Test Report

Report No.	:	GOM190723128T
Applicant	:	Zhejiang Wowtech M&E Products Co., Ltd.
Address	:	No.1 Gaoqiu Road, Dongqianhu Innovative Industrial Park, Yinzhou District, Ningbo 315124, China
Manufacturer	:	Zhejiang Wowtech M&E Products Co., Ltd.
Address	:	No.1 Gaoqiu Road, Dongqianhu Innovative Industrial Park, Yinzhou District, Ningbo 315124, China
Product	:	Ozone Air Purifier
Model	:	OLK-A-03, OLK-A-04, OLK-A-05
Test Model	:	OLK-A-03
Standard(s)/Regulation(s)	:	EN 55014-1:2006+A2:2011, EN 55014-2:1997+A2:2008
Date of Test	:	01/07/2019 - 23/07/2019
Date of Issue	:	23/07/2019
Complied By	:	
Reviewed By	:	
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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 55014-1: 2006+A2: 2011)			
Description of Test Item	**Standard**	**Limits**	**Results**
Conducted disturbance at mains terminals	EN 55014-1: 2006+A2: 2011	--------	PASS
Clicks	EN 55014-1: 2006+A2: 2011	--------	PASS
Disturbance Power	EN 55014-1: 2006+A2: 2011	--------	PASS
Radiated disturbance	EN 55022: 2010	Class A	N/A
Harmonic current emissions	EN 61000-3-2: 2014	Class A	PASS
Voltage fluctuations & flicker	EN 61000-3-3: 2013	--------	PASS
IMMUNITY (EN 55014-2: 2015)			
Description of Test Item	**Standard**	**Limits**	**Results**
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2: 2010	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4: 2012	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5: 2014	B	PASS
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014	A	PASS
Power frequency magnetic field	EN 61000-4-8: 2010	A	PASS
Voltage dips, 60% reduction	EN 61000-4-11: 2004+A1:2017	C	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

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.

1.2.1Performance 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 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

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 deriver 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.

2. GENERAL INFORMATION

2.1 Description of Device (EUT)

Product	:	OZONE AIR PURIFIER
Trade Mark	:	N/A
Model	:	OLK-A-03
Power Supply	:	AC 100-240V, 50Hz, 6W
EUT Clock Frequency	:	≤108MHz

2.2 Statement of the measurement uncertainty

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 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the 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 (Ulab)**	**Expanded uncertainty (Ucispr)**
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 4.0 dB ± 3.6 dB
Power disturbance	(30MHz to 300MHz)	± 2.90 dB	± 4.5 dB
Mains Harmonic	Voltage	± 0.510%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.510%	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 MEASURING DEVICES AND TEST EQUIPMENT

3.1. Conducted Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	R0HDE & SCH/ARZ	ESCI	101142	2019/06/18
2	10dB Attenuator	SCH/ARZBECK	0SPAM236	9729	2019/06/18
3	Artificial Mains	R0HDE & SCH/ARZ	ENV216	101288	2019/06/18
4	EMI Test Software	AUDIX	E3	N/A	2019/06/18
5	ISN	SCHWARZBECK	NTFM 8158	NTFM 8158 0120	2018-06-18

3.2. Disturbance Power

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
2	EMI Test Receiver	R0HDE&SCH/ARZ	ESR 7	101181	2019/06/18
3	Absorbing clamp	R0HDE&SCH/ARZ	MDS 21	4033	2018/10/18
4	EMI Test Software	AUDIX	E3	N/A	N/A
5	6dB Attenuator	N/A	N/A	50FP-006-H3 B	2019/06/18

3.3. Harmonic Current

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2019/06/18

3.4. Voltage fluctuation and Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2019/06/18

3.5. Electrostatic Discharge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	SCHL0DER	SESD 230	604035	2019/06/18

3.6. RF Field Strength Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERAT0R	R&S	SMB100A	105942	2018/09/14
2	RF Power Amplifier	B0NN Elektronik	BL/A0830-160/100/40D	128740	2018/09/14
3	Log-periodic Antenna	SCH/ARZBECK	STLP9128D	043	2018/09/14
4	Power Meter	R&S	102031	16829	2018/09/14

3.7. Electrical Fast Transient/Burst

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Electrical fast transient(EFT)generator	3CTEST	EFT-4021	EC0461044	2019/06.18
2	Coupling Clamp	3CTEST	EFTC	EC0441098	2019/06/18

3.8.Surge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Surge test system	3CTEST	SG5006G	EC5581070	2019-06-18
2	Coupling/decoupling network	3CTEST	SGN-5010G	CS5591033	2019-06-18

3.9. Conducted Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Simulator	EMTEST	C / S500C	0900-12	2019/06/18
2	CDN	EMTEST	CDN-M2	5100100100	2019/06/18
3	CDN	EMTEST	CDN-M3	0900-11	2019/06/18
4	CDN	EMTEST	CDN-M	0900-12	2019/06/18
5	Attenuator	EMTEST	ATT6	0010222A	2019/06/18

3.10. Voltage Dips

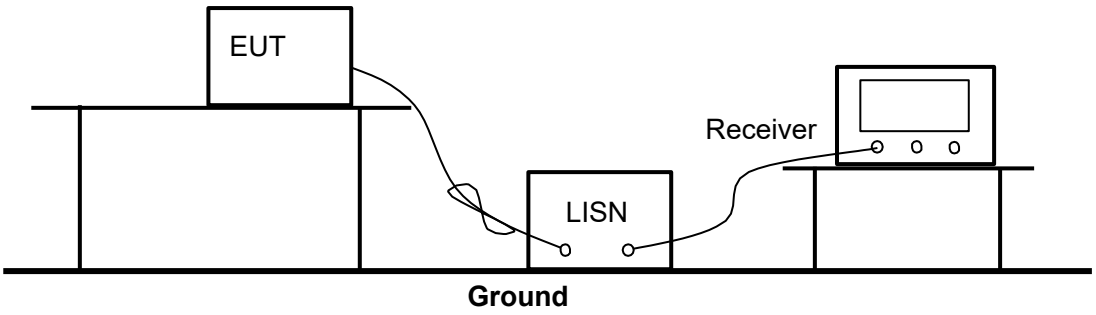
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2019/06/18

