中国认可
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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTZ19F10072240E
Applicant	:	
Address	:	
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	Tower Fan
Model No.	:	Refer to section 3.2
Standards	:	EN 55014-1:2017 EN 55014-2:2015 EN 61000-3-2:2014 EN 61000-3-3:2013
Date of Receipt sample	:	2017-12-12
Date of Test	:	2018-01-02 to 2018-01-29
Date of Issue	:	2019-10-25
Test Report Form No.	:	WEH-55014A-01B
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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1 Test Summary

EMISSION			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	EN 55014-1:2017	Clause 4.3.3	Pass
Disturbance Power, 30MHz to 300MHz	EN 55014-1:2017	Clause 4.3.4	Pass
Discontinuous Disturbance (Click)	EN 55014-1:2017	Clause 4.4	N/A**
Radiated Emission, 30MHz to 1000MHz	EN 55014-1:2017	Clause 4.3.4	N/A
Harmonic Current emission	EN 61000-3-2:2014	Class A	Pass***
Voltage Fluctuation and Flicker	EN 61000-3-3:2013	Clause 5	Pass

IMMUNITY (EN 55014-2:2015)				
Test Item	**Test Method**	**Class / Severity**	**Performance Criteria**	**Result**
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±8 kV Air	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4:2012	AC ±1.0kV DC ±0.5kV	B	Pass
Surge	IEC 61000-4-5:2005	±1kV D.M.† ±2kV C.M.‡	B	Pass
Injected Currents, 0.15MHz to 230MHz	IEC 61000-4-6:2013	3Vr.m.s.(emf), 80%, 1kHz Amp. Mod.	A	Pass
Voltage Dips and Interruptions	IEC 61000-4-11:2004	0 % U_T * for 0.5per	C	Pass
		40 % U_T * for 10per		Pass
		70 % U_T * for 25per		Pass

Remark:

Pass	Test item meets the requirement
Fail	Test item does not meet the requirement
N/A	Test case does not apply to the test object
A.M	Amplitude Modulation
†	Differential Mode
‡	Common Mode
*	U_T is the nominal supply voltage
**	According to the electrical characteristics and usage of the equipment, the EUT does not produce discontinuous radio interference voltages on AC Mains. Therefore this test item has been skipped.
***	According to EN61000-3-2 which states:'' For the following categories of equipment limits are not specified in this edition of the standard. Equipment with a rated power of 75W or less, other than lighting equipment" Therefore there is no need for harmonics test to be performed on this product and deemed to fulfil emission requirements without testing.

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Name ..... : Tower Fan

Model No. ..... : Refer to section 3.2

Remark..... : All models have same electric circuit only their motor, model name and appearance are different. Therefore the full EMC tests were performed on model YF-TO3605 and YF-TO3612L. Model YF-TO2903 has no electronic circuits, so only tested CE, DP and Flicker.

3.2 Details of E.U.T.

Technical Data..... :

Item	Model	Voltage	Power
1	YF-TO2901,TF-29C1,YF-TO2902,TF-29C2, YF-TO2903,YF-TO2904,YF-TO2905, YF-TO2906,YF-TO2907,YF-TO2908,YF-TO2909, TF-29B, TF-29B1,TF-29R,YF-TO2910, YF-TO2911, YF-TO2912,YF-TO2913, YF-TO2914,YF-TO3201,YF-TO3202, YF-TO3203,YF-TO3204,YF-TO3205, YF-TO3206,YF-TO3207,YF-TO3208, YF-TO3209,YF-TO3210,YF-TO3211,YF-TO3212, YF-TO3212L,YF-TO3212D,YF-TO3213, YF-TO3214,YF-TO3614,YF-TO3601, YF-TO3602,YF-TO3603,YF-TO3605, YF-TO3606,YF-TO3607,YF-TO3610, YF-TO3611,YF-TO3612, YF-TO3612L,YF-TO3612D,YF-TO4605, YF-TO4607	AC 220-240V, 50/60Hz	45W

3.3 Description of Support Units

The EUT has been tested as an independent unit. YF-TO2903, YF-TO3605, YF-TO3612L are test samples. The DV,DP&Click tests were performed in the condition of AC264V/50Hz input. The other tests were performed in the condition of AC230V/50Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55014-1:2017	Electromagnetic compatibility-Requirements for household appliances, electric tools and similar apparatus-Part 1:Emission
EN 55014-2:2015	Electromagnetic compatibility Requirements for household appliances, Part 2: Immunity Product family.
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Services (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science an Economic Development Canada(ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number:21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Services (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test items:---

Lab information:---

3.7 Abnormalities from Standard Conditions

None.

3.8 Other

This report is based on report No. WTD17S1297855E for updating standard, the updated standard does not affect the EMC test items. Therefore the EUT is deemed to fulfill all the requirements and no further test has been performed.

4 Equipment Used during Test

Mains Terminal Disturbance Voltage (Conducted Emission)					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2.	LISN	R&S	ENV216	101215	Valid
3.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Valid
4.	Cable	HUBER+SUHNER	CBL2-NN-3M	2230300	Valid
5.	Switch	ESE	RSU/M2	---	Valid
Disturbance Power					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2.	Absorbing Clamp	LUTHI	MDS21	4067	Valid
3.	Cable	HUBER+SUHNER	CBL2-NN-9M	2230900	Valid
4.	Switch	ESE	RSU/M2	---	Valid
Harmonics and Flicker Measuring System					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	Harmonics and Flicker Measuring System	TESEQ	CCN1000-1	1133A01498	Valid
ESD					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	ESD Simulator	TESEQ	NSG437	521	Valid
Radio-frequency electromagnetic fields					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	RF Power Amplifier	OPHIR	5225R	1051/1712	Valid
2.	RF Power Amplifier	OPHIR	5293RE	1051/171	Valid
3.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	STLP 9128E	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	STLP 9149 #476	Valid
5.	RF signal generator	Agilent	N5181A	MY48080720	Valid
6.	Power meter	RS	NRP6A	101133	Valid
7.	Power meter	RS	NRP6A	101134	Valid
8.	Electric field probe	Narda S.T.S/PMM	EP 601	---	Valid
EFT & Voltage Dips and Interruptions					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	EMS test system	TESEQ	NSG3040	0319	Valid
2.	Clamp	TESEQ	CDN8014	31405	Valid

Surge					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	Surge Simulator	TESEQ	NSG3060	1395	Valid
Injected Currents					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	Conducted Immunity test system	TESEQ	NSG4070-75	31469	Valid
2.	CDN	TESEQ	M016	31586	Valid
3.	Clamp	TESEQ	KEMZ801	32362	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Disturbance Power	30MHz~300MHz	±3.21dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Emission Test Results

5.1 Mains Terminals Disturbance Voltage, 150kHz to 30MHz

Test Requirement..... : EN 55014-1

Test Method..... : EN 55014-1

Test Result..... : Pass

Frequency Range..... : 150kHz to 30MHz

Class/Severity..... : Table 5 of EN55014-1

5.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.2°C

Humidity..... : 53.3%RH

Atmospheric Pressure..... : 101.2kPa

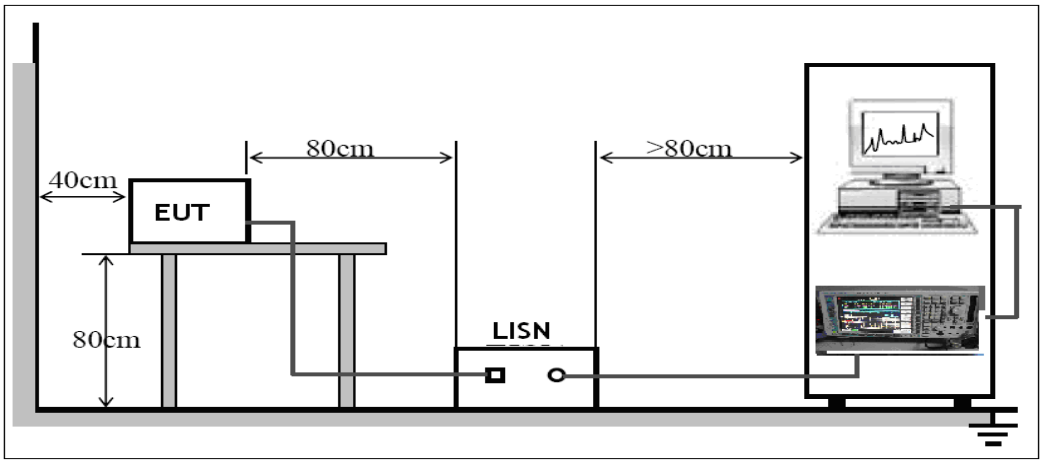
EUT Operation:

Input Voltage ..... : AC 264V/50Hz

Operating Mode..... : High speed + Normal wind + Swing(the worst case mode)

5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the EN 55014-1.

