TEST REPORT

Reference No.	:	WTU22U05103056E
Applicant	:	Suzhou RIBAO Technology Co., ltd
Address	:	NO 299, YUANQI RD, YUANHE TECHNOLOGY PARK, XIANGCHENG 215133, SUZHOU, CHINA
Manufacturer	:	Suzhou RIBAO Technology Co., ltd
Address	:	NO 299, YUANQI RD, YUANHE TECHNOLOGY PARK, XIANGCHENG 215133, SUZHOU, CHINA
Product Name	:	Banknote Sorter
Model No	:	BCS-160, BCS-160+
Test specification	:	EN 55032:2015/A11:2020 EN 55035:2017/A11:2020 EN 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021
Date of Receipt sample	:	2019-09-27/2022-05-25
Date of Test	:	2019-09-28 to 2019-10-10/2022-05-26
Date of Issue	:	2022-06-01
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.

Prepared By:
Waltek Testing Group (Suzhou) Co., Ltd.
NO.4499,Wuzhong Avenue,Hengjing Street,Wuzhong Economic Development Zone, Suzhou,Jiang Su,China.
Tel :+86-512-66552666
Fax:+86-512-66032668
Mail:suz@waltek.com.cn

Tested by: Melody He
Melody He

Approved by: Fish Yu
Fish Yu

WALTEK TESTING GROUP CO.,LTD. WALTEK (04) TEST REPORT

1 Contents

Page

2 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTU19U09066617E	2019-09-27	2019-09-28 to 2019-10-10	2019-10-16	Update	/	/

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Banknote Sorter
Model No.	:	BCS-160, BCS-160+
Remark.....	:	This report is amendment of previous test report WTU19U09066617E due to changing of test standard and adding RS test at 1800MHz,2600MHz,3500MHz and 5000MHz.

3.2 Details of E.U.T.

Technical Data	:	Input:AC 100-240V, 50/60Hz, 100W
The Highest Operation Frequency.....	:	650MHz

3.3 Description of Support Units

The EUT has been tested as an independent unit. The tests were performed in the condition of AC 230V/50Hz input.

3.4 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 Lab: N/A

Lab address: N/A

Test items: N/A

3.5 Abnormalities from Standard Conditions

None.

4 Test Summary

EMISSION			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	EN 55032:2015/A11:2020	Table A.10	Pass
Radiated Emission, 30MHz to 1000MHz	EN 55032:2015/A11:2020	Table A.4	Pass
Radiated Emission, Above 1GHz	EN 55032:2015/A11:2020	Table A.5	Pass
Harmonic Current emission	EN 61000-3-2:2019/A1:2021	Class A	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3:2013/A2:2021	Clause 5	Pass

IMMUNITY（EN 55035:2017/A11:2020）				
Test Item	**Test Method**	**Class / Severity**	**Performance Criteria**	**Result**
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±15 kV Air	B	Pass
Radio-frequency electromagnetic fields	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 61000-4-5:2014	±1kV D.M.† ±2kV C.M.‡	B	Pass
Injected Currents, 0.15MHz to 80MHz	IEC 61000-4-6:2013	3Vr.m.s.(emf), 80%, 1kHz Amp. Mod.	A	Pass
Power-frequency magnetic Field	IEC 61000-4-8:2009	1A/m	A	Pass
Voltage Dips	IEC 61000-4-11:2004	0 % UT* for 0.5per	B	Pass
		70 % UT* for 25per	C	Pass
Voltage Interruptions	IEC 61000-4-11:2004	0 % UT* for 250per	C	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