3.12. Voltage Short Interruptions

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2019/06/18

4 POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1 Block Diagram of Test Setup



4.2 Power Line Conducted Emission Limits

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	79	66.0*
0.50 ~ 5.00	73	66.0
5.00 ~ 30.00	73	60.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

4.3 EUT Configuration on Test

The following equipments are installed on Conducted Emission Measurement to meet EN 55014–1 requirements and operating in a manner which tends to maximize its emission characteristics in a ON application.

4.4 Operating Condition of EUT

4.4.1 Setup the EUT as shown on Section 4.1.
4.4.2 Turn on the power of all equipment.
4.4.3 Let the EUT work in measuring mode (ON) and measure it.

4.5 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 55014-1 regulations during conducted emission measurement.

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

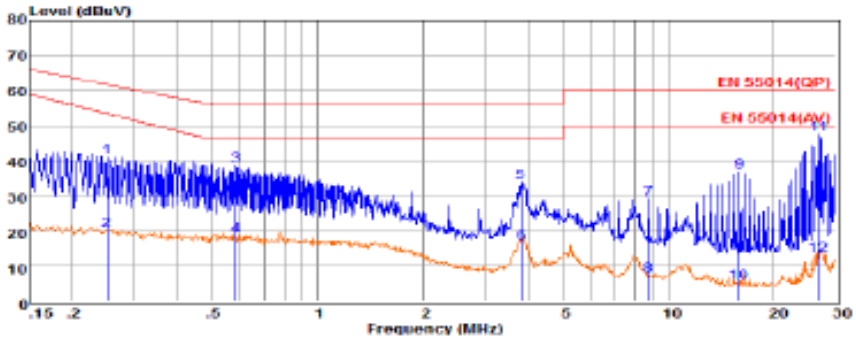
The frequency range from 150kHz to 30MHz is investigated. The scanning waveform please refer to the next page.

4.6 Test Results

PASS.

The frequency range 150kHz to 30MHz is investigated.

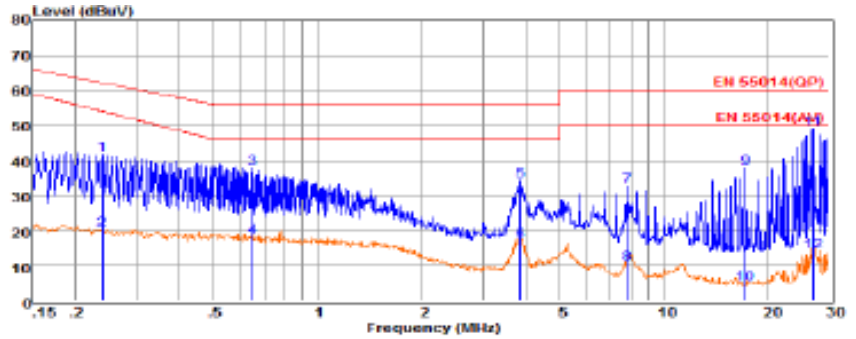
Model No.	OLK-A-03	Test Mode	ON
Environmental Conditions	24.3℃, 55.1% RH	Test Engineer	DM Gu
Pol	Line		



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.25	21.48	9.63	0.03	10.00	41.14	61.78	-20.64	QP
2	0.25	0.58	9.63	0.03	10.00	20.24	53.80	-33.56	Average
3	0.58	18.94	9.63	0.04	10.00	38.61	56.00	-17.39	QP
4	0.58	-1.00	9.63	0.04	10.00	18.67	46.00	-27.33	Average
5	3.80	14.13	9.65	0.06	10.00	33.84	56.00	-22.16	QP
6	3.80	-2.93	9.65	0.06	10.00	16.78	46.00	-29.22	Average
7	8.82	9.34	9.69	0.08	10.00	29.11	60.00	-30.89	QP
8	8.82	-12.26	9.69	0.08	10.00	7.51	50.00	-42.49	Average
9	15.97	17.19	9.72	0.11	10.00	37.02	60.00	-22.98	QP
10	15.97	-14.66	9.72	0.11	10.00	5.23	50.00	-44.77	Average
11	26.84	27.74	9.71	0.13	10.00	47.58	60.00	-12.42	QP
12	26.84	-6.76	9.71	0.13	10.00	13.08	50.00	-36.92	Average

Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

Model No.	OLK-A-03	Test Mode	ON
Environmental Conditions	24.3℃, 55.1% RH	Test Engineer	DM Gu
Pol	Neutral		