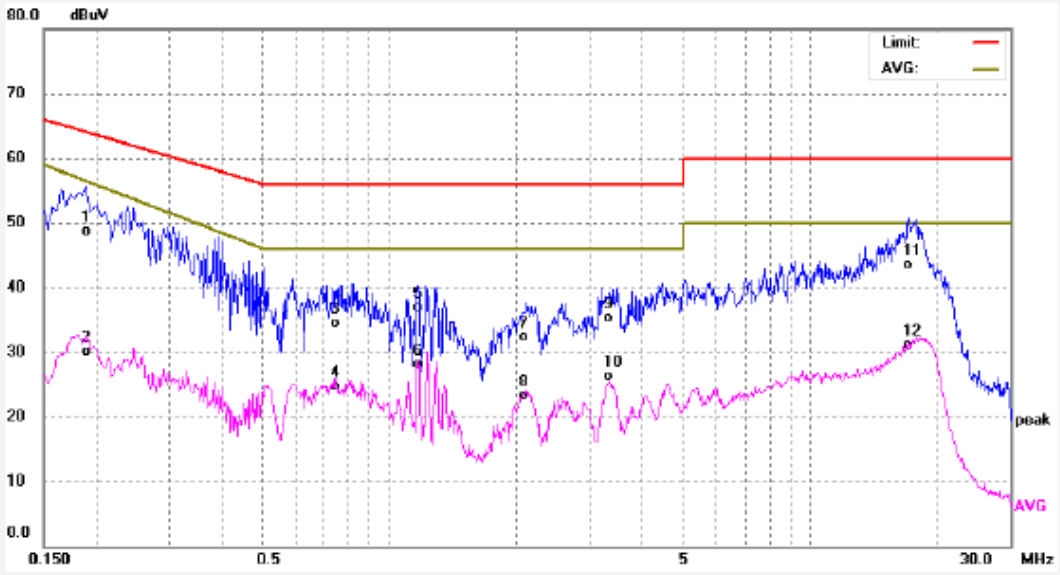


5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

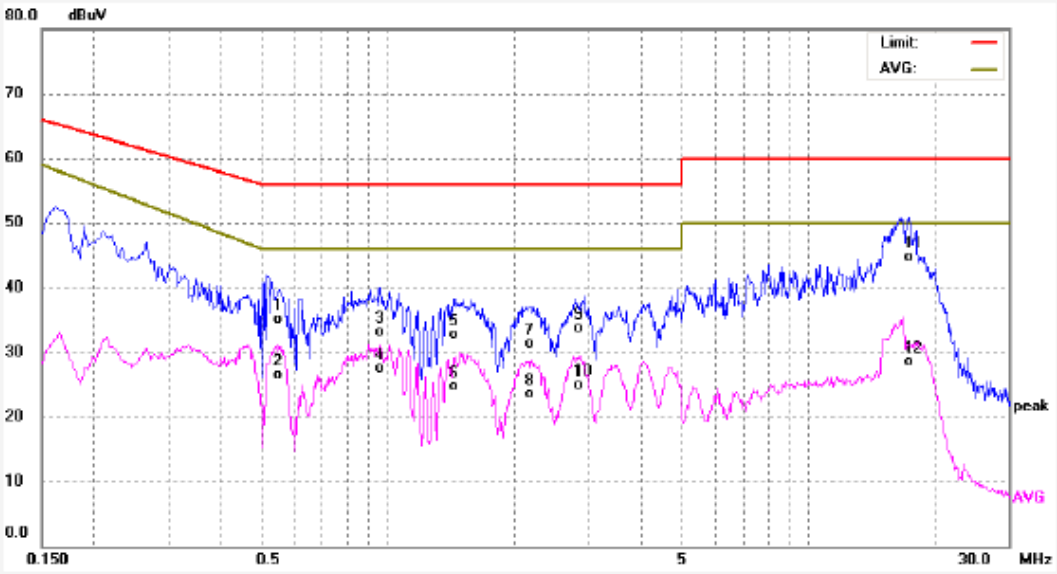
5.1.4 Mains Terminals Disturbance Voltage Test Data

Live Line (Model YF-TO3612L) :



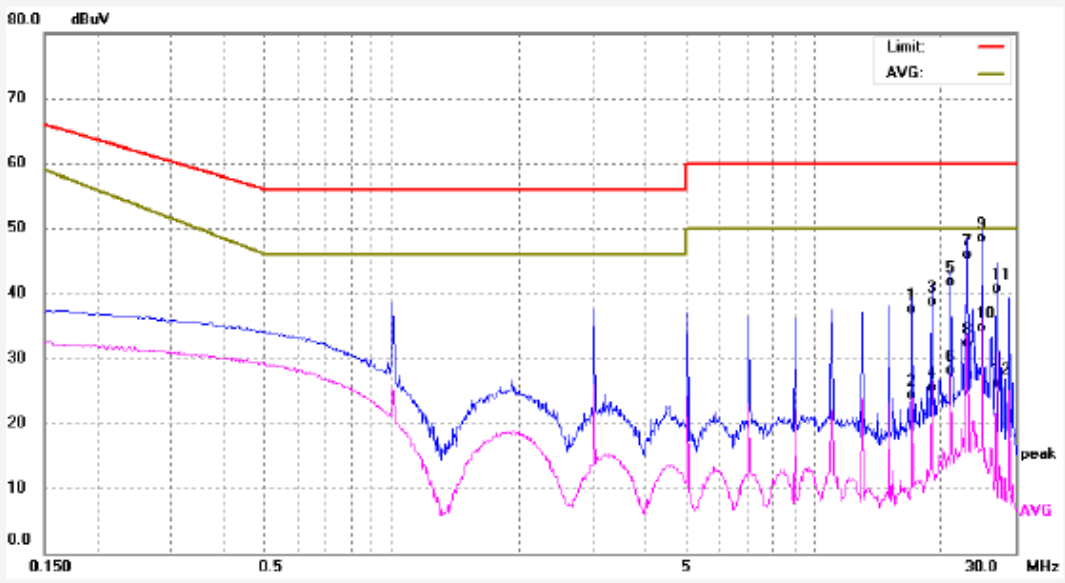
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1900	39.04	9.63	48.67	64.03	-15.36	QP	
2	0.1900	20.40	9.63	30.03	56.44	-26.41	AVG	
3	0.7460	24.80	9.75	34.55	56.00	-21.45	QP	
4	0.7460	15.02	9.75	24.77	46.00	-21.23	AVG	
5	1.1700	26.95	9.86	36.81	56.00	-19.19	QP	
6	1.1700	18.24	9.86	28.10	46.00	-17.90	AVG	
7	2.1099	22.29	9.95	32.24	56.00	-23.76	QP	
8	2.1099	13.44	9.95	23.39	46.00	-22.61	AVG	
9	3.3220	25.47	9.93	35.40	56.00	-20.60	QP	
10	3.3220	16.32	9.93	26.25	46.00	-19.75	AVG	
11	17.1299	33.30	10.28	43.58	60.00	-16.42	QP	
12	17.1299	20.75	10.28	31.03	50.00	-18.97	AVG	

Neutral Line (Model YF-TO3612L):



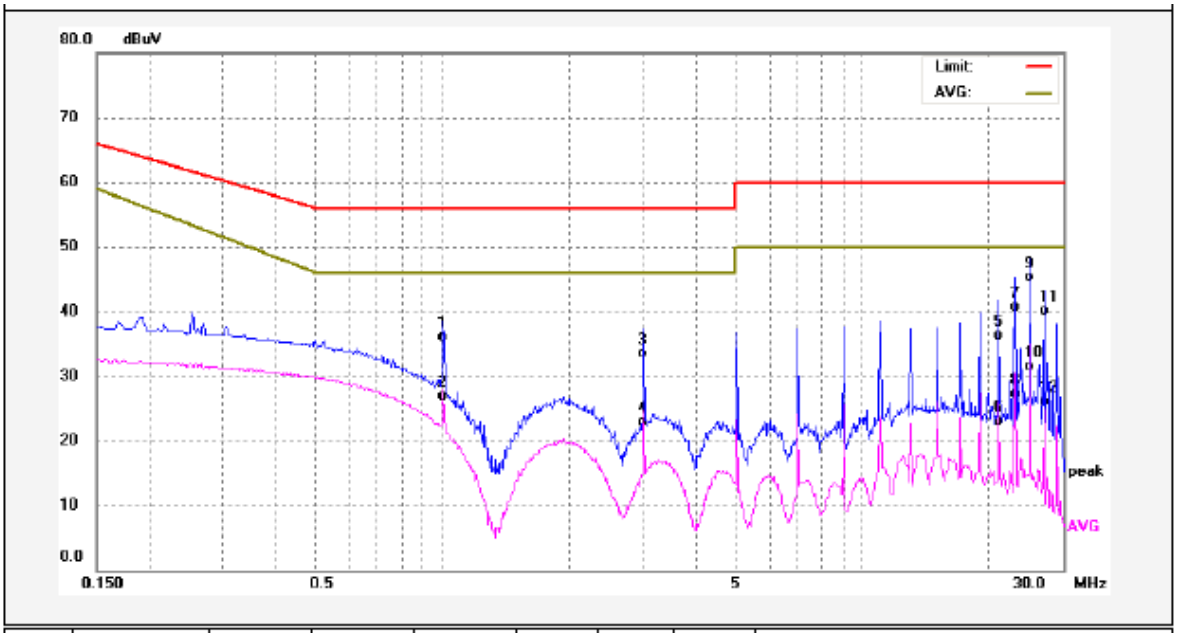
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5540	25.45	9.69	35.14	56.00	-20.86	QP	
2	0.5540	16.76	9.69	26.45	46.00	-19.55	AVG	
3	0.9620	23.34	9.81	33.15	56.00	-22.85	QP	
4	0.9620	17.70	9.81	27.51	46.00	-18.49	AVG	
5	1.4540	22.74	9.90	32.64	56.00	-23.36	QP	
6	1.4540	14.82	9.90	24.72	46.00	-21.28	AVG	
7	2.1820	21.29	9.95	31.24	56.00	-24.76	QP	
8	2.1820	13.59	9.95	23.54	46.00	-22.46	AVG	
9	2.8100	23.86	9.93	33.79	56.00	-22.21	QP	
10	2.8100	15.04	9.93	24.97	46.00	-21.03	AVG	
11	17.3500	34.47	10.29	44.76	60.00	-15.24	QP	
12	17.3500	18.24	10.29	28.53	50.00	-21.47	AVG	

Live Line (Model YF-TO3605) :



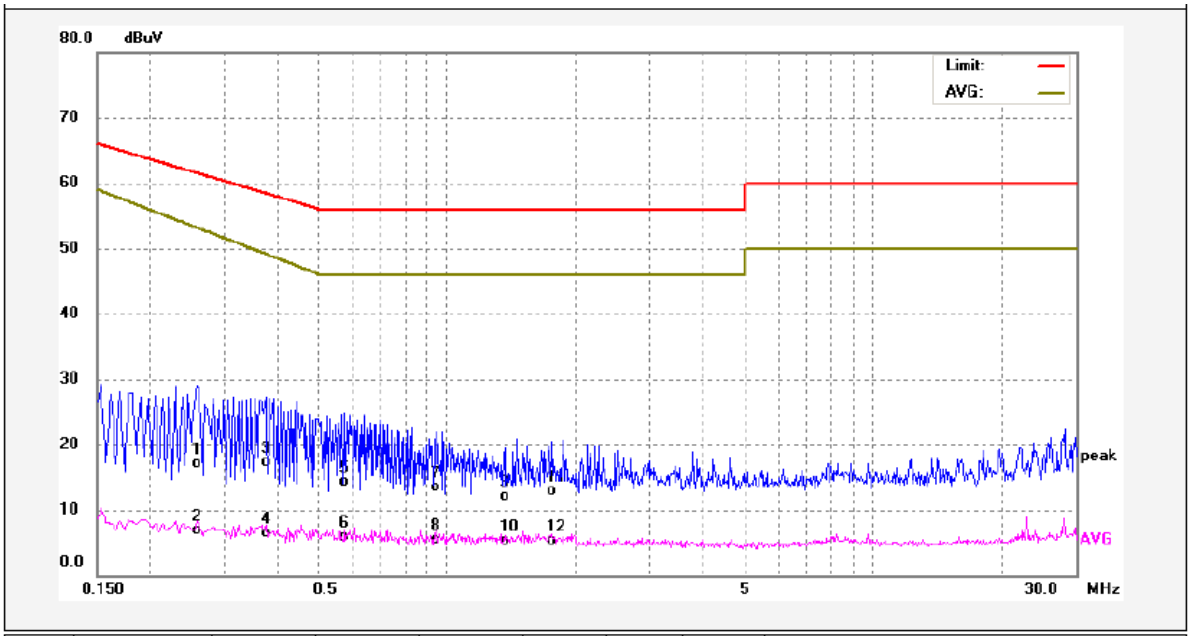
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	17.0300	27.16	10.28	37.44	60.00	-22.56	QP	
2	17.0300	13.94	10.28	24.22	50.00	-25.78	AVG	
3	19.0300	28.30	10.32	38.62	60.00	-21.38	QP	
4	19.0300	15.18	10.32	25.50	50.00	-24.50	AVG	
5	21.0340	31.43	10.35	41.78	60.00	-18.22	QP	
6	21.0340	17.83	10.35	28.18	50.00	-21.82	AVG	
7	23.0380	35.61	10.37	45.98	60.00	-14.02	QP	
8	23.0380	21.96	10.37	32.33	50.00	-17.67	AVG	
9	25.0419	38.16	10.39	48.55	60.00	-11.45	QP	
10	25.0419	24.40	10.39	34.79	50.00	-15.21	AVG	
11	27.0420	30.31	10.41	40.72	60.00	-19.28	QP	
12	27.0420	15.78	10.41	26.19	50.00	-23.81	AVG	

