11.3.3. For DC output line ports:

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

11.4 TEST RESULTS

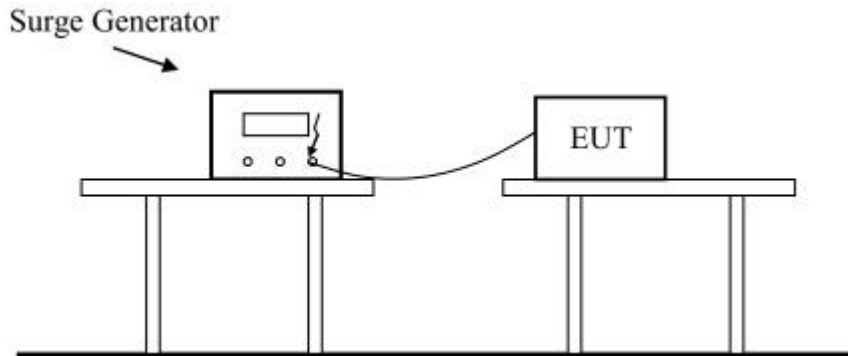
Electrical Fast Transient/Burst	
Basic Standard	IEC 61000-4-4:2012
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1,Mode 2
Temperature:	24°C
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	A

Line	Test Voltage	Required Performance	Actual performance	Result
L-N	±1kV	B	A	Pass
L-PE	±1kV	B	A	Pass
N-PE	±1kV	B	A	Pass
L-N-PE	±1kV	B	A	Pass
LAN	±0.5kV	B	A	Pass



12 - SURGE IMMUNITY TEST

12.1 BLOCK DIAGRAM OF TEST SETUP



12.2 TEST SPECIFICATION

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

12.3 TEST PROCEDURE

12.3.1. Set up the EUT and test generator as shown on Section 12.1.

12.3.2. 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.

12.3.3. The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestors were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

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

12.3.5. Different phase angles are done individually.

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



12.4 TEST RESULTS

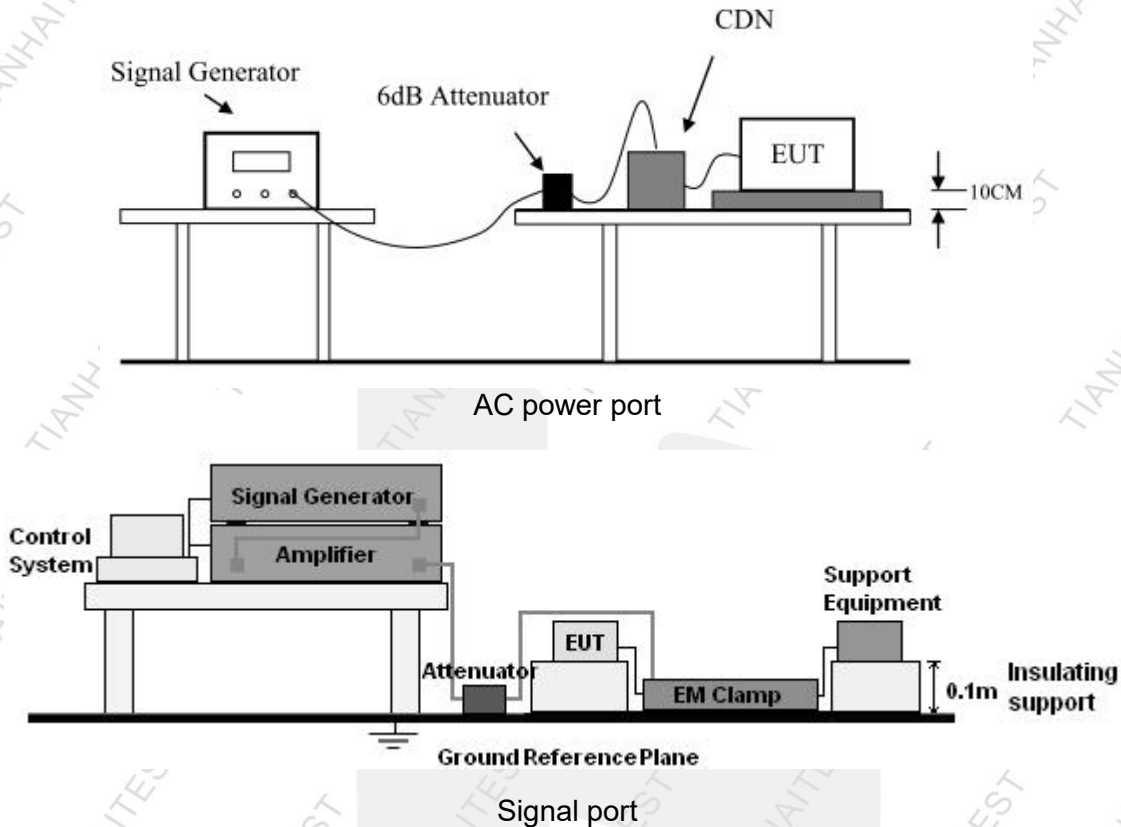
SURGE IMMUNITY	
Basic Standard	IEC 61000-4-5:2014+AMD1:2017
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1, Mode 2
Temperature:	24°C
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	A