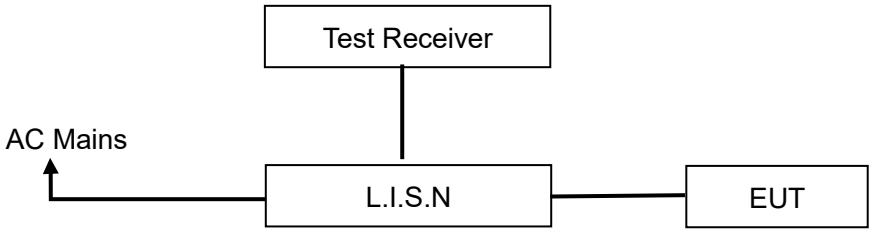


	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.24	22.13	9.60	0.03	10.00	41.76	62.17	-20.41	QP
2	0.24	0.69	9.60	0.03	10.00	20.28	53.02	-33.74	Average
3	0.65	18.23	9.63	0.04	10.00	37.90	56.00	-18.10	QP
4	0.65	-1.47	9.63	0.04	10.00	18.20	46.00	-27.80	Average
5	3.84	14.54	9.65	0.06	10.00	34.25	56.00	-21.75	QP
6	3.84	-2.87	9.65	0.06	10.00	16.84	46.00	-29.16	Average
7	7.81	12.83	9.70	0.07	10.00	32.60	60.00	-27.40	QP
8	7.81	-9.47	9.70	0.07	10.00	10.30	50.00	-39.70	Average
9	17.20	17.83	9.77	0.11	10.00	37.71	60.00	-22.29	QP
10	17.20	-14.98	9.77	0.11	10.00	4.90	50.00	-45.10	Average
11	26.98	29.08	9.83	0.13	10.00	49.04	60.00	-10.96	QP
12	26.98	-6.05	9.83	0.13	10.00	13.91	50.00	-36.09	Average

Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.
2. The emission levels that are 20dB below the official limit are not reported.

5 CLICKS MEASUREMENT

5.1 Block Diagram of Test Setup



5.2 Clicks Measurement Standard and limit

5.2.1.Test Standard
EN 55014-1: 2006+A2: 2011
5.2.2.Test Limit
According to standard EN 55014-1, if click rate (N) less 5/min and the time of this discontinuous disturbances does not exceed 10ms, then the limit value are omitted.

5.3 EUT Configuration on Test

The configuration of EUT is same as Section 2.1.

5.4 Operating Condition of EUT

5.4.1.Setup the EUT as shown Section 5.1.
5.4.2.Turn on the power of all equipments.
5.4.3.After that, let EUT work in test mode (On/Off) and measure it.

5.5 Test Procedure

This test is done when switch operations in thermostatically controlled appliances, automatic program controlled machines and other electrically controlled or operated appliances may generate discontinuous disturbance (Click). The measurement of disturbance shall be performed at the following restricted number of frequencies: 150kHz, 500kHz, 1.4MHz and 30MHz. At each frequency, for appliances which stop automatically, duration of the minimum number of complete programs necessary to produce 40 counted clicks or, where relevant, 40 counted clicks have not been produced, the test is stopped at the end of the program in course. The relevant click rate N. The appliance under test shall be deemed to comply with the limit if not more than a quarter of the number of the counted click registered during the observation time.

5.7 Test Results

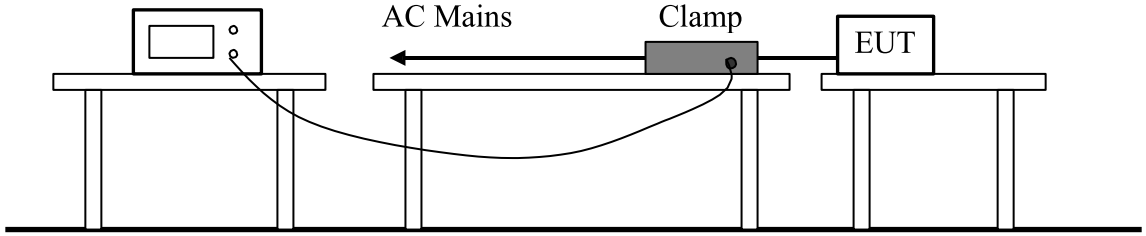
PASS.

The click rate (N=1/2.1=0.48<5) of the EUT is less than 5/min and the time of this discontinuous disturbances (T=4ms<10ms) does not exceed 10ms. According to EN 55014-1, the limit values are omitted.

6. DISTURBANCE POWER MEASUREMENT

6.1.Block Diagram of Test Setup

Test Receiver



6.2.Test Standard

EN 55014-1: 2006+A2: 2011

6.3.Disturbance Power Limits

All emanations from devices or system including any network of conductors and apparatus connected there to, shall not exceed the level of field strengths specified below:

Frequency MHz	Limits dB(pW)	
	Quasi-peak Value	Average Value
30 ~ 300	45 Increasing Linearly with Frequency to 55	35 Increasing Linearly with Frequency to 45

	Household and similar appliances		Tools					
1	2	3	4	5	6	7	8	9
Frequency range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1000 W		Rated motor power above 1000 W	
MHz	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average
Increasing linearly with the frequency from:								
200 to 300	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	
NOTE 1 This table only applies if specified in 4.1.2.3.2. NOTE 2 The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).								

6.4.EUT Configuration on Test

The EN 55014-1 Regulations test method must be used to find the maximum emission during radiated emission measurement. The configuration of the EUT is the same as used in conducted emission measurement.

6.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.4, except the test set up replaced as Section 6.1.

6.6.Test Procedure

The EUT is placed on the plane 0.8m high above the ground by insulating support and away from other metallic surface at least 0.4m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

The bandwidth of the field strength meter is set at 120kHz.

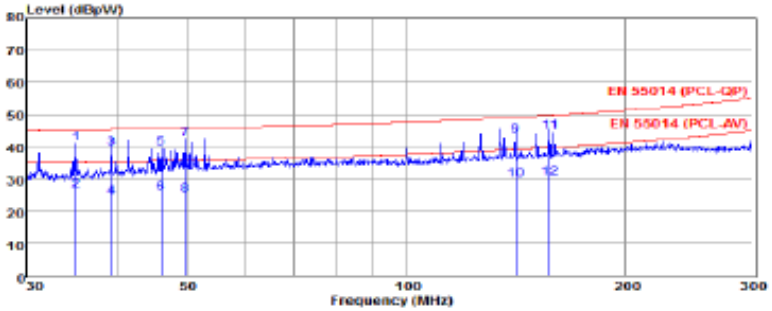
All the test results are listed in Section 6.7.