Neutral Line (Model YF-TO3605):



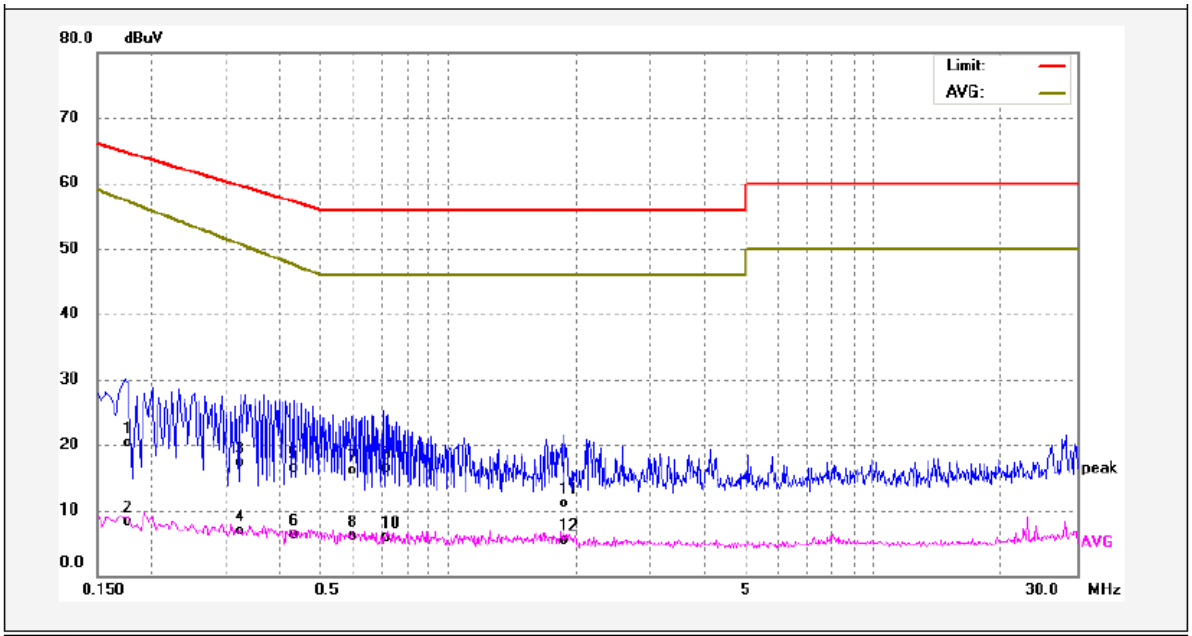
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	1.0020	26.31	9.83	36.14	56.00	-19.86	QP	
2	1.0020	17.04	9.83	26.87	46.00	-19.13	AVG	
3	3.0020	23.64	9.93	33.57	56.00	-22.43	QP	
4	3.0020	13.00	9.93	22.93	46.00	-23.07	AVG	
5	21.0300	25.99	10.35	36.34	60.00	-23.66	QP	
6	21.0300	12.73	10.35	23.08	50.00	-26.92	AVG	
7	23.0340	30.40	10.37	40.77	60.00	-19.23	QP	
8	23.0340	16.94	10.37	27.31	50.00	-22.69	AVG	
9	25.0380	34.86	10.39	45.25	60.00	-14.75	QP	
10	25.0380	21.20	10.39	31.59	50.00	-18.41	AVG	
11	27.0420	29.74	10.41	40.15	60.00	-19.85	QP	
12	27.0420	15.68	10.41	26.09	50.00	-23.91	AVG	

Live Line (Model YF-TO2903) :



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2580	7.49	9.64	17.13	61.49	-44.36	QP	
2	0.2580	-2.65	9.64	6.99	53.14	-46.15	AVG	
3	0.3740	7.63	9.63	17.26	58.41	-41.15	QP	
4	0.3740	-3.21	9.63	6.42	49.13	-42.71	AVG	
5	0.5740	4.61	9.70	14.31	56.00	-41.69	QP	
6	0.5740	-3.74	9.70	5.96	46.00	-40.04	AVG	
7	0.9420	3.79	9.81	13.60	56.00	-42.40	QP	
8	0.9420	-4.24	9.81	5.57	46.00	-40.43	AVG	
9	1.3660	2.15	9.89	12.04	56.00	-43.96	QP	
10	1.3660	-4.52	9.89	5.37	46.00	-40.63	AVG	
11	1.7660	2.93	9.93	12.86	56.00	-43.14	QP	
12	1.7660	-4.61	9.93	5.32	46.00	-40.68	AVG	

Neutral Line (Model YF-TO2903):



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1768	10.69	9.64	20.33	64.63	-44.30	QP	
2	0.1768	-1.33	9.64	8.31	57.22	-48.91	AVG	
3	0.3260	7.67	9.63	17.30	59.55	-42.25	QP	
4	0.3260	-2.78	9.63	6.85	50.62	-43.77	AVG	
5	0.4340	6.77	9.64	16.41	57.18	-40.77	QP	
6	0.4340	-3.25	9.64	6.39	47.53	-41.14	AVG	
7	0.6020	6.46	9.72	16.18	56.00	-39.82	QP	
8	0.6020	-3.71	9.72	6.01	46.00	-39.99	AVG	
9	0.7100	6.70	9.73	16.43	56.00	-39.57	QP	
10	0.7100	-3.85	9.73	5.88	46.00	-40.12	AVG	
11	1.8740	1.17	9.94	11.11	56.00	-44.89	QP	
12	1.8740	-4.34	9.94	5.60	46.00	-40.40	AVG	

5.2 Disturbance Power, 30MHz to 300MHz

Test Requirement..... : EN 55014-1

Test Method..... : EN 55014-1

Test Result..... : Pass

Frequency Range..... : 30MHz to 300MHz

Class/Severity..... : Table 7,8 of EN55014-1

5.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23.1°C

Humidity..... : 52.9%RH

Barometric Pressure..... : 101.3kPa

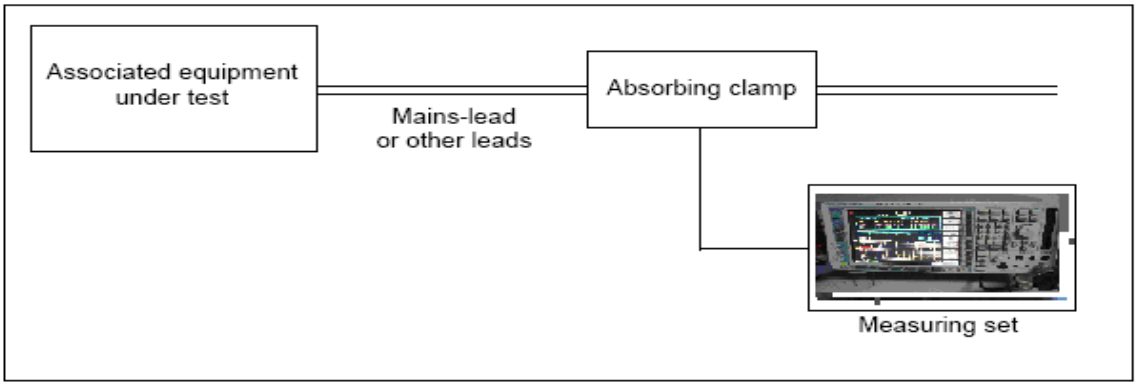
EUT Operation:

Input Voltage ..... : AC 264V/50Hz

Operating Mode..... : High speed + Normal wind + Swing(the worst case mode)

5.2.2 Block Diagram of Test Setup

The Disturbance Power test was performed in accordance with the EN 55014-1.

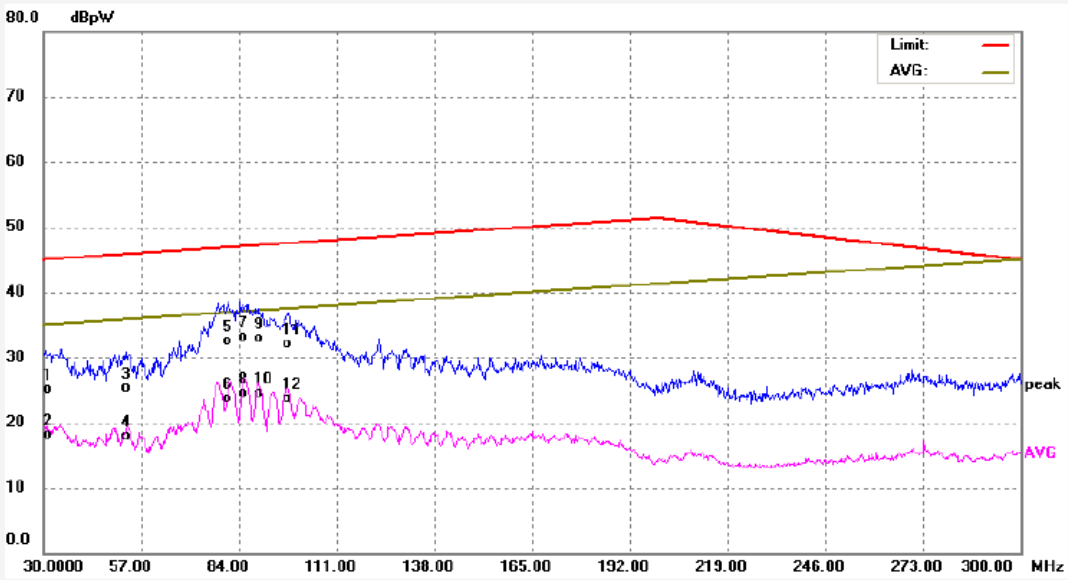


5.2.3 Measurement Data

Extending the cable to 6 meters, performed quasi-peak & average measurements since peak emissions from the EUT were detected within 15dB of the limit line. Average measurements were only performed if the quasi-peak measurements were within 15dB of the average limit line.
According to the Clause 4.3.4.2, if both of the following conditions (1) and (2) are fulfilled: 1) all emission readings from the equipment under test shall be lower than the applicable limits (Table 7) reduced by the margin (Table 8); 2) the maximum clock frequency shall be less than 30 MHz. The Appliances are deemed to comply in the frequency range from 300 MHz to 1 000 MHz