Line	Phase Angle	Test Voltage	Required Performance	Actual performance	Result
L-N	90°	±1kV	B	A	Pass
	270°	±1kV	B	A	Pass
L-PE	90°	±2kV	B	A	Pass
	270°	±2kV	B	A	Pass
N-PE	90°	±2kV	B	A	Pass
	270°	±2kV	B	A	Pass
LAN	/	±0.5kV	B	A	Pass



13 - INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1 BLOCK DIAGRAM OF TEST SETUP



13.2 TEST SPECIFICATION

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

13.3 TEST PROCEDURE

13.3.1. Set up the EUT, CDN and test generators as shown on Section 13.1.

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

13.3.3. 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).

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

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



13.3.6. 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.

13.3.7. 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.

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

13.4 TEST RESULTS

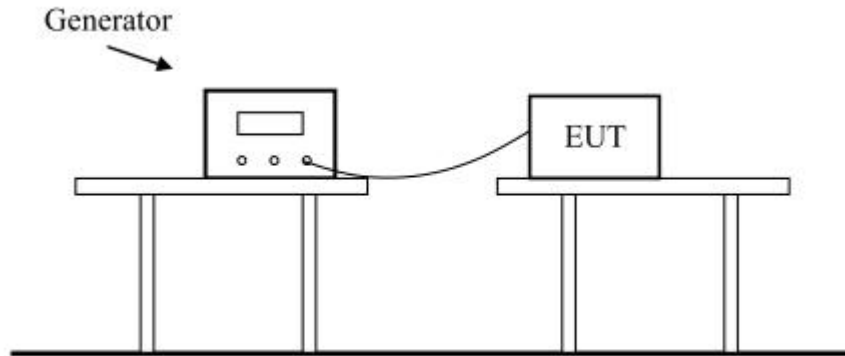
INJECTED CURRENTS SUSCEPTIBILITY	
Basic Standard	IEC 61000-4-6:2013
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1, Mode 2
Temperature:	24°C
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	A

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



14 - VOLTAGE DIPS AND INTERRUPTIONS TEST

14.1 BLOCK DIAGRAM OF TEST SETUP



14.2 TEST SPECIFICATION

Basic Standard : IEC 61000-4-11:2004
 Test Port : input a.c. power port
 Phase Angle : 0°, 180°

14.3 TEST PROCEDURE

14.3.1. Set up the EUT and test generator as shown on Section 14.1.

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

14.3.3. Record any degradation of performance.

14.4 TEST RESULTS

VOLTAGE DIPS AND INTERRUPTIONS	
Basic Standard	IEC 61000-4-11:2004
EUT	Analog Gateway
M/N	MAG1000
Test Mode	Mode 1
Temperature:	24°C
Humidity:	60%
Atmosphere pressure:	101Kpa
Criterion:	B

Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in periods)	Required Performance	Actual performance	Result
< 5	100	0.5	B	B	Pass
70	30	25	C	B	Pass
< 5	100	250	C	B	Pass



APPENDIX A - EUT PHOTOGRAPHS

.External Photos of EUT

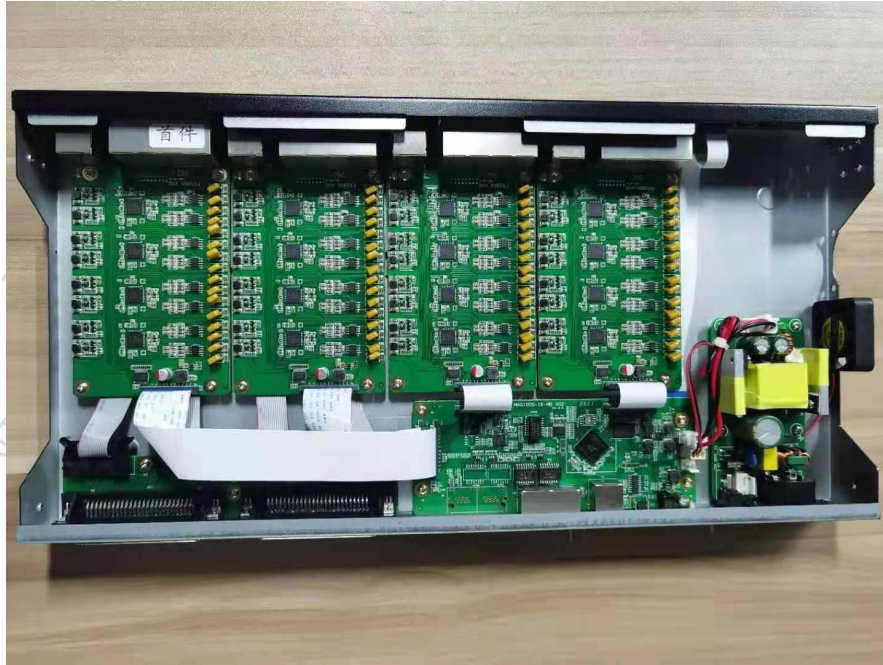








Internal Photos of EUT



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