6.7.Test Results

PASS.

The frequency spectrum from 30 MHz to 300 MHz is investigated.

Model No.	OLK-A-03	Test Mode	ON
Environmental Conditions	24.3℃, 55.1% RH	Detector Function	Quasi-peak
Pol	/	Test Engineer	DM Gu

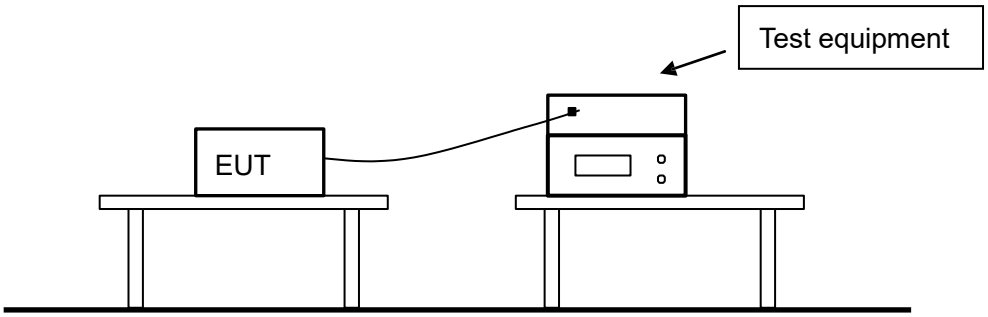


	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	35.06	19.64	-2.48	23.93	41.09	45.20	-4.11	QP
2	35.09	4.91	-2.48	23.93	26.36	35.20	-8.84	Average
3	39.26	17.02	-1.43	23.55	39.54	45.35	-5.81	QP
4	39.28	1.96	-1.43	23.95	24.48	35.35	-10.87	Average
5	46.04	16.30	-0.60	23.98	39.68	45.60	-5.92	QP
6	46.04	2.08	-0.60	23.98	25.46	35.60	-10.14	Average
7	49.79	18.41	0.05	23.99	42.65	45.74	-3.09	QP
8	49.79	0.83	0.05	23.99	24.87	35.74	-10.87	Average
9	141.62	16.39	2.31	24.84	43.44	49.14	-5.70	QP
10	141.62	2.46	2.31	24.84	29.63	39.14	-9.51	Average
11	157.81	16.86	2.78	24.95	44.59	49.74	-5.15	QP
12	157.81	2.75	2.78	24.95	30.48	39.74	-9.26	Average

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

7 HARMONIC CURRENT EMISSION MEASUREMENT

7.1 Block Diagram of Test Setup



7.2 Test Standard

EN 61000-3-2: 2014

7.3 Operation Condition of EUT

Same as Section 4.4, except the test setup replaced as Section 8.1.

7.4 Test Results

PASS.

Please refer to the following pages

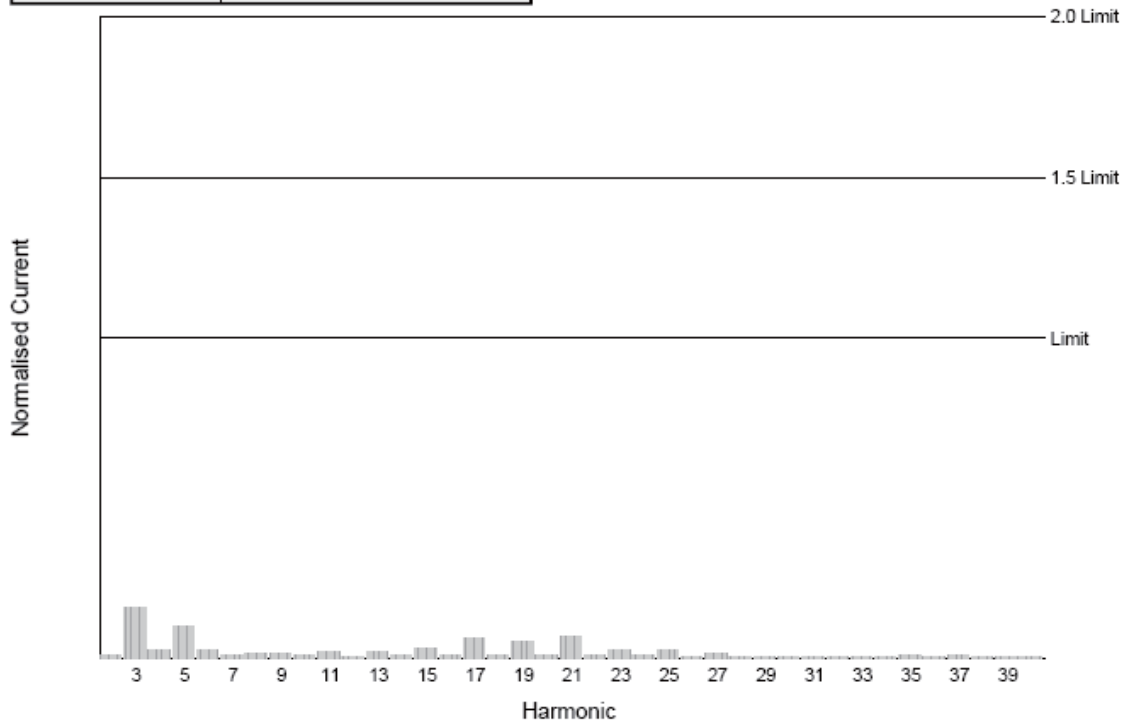
Model No.	OLK-A-03	**Test Engineer**	DM Gu
Harmoinc Results Against Chosen Limits: Pass	**Notes:**		