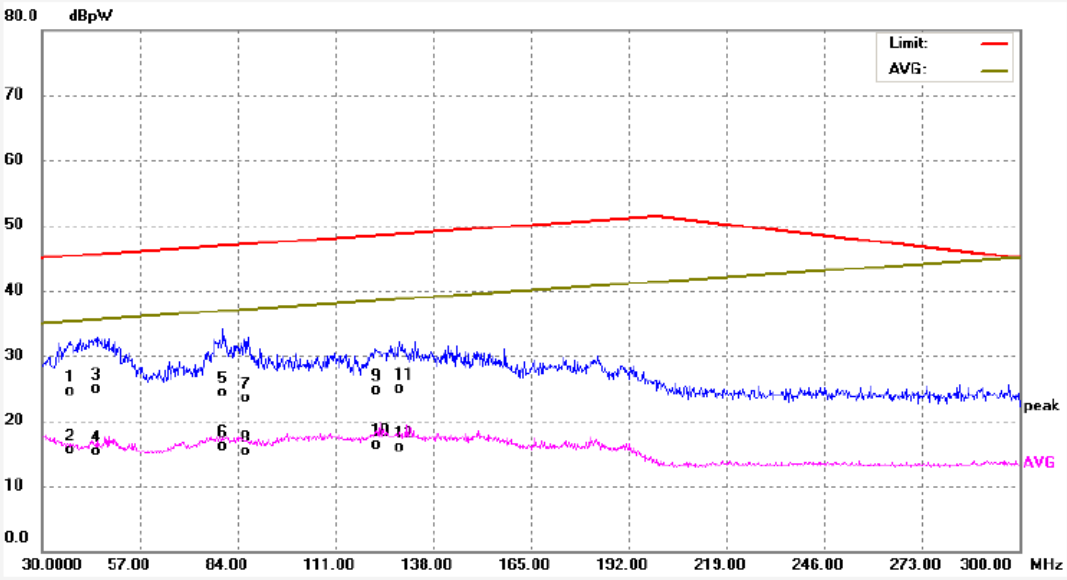
5.2.4 Disturbance Power Test Results on AC Line

Model YF-TO3612L



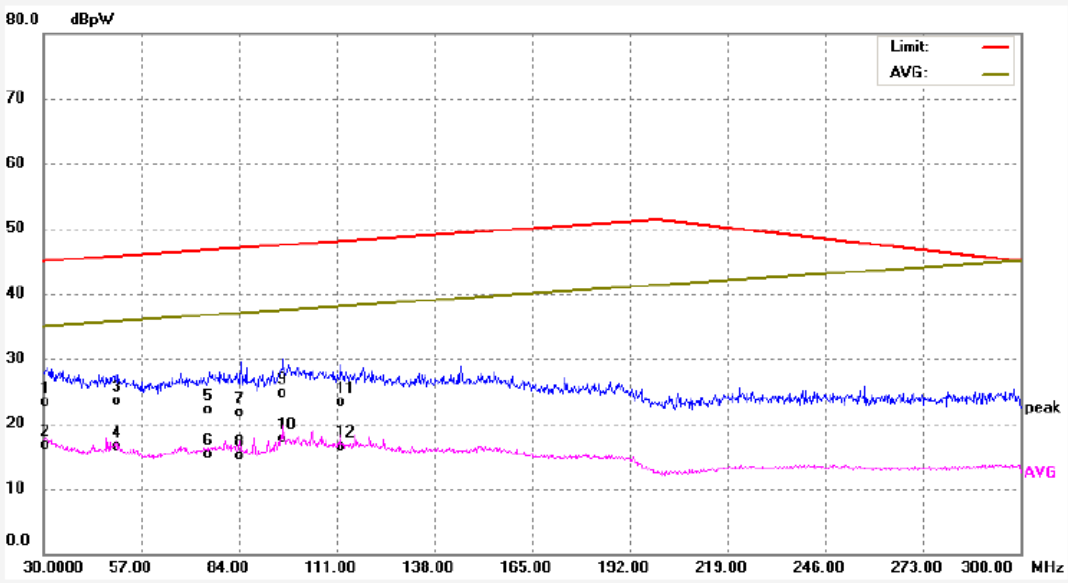
No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Margin (dB)	Detector	Remark
1	30.6000	16.07	8.99	25.06	45.02	-19.96	QP	
2	30.6000	9.07	8.99	18.06	35.02	-16.96	AVG	
3	52.9440	18.32	7.02	25.34	45.85	-20.51	QP	
4	52.9440	10.90	7.02	17.92	35.85	-17.93	AVG	
5	81.4640	24.51	8.07	32.58	46.91	-14.33	QP	
6	81.4640	15.73	8.07	23.80	36.91	-13.11	AVG	
7	85.8600	25.47	7.67	33.14	47.07	-13.93	QP	
8	85.8600	16.90	7.67	24.57	37.07	-12.50	AVG	
9	89.4440	25.62	7.35	32.97	47.20	-14.23	QP	
10	89.4440	17.13	7.35	24.48	37.20	-12.72	AVG	
11	97.5320	23.85	8.20	32.05	47.50	-15.45	QP	
12	97.5320	15.56	8.20	23.76	37.50	-13.74	AVG	

Model YF-TO3605



No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Margin (dB)	Detector	Remark
1	37.5839	16.64	7.79	24.43	45.28	-20.85	QP	
2	37.5839	7.68	7.79	15.47	35.28	-19.81	AVG	
3	45.6120	17.57	7.29	24.86	45.58	-20.72	QP	
4	45.6120	8.07	7.29	15.36	35.58	-20.22	AVG	
5	80.0560	16.15	8.19	24.34	46.85	-22.51	QP	
6	80.0560	7.94	8.19	16.13	36.85	-20.72	AVG	
7	86.9840	15.86	7.57	23.43	47.11	-23.68	QP	
8	86.9840	7.79	7.57	15.36	37.11	-21.75	AVG	
9	121.9160	16.20	8.41	24.61	48.41	-23.80	QP	
10	121.9160	7.85	8.41	16.26	38.41	-22.15	AVG	
11	128.8679	16.71	8.10	24.81	48.66	-23.85	QP	
12	128.8679	7.76	8.10	15.86	38.66	-22.80	AVG	

Model YF-TO2903



No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Margin (dB)	Detector	Remark
1	30.8560	14.34	8.95	23.29	45.03	-21.74	QP	
2	30.8560	7.68	8.95	16.63	35.03	-18.40	AVG	
3	50.4640	16.43	7.17	23.60	45.76	-22.16	QP	
4	50.4640	9.41	7.17	16.58	35.76	-19.18	AVG	
5	76.0320	14.16	7.92	22.08	46.71	-24.63	QP	
6	76.0320	7.47	7.92	15.39	36.71	-21.32	AVG	
7	84.6600	13.98	7.78	21.76	47.03	-25.27	QP	
8	84.6600	7.35	7.78	15.13	37.03	-21.90	AVG	
9	96.1679	16.57	8.04	24.61	47.45	-22.84	QP	
10	96.1679	9.66	8.04	17.70	37.45	-19.75	AVG	
11	112.1960	14.71	8.58	23.29	48.05	-24.76	QP	
12	112.1960	7.89	8.58	16.47	38.05	-21.58	AVG	

5.3 Voltage Fluctuation and Flicker

Test Requirement ..... : EN 61000-3-3

Test Method ..... : EN 61000-3-3

Test Result ..... : Pass

5.3.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23.1°C

Humidity..... : 53.4%RH

Barometric Pressure..... : 101.4kPa

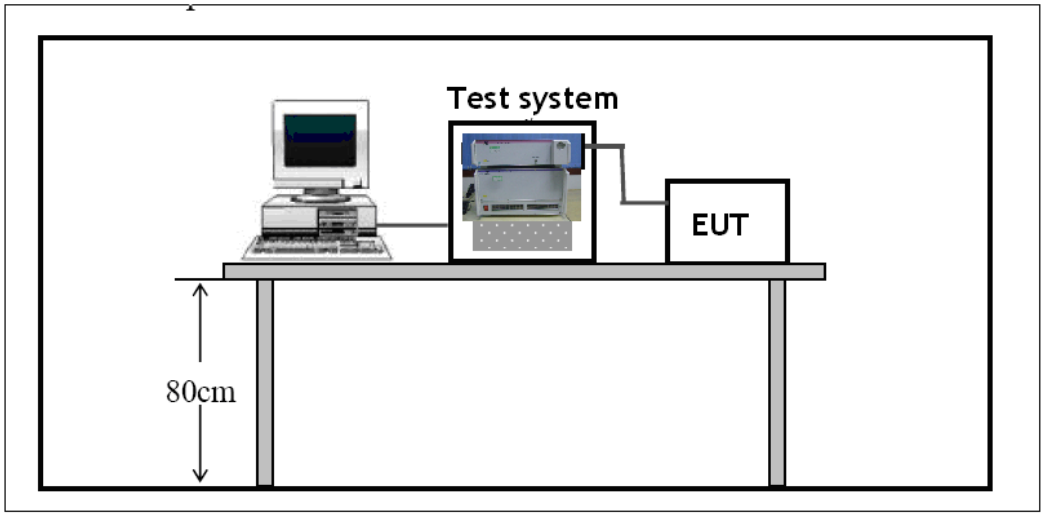
EUT Operation:

Input Voltage ..... : AC 230V/50Hz

Operating Mode..... : High speed + Normal wind + Swing(the worst case mode)

5.3.2 Block Diagram of Setup

The Voltage Fluctuation and Flicker test was performed in accordance with the EN 61000-3-3.



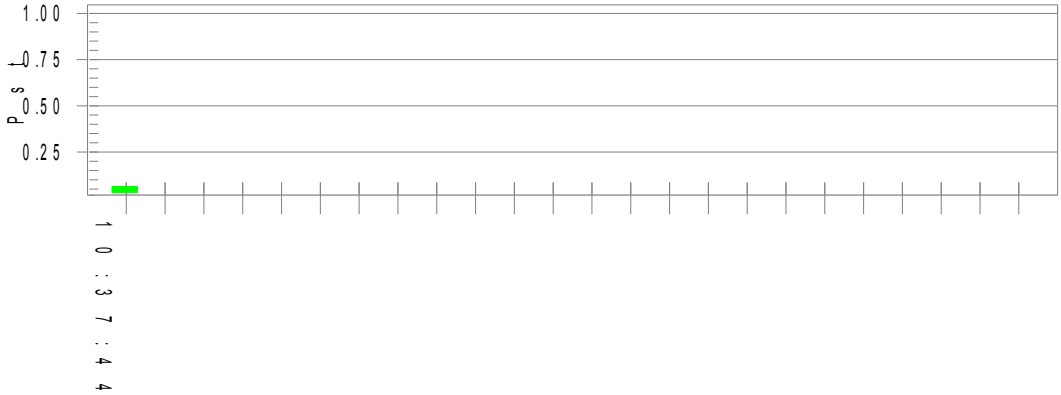
5.3.3 Voltage Fluctuation and Flicker Test Data

Model YF-TO3612L
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Tower fan **Tested by: WJ**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2018/1/6 **Start time: 10:27:23** **End time: 10:37:50**
Test duration (min): 10 **Data file name: F-000152.cts_data**
Comment: High speed + Normal wind + swing
Customer: YF-TO3612L

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

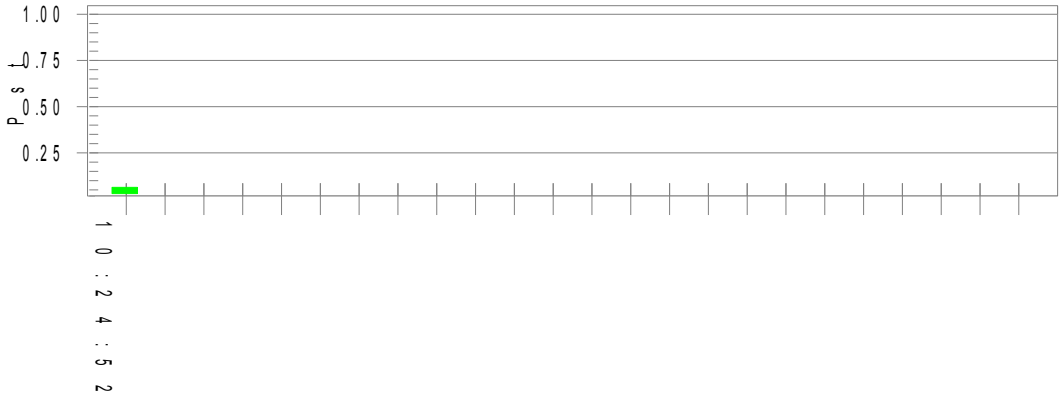
Vrms at the end of test (Volt):	**229.72**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

Model YF-TO3605
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Tower fan **Tested by: WJ**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2018/1/6 **Start time: 10:14:31** **End time: 10:24:59**
Test duration (min): 10 **Data file name: F-000151.cts_data**
Comment: High speed + Normal wind + swing
Customer: YF-TO3605

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

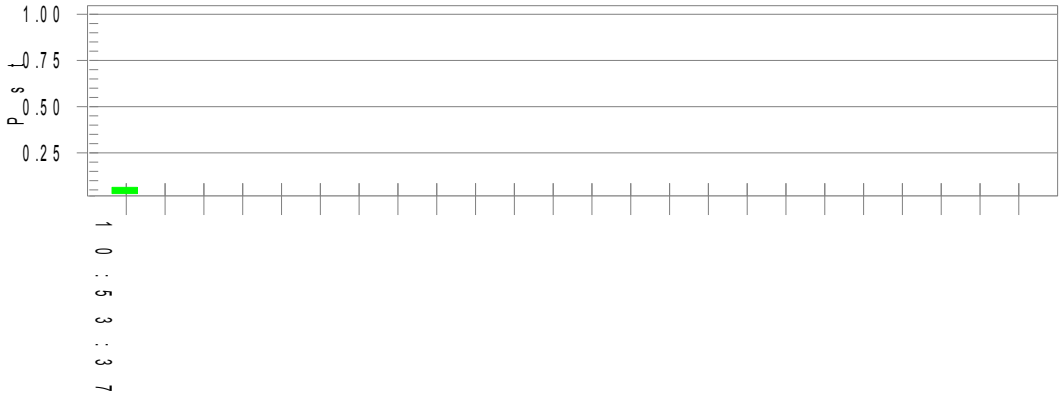
Vrms at the end of test (Volt):	**229.84**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

Model YF-TO2903
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Tower fan **Tested by: WJ**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2018/1/6 **Start time: 10:43:16** **End time: 10:53:44**
Test duration (min): 10 **Data file name: F-000153.cts_data**
Comment: High speed + Normal wind + swing
Customer: YF-TO2903

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.79**			
Highest dt (%):	**0.00**	**Test limit (%):**	**N/A**	**N/A**
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**

6 Immunity Test Results

6.1 Performance Criteria

Performance criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. 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 from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self- recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use. For further details, please refer to EN 55014-2.

6.2 Electrostatic Discharge (ESD)

Test Requirement.....	:	EN 55014-2
Test Method.....	:	IEC 61000-4-2
Test Result.....	:	Pass
Discharge Impedance.....	:	330Ω / 150pF
Discharge Voltage.....	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
Polarity.....	:	Positive & Negative
Number of Discharge.....	:	Minimum 10 times at each test point
Discharge Mode	:	Single Discharge
Discharge Period.....	:	1 second minimum

6.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 22.7°C

Humidity ..... : 53.4%RH

Barometric Pressure ..... : 101.8kPa

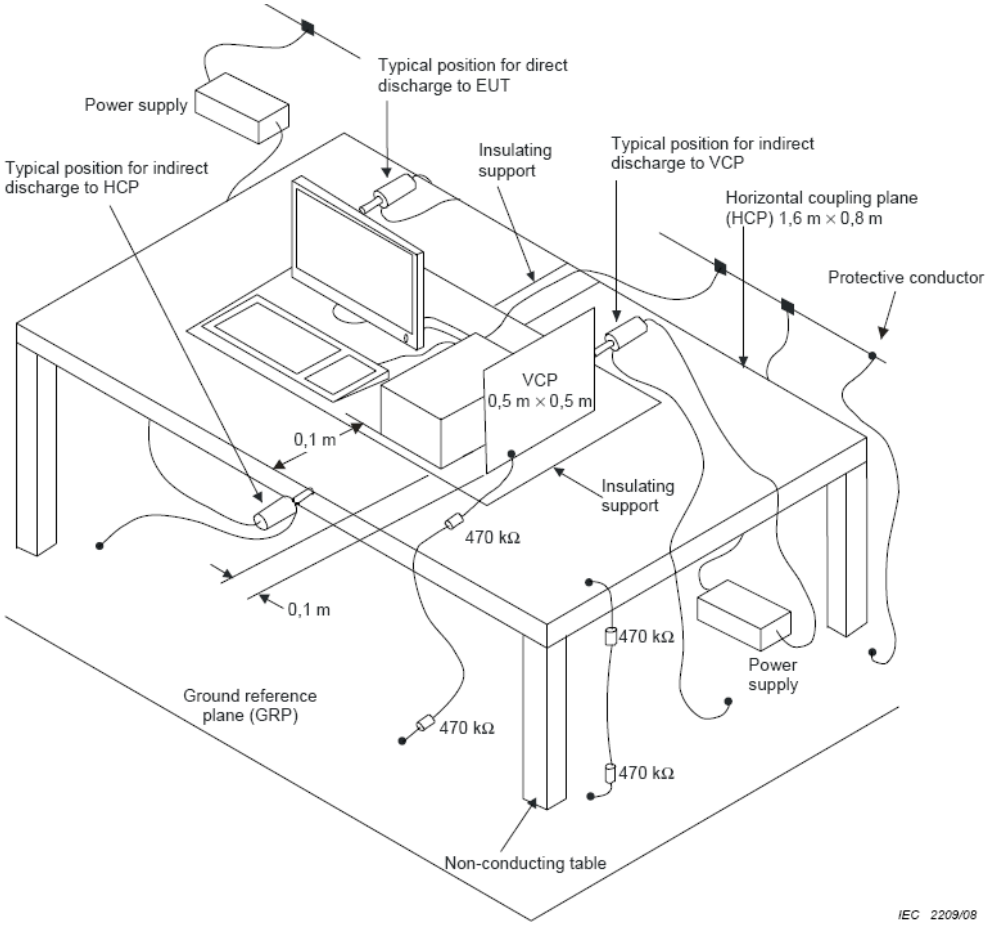
EUT Operation:

Input Voltage..... : AC 230V/50Hz

Operating Mode ..... : High speed + Normal wind + Swing(the worst case mode)

6.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.



6.2.3 Direct Discharge Test Results

Observations: **Test points:** **1. All Exposed Surface & Seams;**
2. All metallic part

Direct Discharge			Test Results	
Applied Voltage (kV)	**Performance Criterion**	**Test Point**	**Contact Discharge**	**Air Discharge**
±8	B	1	N/A	Pass*
±4	B	2	Pass*	N/A

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.2.4 Indirect Discharge Test Results

Observations: **Test points:** **1. All sides.**

Indirect Discharge			Test Results	
Applied Voltage (kV)	**Performance Criterion**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
±4	B	1	Pass*	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.3 Radio-Frequency Electromagnetic Fields, 80MHz to 1GHz

Test Requirement ..... : EN 55014-2:2015

Test Method ..... : IEC 61000-4-3:2010

Test Result ..... : Pass

Frequency Range ..... : 80MHz to 1GHz

Test level ..... : 3V/m

Modulation ..... : 80%, 1kHz Amplitude Modulation.