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	229.0751
Specified Power:	0.0000	806.9688
Fundamental Current:	0.0000	3.4262
Power Factor:	0.0000	0.5191
Average Input Current:		1.4639
Maximum POHC:		0.0084
POHC Limit:		0.2514
Maximum THC:		0.3808
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Overall Result:

PASS

Class	Class A
Class Multiplier	1



Overall Result:	
PASS	

	Nominal	Measured	Deviation	Allowed Deviation	Result
Supply Voltage	230.00V	229.08V	0.92V	4.60V	Pass
Supply Frequency	50.00Hz	49.98Hz	0.02Hz	0.25Hz	Pass
Crest Factor	1.4100	1.4185	0.0085	+/- 0.01	Pass

Harmonic	Reading	Limit	Result	Harmonic	Reading	Limit	Result
2	0.11%	0.20%	Pass	3	0.07%	0.90%	Pass
4	0.05%	0.20%	Pass	5	0.05%	0.40%	Pass
6	0.03%	0.20%	Pass	7	0.06%	0.30%	Pass
8	0.04%	0.20%	Pass	9	0.04%	0.20%	Pass
10	0.02%	0.20%	Pass	11	0.03%	0.10%	Pass
12	0.02%	0.10%	Pass	13	0.01%	0.10%	Pass
14	0.01%	0.10%	Pass	15	0.04%	0.10%	Pass
16	0.01%	0.10%	Pass	17	0.02%	0.10%	Pass
18	0.01%	0.10%	Pass	19	0.02%	0.10%	Pass
20	0.01%	0.10%	Pass	21	0.03%	0.10%	Pass
22	0.01%	0.10%	Pass	23	0.01%	0.10%	Pass
24	0.01%	0.10%	Pass	25	0.02%	0.10%	Pass
26	0.01%	0.10%	Pass	27	0.03%	0.10%	Pass
28	0.01%	0.10%	Pass	29	0.01%	0.10%	Pass
30	0.01%	0.10%	Pass	31	0.01%	0.10%	Pass
32	0.01%	0.10%	Pass	33	0.01%	0.10%	Pass
34	0.01%	0.10%	Pass	35	0.01%	0.10%	Pass
36	0.01%	0.10%	Pass	37	0.03%	0.10%	Pass
38	0.01%	0.10%	Pass	39	0.03%	0.10%	Pass
40	0.01%	0.10%	Pass				

Overall Result:	
PASS	

Class	Class A
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	1.0800A	1.6200A	9.915mA	✓ ✓	14.22mA	✓	Pass	3	2.3000A	3.4500A	355.5mA	✓ ✓	362.2mA	✓	Pass
4	430.0mA	645.0mA	9.850mA	✓ ✓	12.17mA	✓	Pass	5	1.1400A	1.7100A	115.0mA	✓ ✓	117.3mA	✓	Pass
6	300.0mA	450.0mA	7.169mA	N/A	8.209mA	N/A	N/A	7	770.0mA	1.1550A	8.675mA	N/A	10.40mA	✓	Pass
8	230.0mA	345.0mA	3.428mA	N/A	4.076mA	N/A	N/A	9	400.0mA	600.0mA	5.380mA	N/A	6.535mA	N/A	N/A
10	184.0mA	276.0mA	1.541mA	N/A	1.783mA	N/A	N/A	11	330.0mA	495.0mA	6.868mA	N/A	7.392mA	N/A	N/A
12	153.3mA	230.0mA	1.067mA	N/A	1.207mA	N/A	N/A	13	210.0mA	315.0mA	4.792mA	N/A	5.087mA	N/A	N/A
14	131.4mA	197.1mA	1.214mA	N/A	1.489mA	N/A	N/A	15	150.0mA	225.0mA	5.034mA	N/A	5.261mA	N/A	N/A
16	115.0mA	172.5mA	1.040mA	N/A	1.217mA	N/A	N/A	17	132.3mA	198.5mA	8.546mA	N/A	8.731mA	N/A	N/A
18	102.2mA	153.3mA	0.907mA	N/A	1.058mA	N/A	N/A	19	118.4mA	177.6mA	6.319mA	N/A	6.388mA	N/A	N/A
20	92.00mA	138.0mA	0.979mA	N/A	1.132mA	N/A	N/A	21	107.1mA	160.7mA	7.015mA	N/A	7.259mA	N/A	N/A
22	83.63mA	125.4mA	0.790mA	N/A	0.929mA	N/A	N/A	23	97.82mA	146.7mA	2.634mA	N/A	2.773mA	N/A	N/A
24	76.66mA	115.0mA	0.654mA	N/A	0.760mA	N/A	N/A	25	90.00mA	135.0mA	2.579mA	N/A	2.679mA	N/A	N/A
26	70.76mA	106.1mA	0.409mA	N/A	0.477mA	N/A	N/A	27	83.33mA	125.0mA	1.197mA	N/A	1.293mA	N/A	N/A
28	65.71mA	98.57mA	0.435mA	N/A	0.515mA	N/A	N/A	29	77.58mA	116.3mA	0.504mA	N/A	0.561mA	N/A	N/A
30	61.33mA	92.00mA	0.309mA	N/A	0.356mA	N/A	N/A	31	72.58mA	108.8mA	0.606mA	N/A	0.646mA	N/A	N/A
32	57.50mA	86.25mA	0.322mA	N/A	0.377mA	N/A	N/A	33	68.18mA	102.2mA	0.429mA	N/A	0.488mA	N/A	N/A
34	54.11mA	81.17mA	0.277mA	N/A	0.328mA	N/A	N/A	35	64.28mA	96.42mA	0.755mA	N/A	0.797mA	N/A	N/A
36	51.11mA	76.66mA	0.259mA	N/A	0.302mA	N/A	N/A	37	60.81mA	91.21mA	0.668mA	N/A	0.723mA	N/A	N/A
38	48.42mA	72.63mA	0.255mA	N/A	0.296mA	N/A	N/A	39	57.69mA	86.53mA	0.418mA	N/A	0.468mA	N/A	N/A
40	46.00mA	69.00mA	0.233mA	N/A	0.266mA	N/A	N/A								