Face of EUT ..... : Front, Back, Left, Right

Antenna polarisation ..... : Horizontal & Vertical

6.3.1E.U.T. Operation

Operating Environment:

Temperature ..... : 22.4°C

Humidity ..... : 51% RH

Barometric Pressure ..... : 102.7kPa

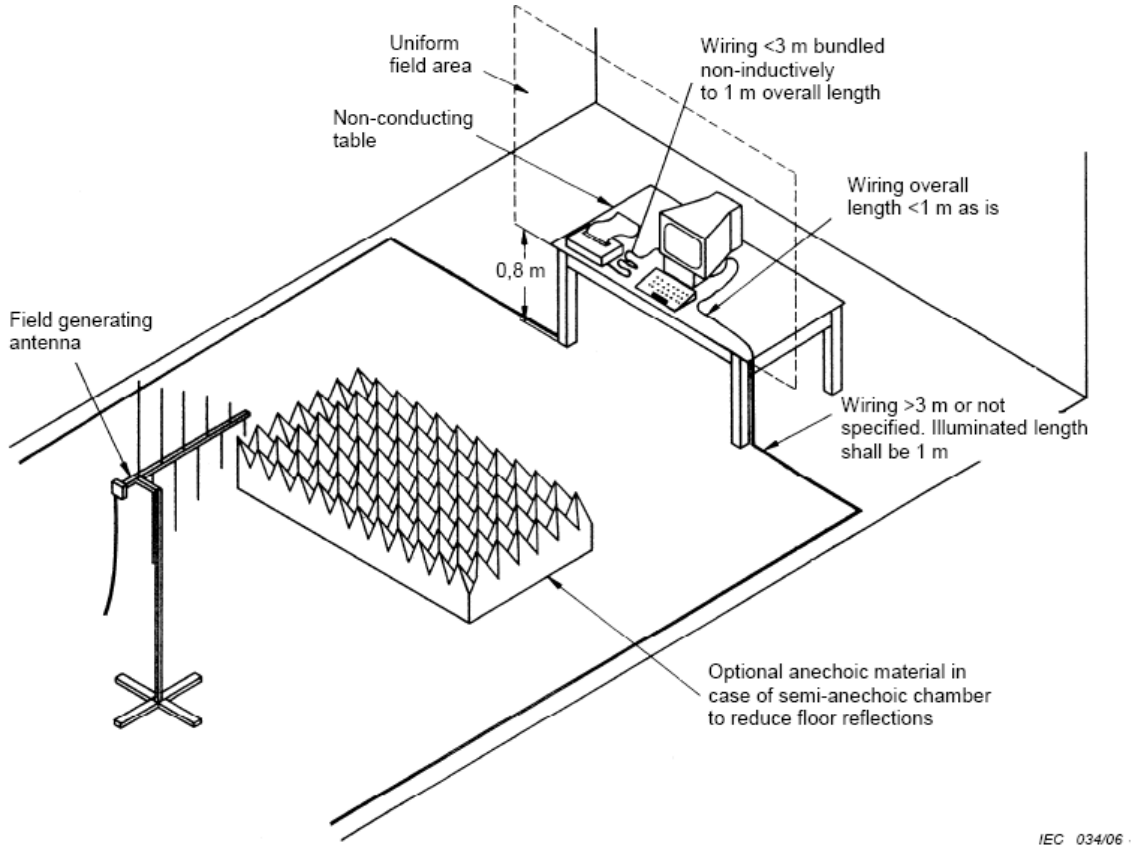
EUT Operation:

Input Voltage ..... : AC 230V/50Hz

Operating Mode ..... : High speed + Normal wind + Swing(the worst case mode)

6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.



6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.4 Electrical Fast Transients (EFT)

Test Requirement.....	:	EN 55014-2
Test Method.....	:	IEC 61000-4-4
Test Result.....	:	Pass
Test Level	:	1.0kV on AC Mains
Polarity.....	:	Positive & Negative
Repetition Frequency	:	5kHz
Burst Duration.....	:	300ms
Test Duration.....	:	2 minutes per level & polarity

6.4.1E.U.T. Operation

Operating Environment:

Temperature ..... : 23.2°C

Humidity..... : 53.5%RH

Barometric Pressure..... : 101.9kPa

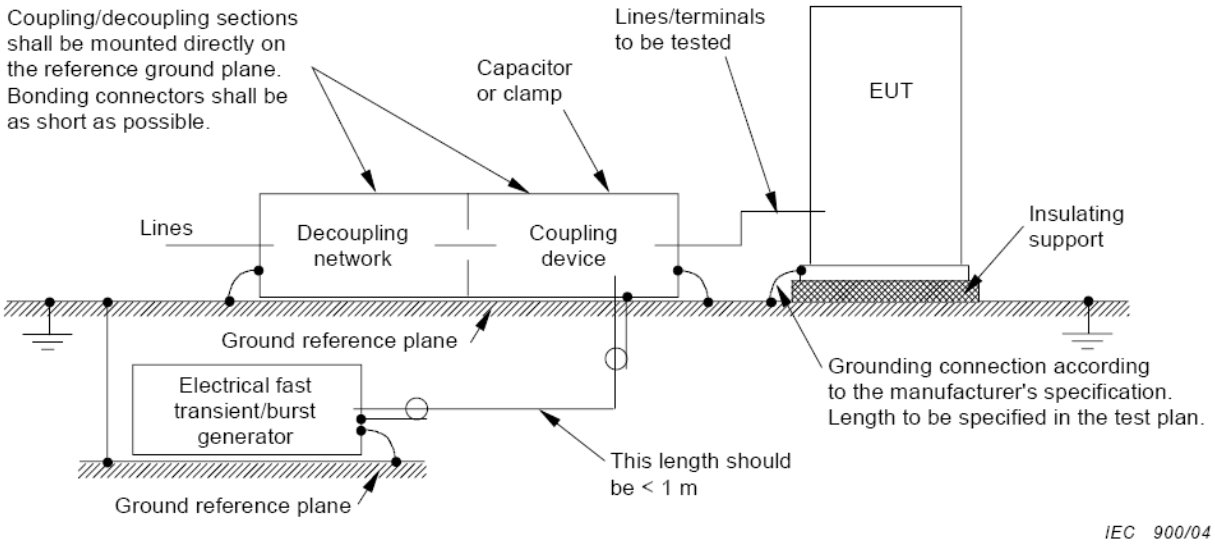
EUT Operation:

Input Voltage ..... : AC 230V/50Hz

Operating Mode..... : High speed + Normal wind + Swing(the worst case mode)

6.4.2 Block Diagram of Setup

The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.



6.4.3Test Results

Test Port	Test Level(kV)	Performance Criterion	Result
Line-Neutral-PE	±1.0	B	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.5 Surge

Test Requirement..... : EN 55014-2

Test Method..... : IEC 61000-4-5

Test Result..... : Pass

Test level..... : ±1kV Live to Neutral, ±2kV Live to PE and Neutral to PE,

Interval ..... : 60s between each surge

No. of surges ..... : 5 positive at 90°, 5 negative at 270°.

6.5.1E.U.T. Operation

Operating Environment:

Temperature ..... : 23.3°C

Humidity..... : 52.8%RH

Barometric Pressure..... : 101.6kPa

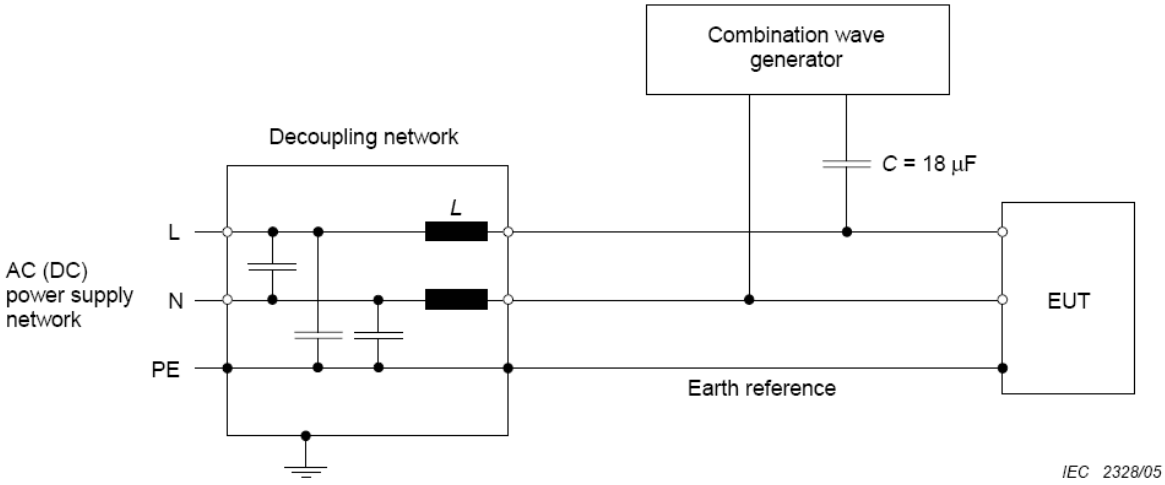
EUT Operation:

Input Voltage ..... : AC 230V/50Hz

Operating Mode..... : High speed + Normal wind + Swing(the worst case mode)

6.5.2Block Diagram of Setup

The Surge Immunity test was performed in accordance with the IEC 61000-4-5.



6.5.3Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result
Between Phase And Phase	±1	B	N/A
Between Live And Neutral	±1	B	Pass*
Between Live And Earth	±2	B	Pass*
Between Neutral And Earth	±2	B	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.6 Injected Currents Immunity, 0.15MHz to 230MHz

Test Requirement ..... : EN 55014-2

Test Method ..... : IEC 61000-4-6

Test Result ..... : Pass

Frequency Range ..... : 0.15MHz to 230MHz

Test level ..... : 3V r.m.s. (unmodulated emf into 150 Ω)

Modulation ..... : 80%, 1kHz Amplitude Modulation.

6.6.1E.U.T. Operation

Operating Environment:

Temperature ..... : 22.1°C

Humidity ..... : 52.7% RH

Barometric Pressure ..... : 101.4kPa

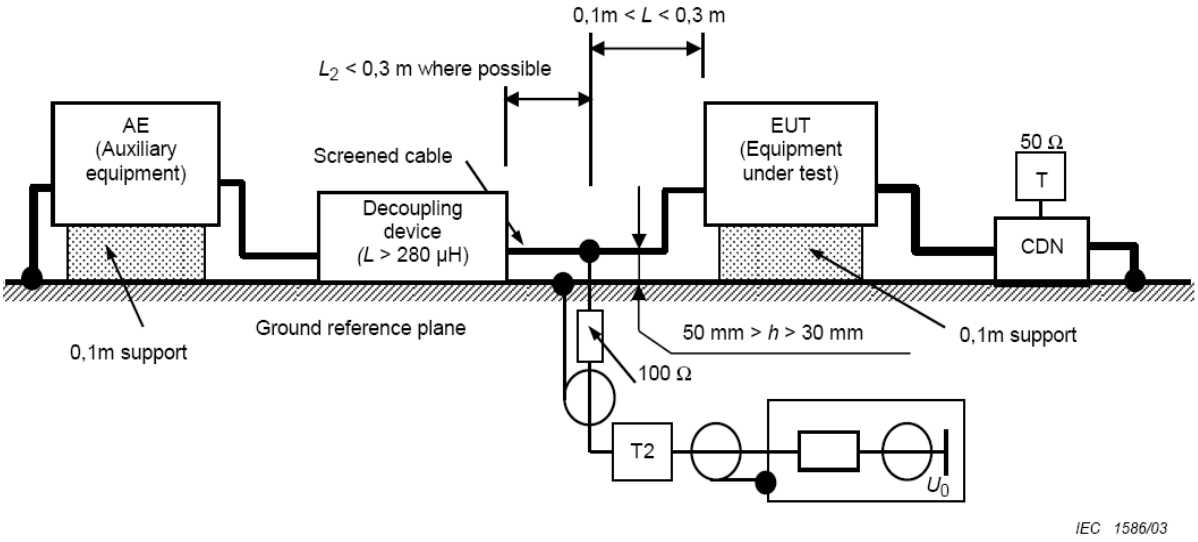
EUT Operation:

Input Voltage ..... : AC 230V/50Hz

Operating Mode ..... : High speed + Normal wind + Swing(the worst case mode)

6.6.2 Block Diagram of Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6.



6.6.3 Test Results

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result
0.15MHz to 230MHz	3 Wire AC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	Pass*

Remark:

* During the test no deviation was detected to the selected operation mode(s)

6.7 Voltage Dips and Interruptions

Test Requirement..... EN 55014-2

Test Method..... IEC 61000-4-11

Test Result..... Pass

Test Level(Voltage reduction) 0% & 40% &70 % of U_T (Supply Voltage)

No. of Dips / Interruptions..... 1 per Level at 20ms intervals

6.7.1 E.U.T. Operation

Operating Environment:

Temperature ..... 22.1°C

Humidity..... 52.7%RH

Barometric Pressure..... 101.4kPa

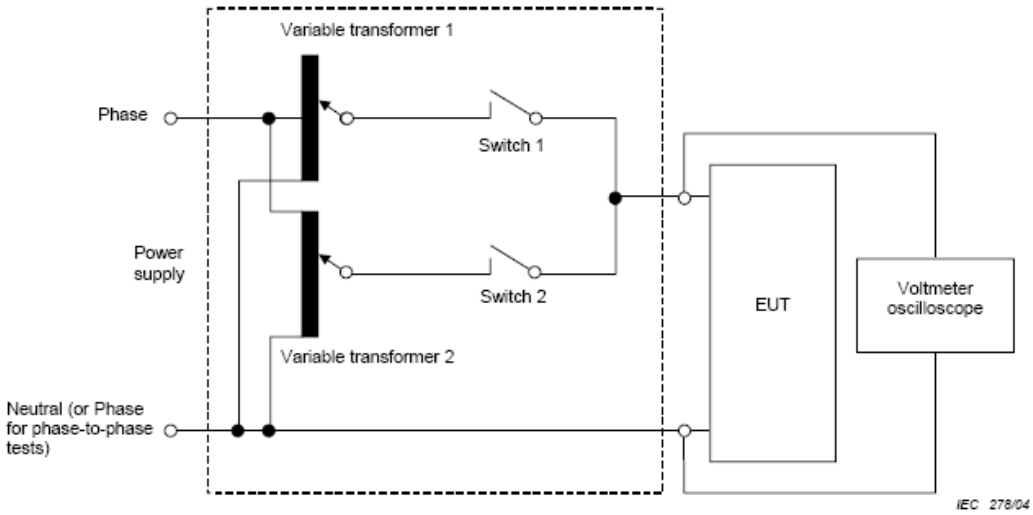
EUT Operation:

Input Voltage ..... AC 230V/50Hz

Operating Mode..... High speed + Normal wind + Swing(the worst case mode)

6.7.2 Block Diagram of Setup

The Voltage Dips and Interruptions Immunity test was performed in accordance with the IEC 61000-4-11.



6.7.3Test Results

Test Level in %U_T	Performance criterion	50Hz		60Hz	
		Duration	Result	Duration	Result
0	C	0.5	Pass*	0.5	N/A
40	C	10	Pass*	12	N/A
70	C	25	Pass*	30	N/A

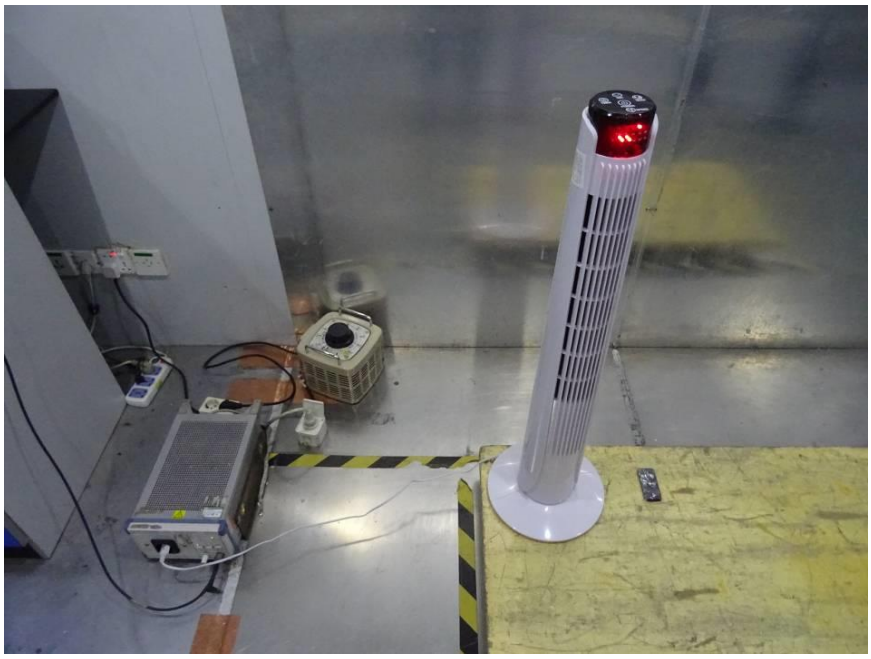
Remark:

* During the test no deviation was detected to the selected operation mode(s)