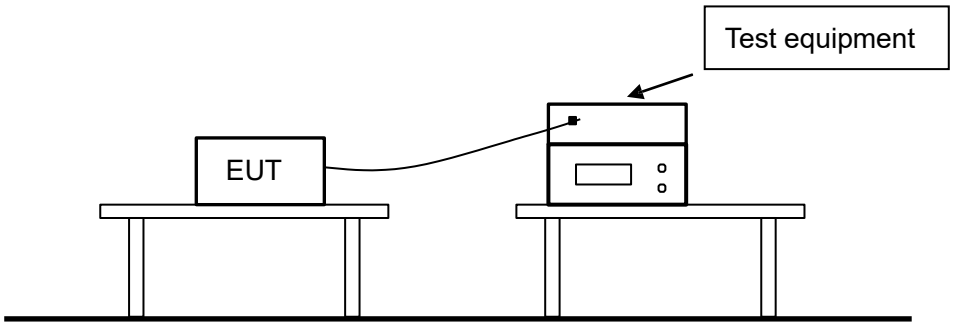
<L1 : Reading is below limit 1.

<L2 : Reading is below limit 2.

N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.

8 VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

8.1 Block Diagram of Test Setup



8.2 Measuring Standard

EN 61000-3-3: 2013

8.3 Operation Condition of EUT

8.3.1.Setup the EUT as shown Section 8.1.
8.3.2.Turn on the power of all equipments.
8.3.3.Let EUT work in test mode (On/Off) and measure it.

8.4 Test Results

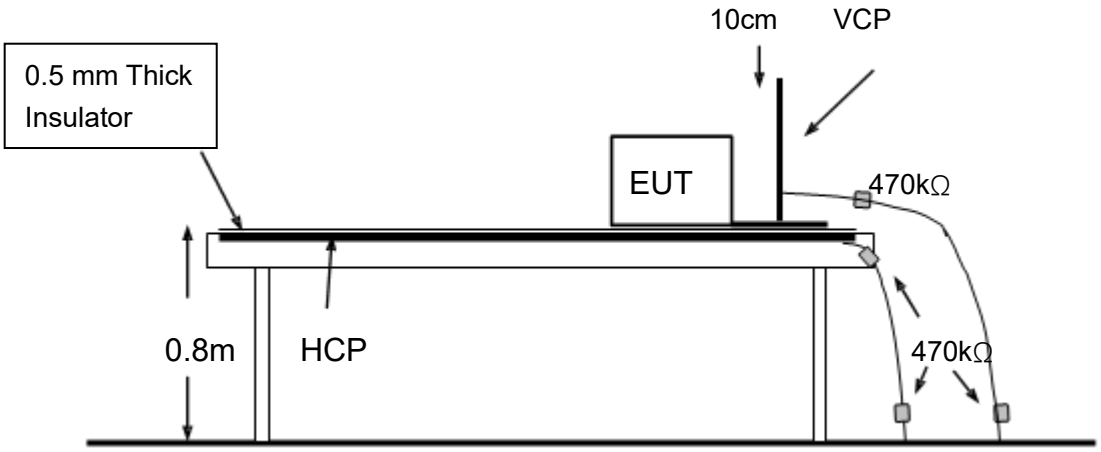
PASS

Model No.	OLK-A-03	Test Engineer	DM Gu
Over Result:	Notes:		
PASS	Measurement method - voltage		

	Pst	dc (%)	dmax(%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.117	0.101	0.696	0

9 ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1 Block Diagram of Test Setup



9.2 Test Standard

EN 55014-2: 2015
(EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge: ± 8KV, Level: 2 / Contact Discharge: ±4KV)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

9.3.2 Performance Criterion: B

9.4 EUT Configuration on Test

The configuration of EUT is listed in Section 4.3.

9.5 Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.4. Except the test set up replaced by Section 10.1.

9.6 Test Procedure

9.6.1 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

9.6.2 Contact Discharge

All the procedure shall be same as Section 10.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.6.3 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.

9.6.4 Indirect Discharge For Vertical Coupling Plane

At least 10 single discharge (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.

9.7 Test Results

PASS.

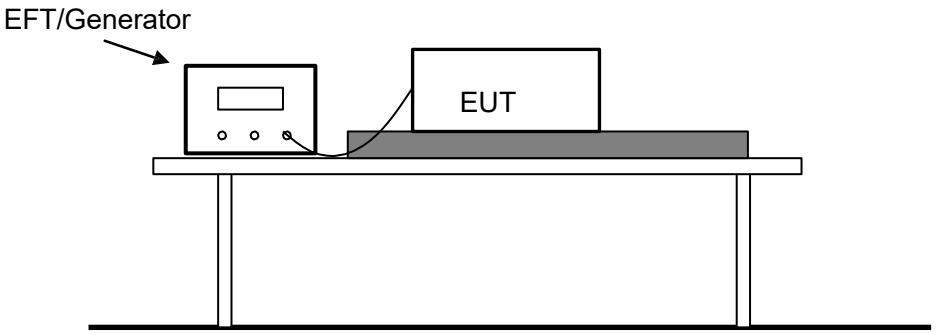
Please refer to the following pages

Electrostatic Discharge Test Results			
Standard	EN 61000-4-2		
Applicant	ZHEJIANG WOWTECH M&E PRODUCTS CO., LTD.		
EUT	OZONE AIR PURIFIER	**Temperature**	24.2℃
MODEL	OLK-A-03	**Humidity**	55%
Criterion	B	**Pressure**	1021mbar
Test Mode	ON	**Test Engineer**	Davey Xu