7 Photographs – Test Setup

7.1 Photograph – Mains Terminal Disturbance Voltage Test Setup

Model YF-TO3612L

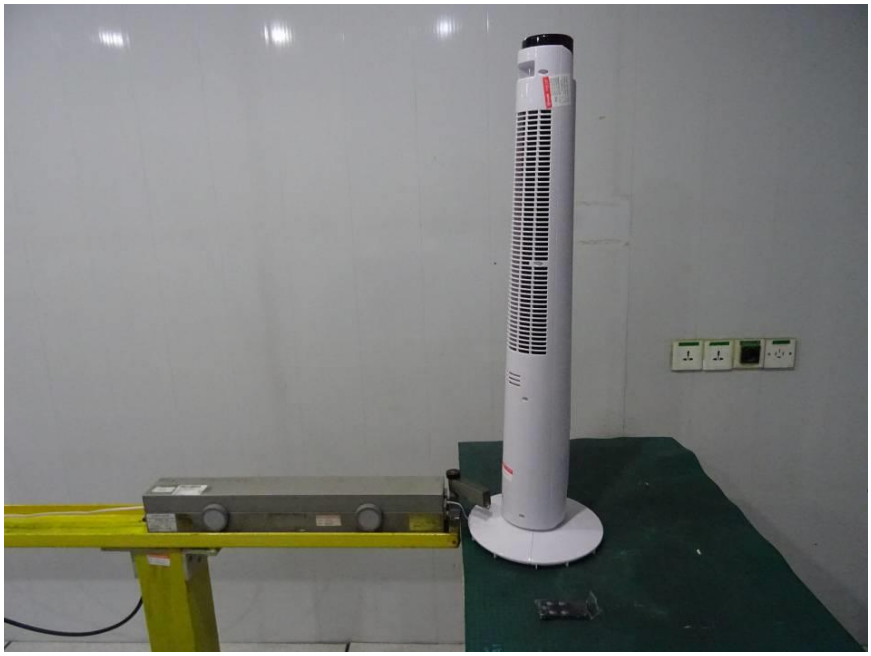


Model: YF-TO3605

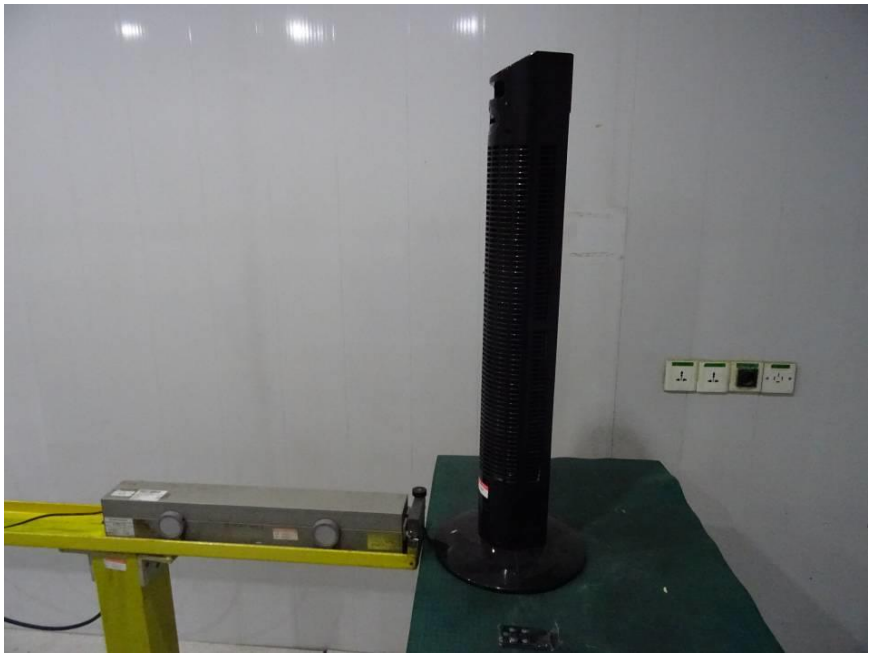
Model: YF-TO2903

7.2 Photograph – Disturbance Power Test Setup

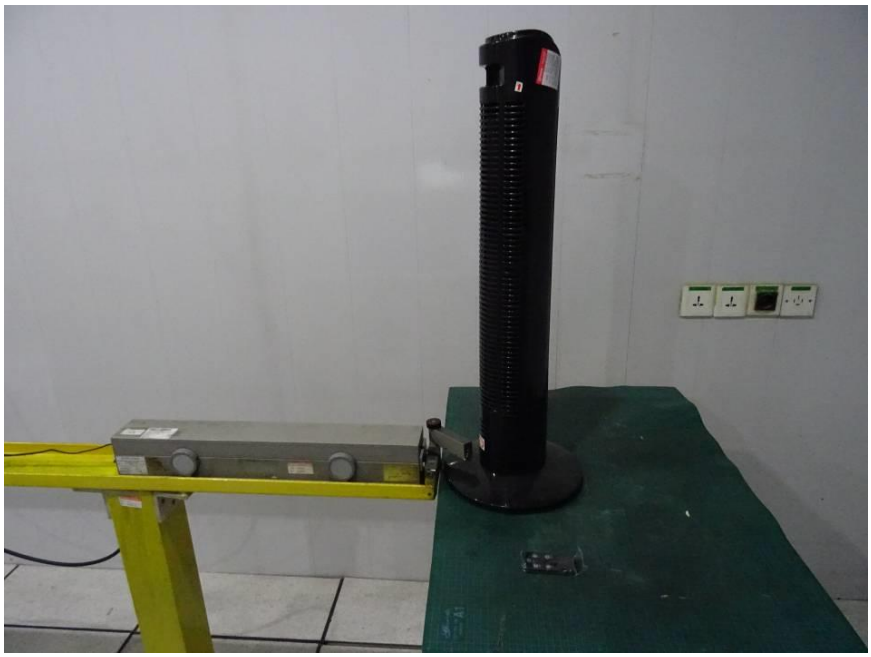
Model YF-TO3612L



Model: YF-TO3605

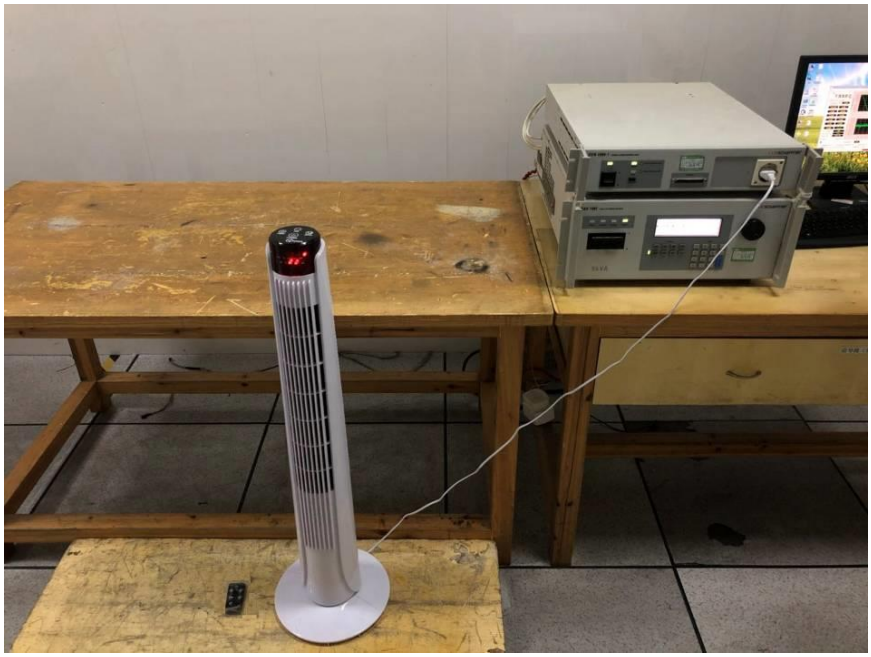


Model: YF-TO2903



7.3 Photograph – Harmonic Current and Voltage Fluctuation and Flicker Test Setup

Model YF-TO3612L

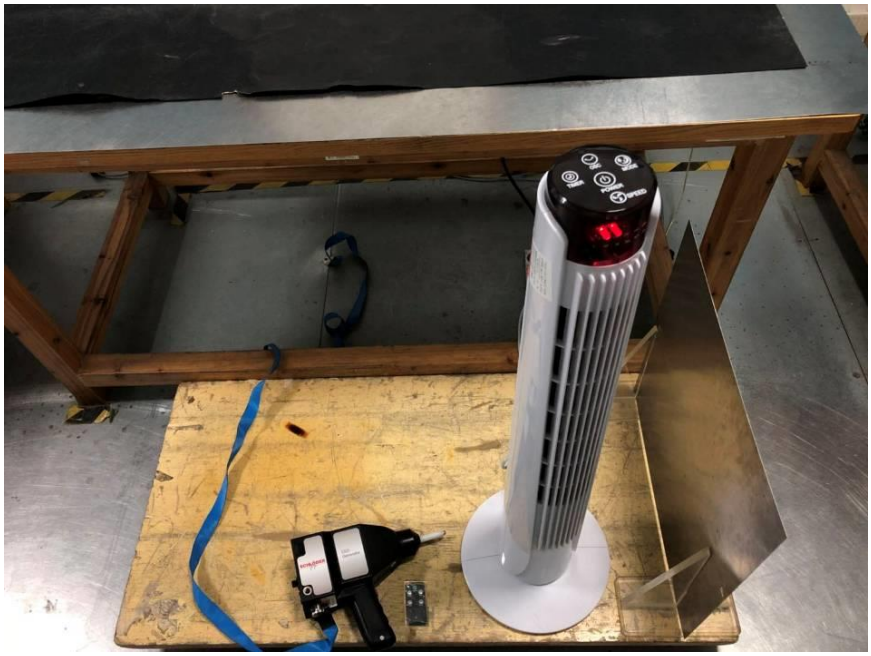


Model: YF-TO3605

Model: YF-TO2903

7.4 Photograph – ESD Immunity Test Setup

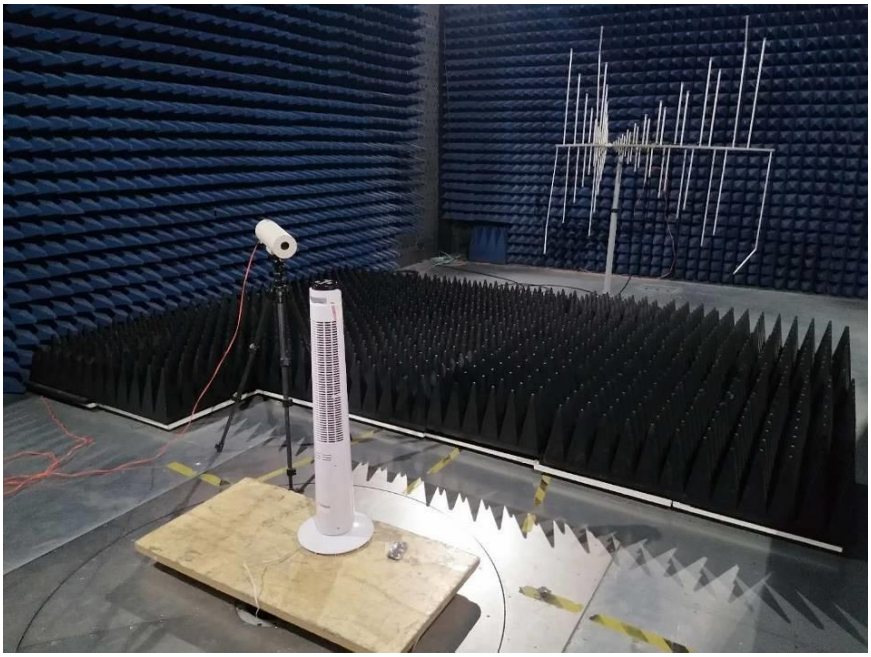
Model: YF-TO3612L



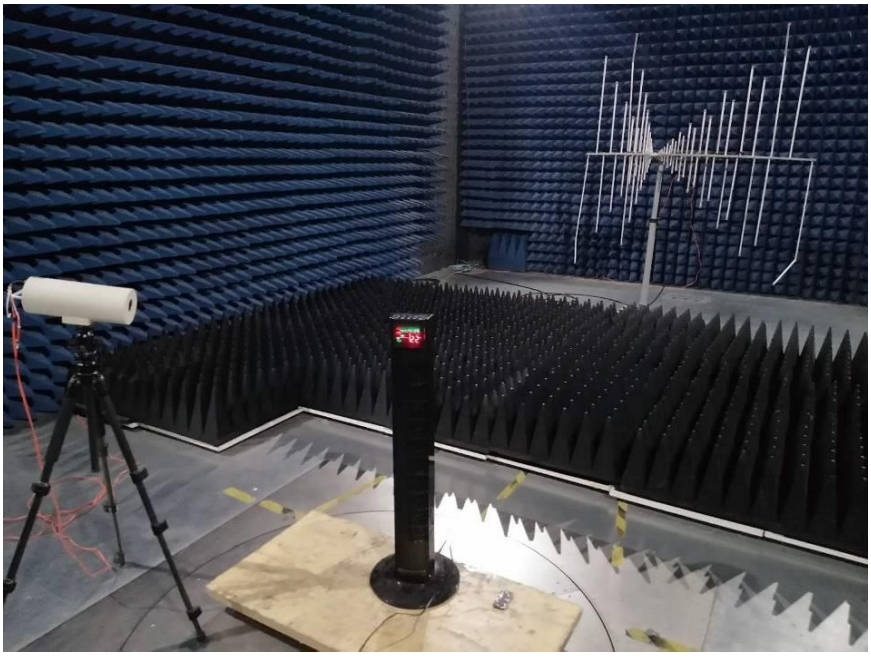
Model: YF-TO3605

7.5 Photograph – Radio-frequency electromagnetic fields Test Setup

Model: YF-TO3612L



Model: YF-TO3605



7.6 Photograph – EFT&Surge&Voltage Dips and Interruptions Immunity Test Setup

Model: YF-TO3612L

Model: YF-TO3605

7.7 Photograph – Injected Currents Immunity Test Setup

Model: YF-TO3612L

Model: YF-TO3605

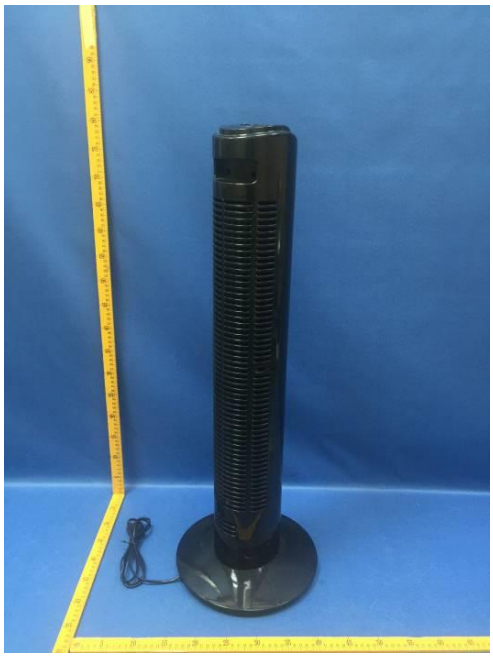
8 Photographs – Constructional Details

8.1 EUT – External View of model YF-TO3612L


0.5H 1H 2H 4H SW
L M H NL NT SL

8.2 EUT – External View of model YF-TO3605

8.3 EUT – External View of model YF-TO2903



====== End of Report ======