Air Discharge						
	Test Levels			**Results**		
Test Points	±2KV	±4KV	±8KV	Passed	Fail	Performance Criterion
Front	■	■	■	■	□	B
Back	■	■	■	■	□	B
Left	■	■	■	■	□	B
Right	■	■	■	■	□	B
Top	■	■	■	■	□	B
Bottom	■	■	■	■	□	B
Contact Discharge						
	Test Levels			**Results**		
Test Points	±2KV	±4KV		Passed	Fail	Performance Criterion
Front	■	■		■	□	B
Back	■	■		■	□	B
Left	■	■		■	□	B
Right	■	■		■	□	B
Top	■	■		■	□	B
Bottom	■	■		■	□	B
Discharge To Horizontal Coupling Plane						
	Test Levels			**Results**		
Side of EUT	±2KV	±4KV		Passed	Fail	Performance Criterion
Front	■	■		■	□	B
Back	■	■		■	□	B
Left	■	■		■	□	B
Right	■	■		■	□	B
Discharge To Vertical Coupling Plane						
	Test Levels			**Results**		
Side of EUT	±2KV	±6KV		Passed	Fail	Performance Criterion
Front	■	■		■	□	B
Back	■	■		■	□	B
Left	■	■		■	□	B
Right	■	■		■	□	B

10 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

10.1 Block Diagram of Test Setup



10.2 Test Standard

EN 55014-2(EN 61000-4-4: 2012, Severity Level, Level 3: 2KV)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

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

10.3.2 Performance Criterion: B

10.4.EUT Configuration on Test

The configuration of EUT is listed in Section 3.9

10.5 Operating Condition of EUT

10.5.1 Setup the EUT as shown in Section 10.1.
10.5.2 Turn on the power of all equipment.
10.5.3 Let the EUT work in test mode (ON) and measure it.

10.6 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.

10.6.1 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.

10.6.2 For signal lines and control lines ports: No I/O ports. It's unnecessary to test.

10.6.3 For DC output line ports: It's unnecessary to test.

10.7 Test Results

PASS.

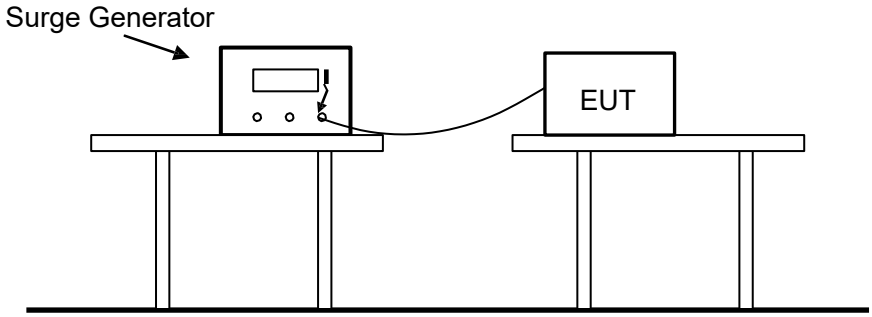
Please refer to the following page.

Electrical Fast Transient/Burst Test Results			
Standard	EN 61000-4-4		
Applicant	ZHEJIANG WOWTECH M&E PRODUCTS CO., LTD.		
EUT	OZONE AIR PURIFIER	**Temperature**	24.3℃
MODEL	OLK-A-03	**Humidity**	55.4%
Test Mode	ON	**Criterion**	B
Test Engineer			

Line	**Test Voltage**	**Result (+)**	**Result (-)**
L	2KV	PASS	PASS
N	2KV	PASS	PASS
PE			
L-N	2KV	PASS	PASS
L-PE			
N-PE			
L-N-PE	2KV	PASS	PASS
Signal Line			
I/O Cable			
Note:			

11 SURGE IMMUNITY TEST

11.1Block Diagram of Test Setup



11.2 Test Standard

EN 55014-2: 2015
(EN 61000-4-5: 2014, Severity Level: Level 2, Line to Line: 1.0KV; Level 3 Line to Ground: 1.0KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Severity Level	Open-Circuit Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

11.3.2 Performance Criterion: B

11.4.EUT Configuration on Test

The configuration of EUT is listed in Section 4.3

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 12.1.

11.5.2 Turn on the power of all equipment.

11.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

11.6.1 Set up the EUT and test generator as shown on Section 10.1.

11.6.2 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.

11.6.3.At least 5 positive and 5 negative (polarity) tests with a maximum 1/min

repetition rate are conducted during test

11.6.4.Different phase angles are done individually.

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

11.7 Test Results

PASS.

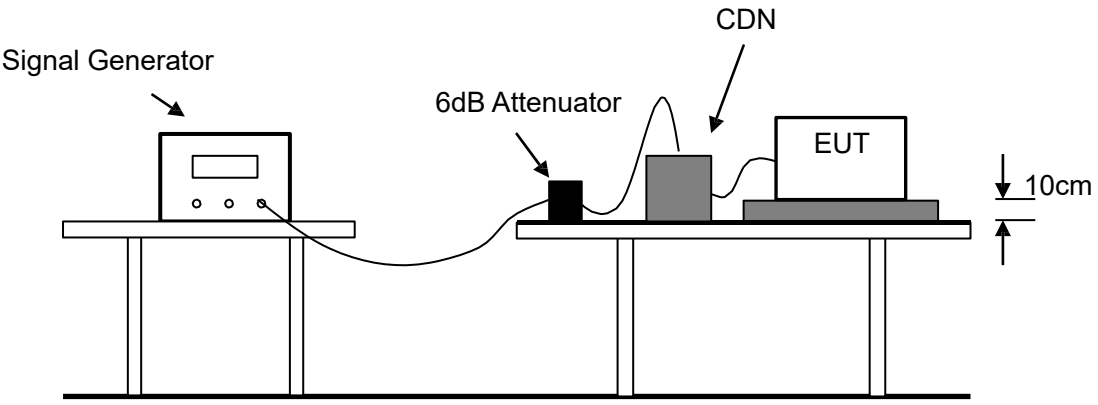
Please refer to the following page.

Surge Immunity Test Result			
Standard	EN 61000-4-5		
Applicant	ZHEJIANG WOWTECH M&E PRODUCTS CO., LTD.		
EUT	OZONE AIR PURIFIER	**Temperature**	24.3℃
MODEL	OLK-A-03	**Humidity**	55.4%
Test Mode	ON	**Criterion**	B
Test Engineer	DM Gu		

Location	**Polarity**	**Phase Angle**	**Number of Pulse**	**Pulse Voltage (KV)**	**Result**
L-N	+	0º	5	1.0	PASS
	+	90º	5	1.0	PASS
	+	180º	5	1.0	PASS
	+	270º	5	1.0	PASS
	-	0º	5	1.0	PASS
	-	90º	5	1.0	PASS
	-	180º	5	1.0	PASS
	-	270º	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

12 INJECTED CURRENTS SUSCEPTIBILITY TEST

12.1 Block Diagram of Test Setup



12.2 Test Standard

EN 55014-2: 2015
(EN 61000-4-6: 2014, Severity Level: 3V (rms), (0.15MHz ~ 230MHz))

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Level	Field Strength (V)
1	1
2	3
3	10
X	Special

12.3.2 Performance Criterion: A

12.4 EUT Configuration on Test

The configuration of EUT is listed in Section 4.3

12.5 Operating Condition of EUT

12.5.1 Setup the EUT as shown in Section 12.1.

12.5.2 Turn on the power of all equipment.

12.5.3 Let the EUT work in test mode (ON) and measure it.

12.6 Test Procedure

12.6.1 Set up the EUT, CDN and test generators as shown on Section 12.1.

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

12.6.3 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).

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

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

12.6.6 The frequency range is swept from 150kHz to80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

12.6.7 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.

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

12.7 Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results			
Standard	EN 61000-4-6		
Applicant	ZHEJIANG WOWTECH M&E PRODUCTS CO., LTD.		
EUT	OZONE AIR PURIFIER	**Temperature**	24.3℃
MODEL	OLK-A-03	**Humidity**	55.4%
Test Mode	ON	**Criterion**	A
Test Engineer	DM Gu		

Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 230	AC Mains	3V	A	PASS

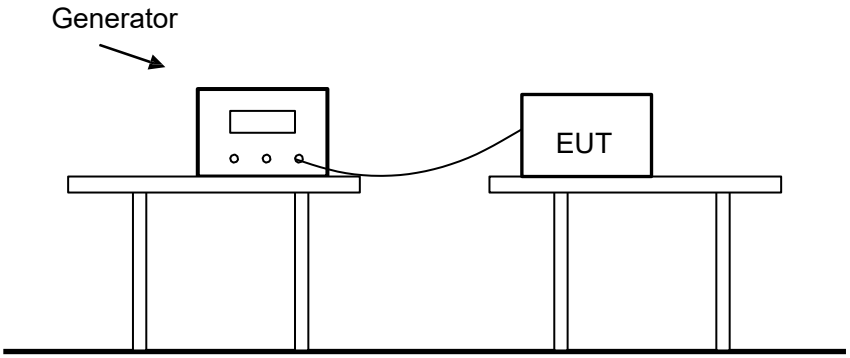
Remark:
1. Modulation Signal:1kHz 80% AM
2. Measurement Equipment :

Simulator: CIT-10 (FRANKONIA)
CDN : ■CDN-M2 (FRANKONIA)
CDN-M3 (FRANKONIA)

Note:

13 VOLTAGE DIPS AND INTERRUPTIONS TEST

13.1 Block Diagram of Test Setup



13.2 Test Standard

EN 55014-2: 2015 (EN 61000-4-11: 2004)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

Test Level (%UT)	Voltage dip and short interruptions (%UT)	Duration (in period)	
0	100	0.5	0.5
40	60	10	12
70	30	25	30

13.3.2 Performance Criterion: C&C

13.4 EUT Configuration on Test

The configuration of EUT is listed in Section 4.3

13.5 Operating Condition of EUT

13.5.1 Setup the EUT as shown in Section 13.1.

13.5.2 Turn on the power of all equipment.

13.5.3 Let the EUT work in test mode (ON) and measure it.

13.6 Test Procedure

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

13.6.2 The interruptions are introduced at selected phase angles with specified duration.

13.6.3 Record any degradation of performance.

13.7 Test Results

PASS.

Please refer to the following page.

Voltage Dips And Interruptions Test Result			
Standard	EN 61000-4-11		
Applicant	ZHEJIANG WOWTECH M&E PRODUCTS CO., LTD.		
EUT	OZONE AIR PURIFIER	**Temperature**	24.3℃
MODEL	OLK-A-03	**Humidity**	55.4%
Test Mode	ON	**Criterion**	B&C
Test Engineer	DM Gu		

Test Level % U^T	**Voltage Dips & Short Interruptions % U^T**	**Duration (in periods)**		**Criterion**	**Result**
		50Hz	**60Hz**		
40	60	10P	12P	C	PASS
70	30	25P	30P	C	PASS
0	100	0.5P	0.5P	C	PASS
Note:					

14. EXTERNAL AND INTERNAL PHOTOS OF THE EUT







----------THE END OF TEST REPORT----------