5 Equipment Used during Test

☒Mains Terminal Disturbance Voltage (Conducted Emission)					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Test Receiver	ROHDE& SCHWARZ	ESCI	101297	2020.03.29
2.	Two-Line V-Network	ROHDE& SCHWARZ	ENV216	101538	2020.03.29
3.	Manual RF SW	ESE	RSU-A41	-	N/A
4.	3m,50 ohms Cable	HUBER SUHNER	1016873	-	N/A
☒Harmonics and Flicker Measuring System					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Digital Power Analyzer	Em Test AG	ADP500	V0745103095	2020.03.29
2.	Power Source	Em Test AG	ACS500	V0745103096	2020.03.29
☒ESD					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Electrostatic Discharge Simulator	TESEQ	NSG 438	1235	2020.03.31
☒EFT & Voltage Dips and Interruptions					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	EFT Simulator	TESEQ	NSG 3040	1982	2020.03.29
2.	Capacitive Coupling Clamp	TESEQ	CDN 3425	1690	2020.03.29
3.	Manual step transformer	TESEQ	INA6501	226	2020.03.29
☒Surge					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Surge Simulator	TESEQ	NSG3060	1516	2020.03.29
2.	Coupling Decoupling Network	TESEQ	CDN3061-S16	1434	2020.03.29
☒3m Semi-anechoic Chamber for Radiated Emission					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Test Receiver	R&S	ESCI	101296	2020.04.20
2.	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020.05.24
3.	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2020.04.28
4.	Amplifier	ANRITSU	MH648A	M43381	2020.04.19
5.	Cable	HUBER+SUHNER	CBL2	525178	2020.04.20

☒Injected Currents					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**
1.	RF generator	TESEQ	NSG4070	35088	2020.03.29
2.	Power Amplifier	TESEQ	CBA 400M-110	T44225	2020.03.29
3.	EM Clamp	TESEQ	KEMZ801A	33477	2020.03.29
4.	Coupling Decoupling Network	TESEQ	CDN M016	34615	2020.03.29
5.	Dual Directional Coupler	TESEQ	DCP 0100A	34574	2020.03.29
☒Power Frequency Magnetic Field					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**
1.	Power Frequency Magnetic Field generator	EVERFINE	EMS61000-8k	11030002	2020.03.29
☒Radio-frequency electromagnetic fields					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Due**
1.	Power Sensor	KEYSIGHT	U2004A	MY57370018 MY57370013	2023.03.27
2.	Signal generator	KEYSIGHT	N5171B	MY57280204	2023.03.27
3.	Log-Per Antenna	Schwarzbeck	STLP9128D	3020	N/A
4.	Horn Antenna	Schwarzbeck	BBHA9120D	02318	N/A
5.	Field Probe	Narda	EP 601	611WX70735	2022.11.12
6.	Power Amplifier	rflight	NTWPA-008101000E	17863188	2022.09.10
7.	Power Amplifier	rflight	NTWPA-1032200	17099088	2022.09.10
8.	Power Amplifier	rflight	NTWPA-2560200P	20063127	2022.09.10

5.1 Measurement Uncertainty

Parameter	Uncertainty (Note 1)
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions	±2.66dB
Radiated Emission(30MHz~6GHz)	±4.75dB

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

5.2 Test Mode

Test Item	Test Mode	Test Voltage
Mains Terminal Disturbance Voltage, 150kHz to 30MHz	Power on	AC 230V/50Hz
Radiated Emission, 30MHz to 1000MHz	Power on	AC 230V/50Hz
Radiated Emission, Above 1GHz	Power on	AC 230V/50Hz
Harmonic Current emission	Power on	AC 230V/50Hz
Voltage Fluctuation and Flicker	Power on	AC 230V/50Hz
Electrostatic Discharge(ESD)	Power on	AC 230V/50Hz
Radio-frequency electromagnetic fields	Power on	AC 230V/50Hz
Electrical Fast Transients (EFT)	Power on	AC 230V/50Hz
Surge	Power on	AC 230V/50Hz
Injected Currents, 0.15MHz to 80MHz	Power on	AC 230V/50Hz
Power-frequency magnetic Field	Power on	AC 230V/50Hz
Voltage Dips	Power on	AC 230V/50Hz
Voltage Interruptions	Power on	AC 230V/50Hz

6 Emission Test Results

6.1 Mains Terminals Disturbance Voltage, 150 kHz to 30MHz

Test Requirement..... : EN 55032

Test Method..... : EN 55032

Test Result..... : Pass

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

Class/Severity..... : Class B/Table A.10 of EN 55032

6.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity..... : 55%RH

Atmospheric Pressure..... : 100.3kPa

EUT Operation:

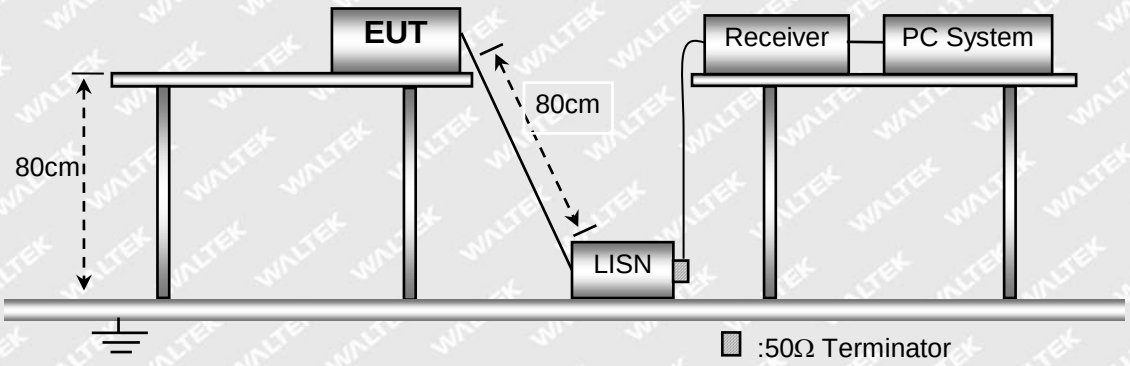
Input Voltage ..... : AC230V/50Hz

Operating Mode..... : Work mode

Classification..... : ClassB

6.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the EN 55032.

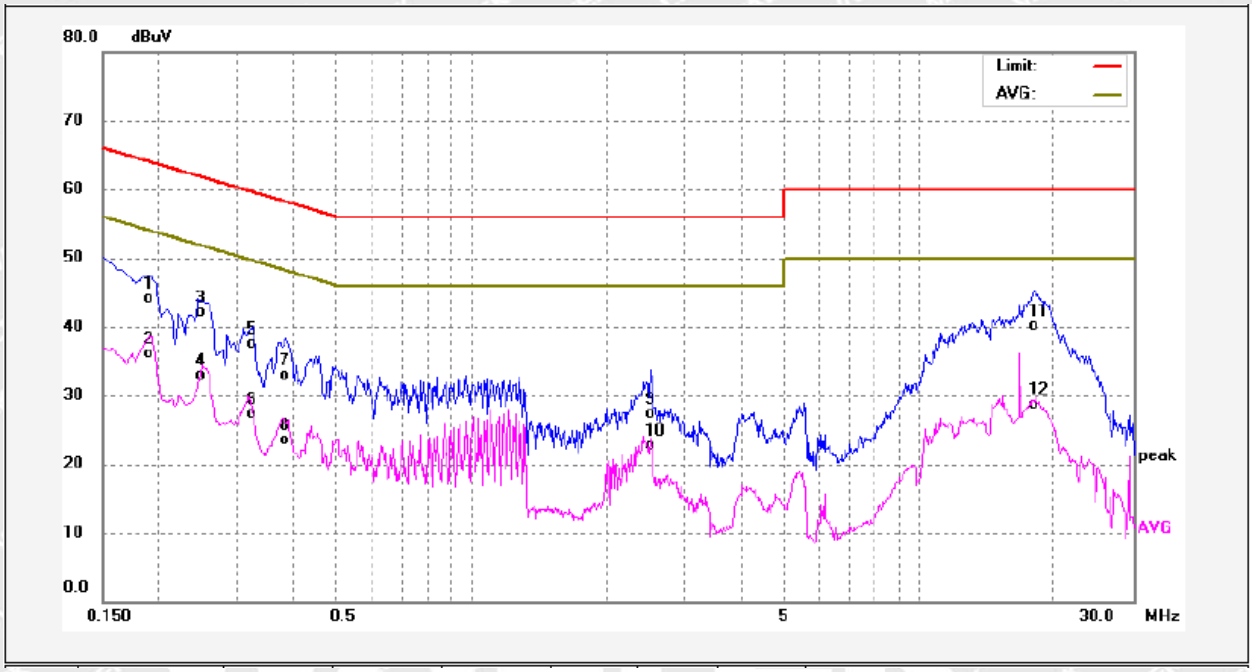


6.1.3 Measurement Data

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.

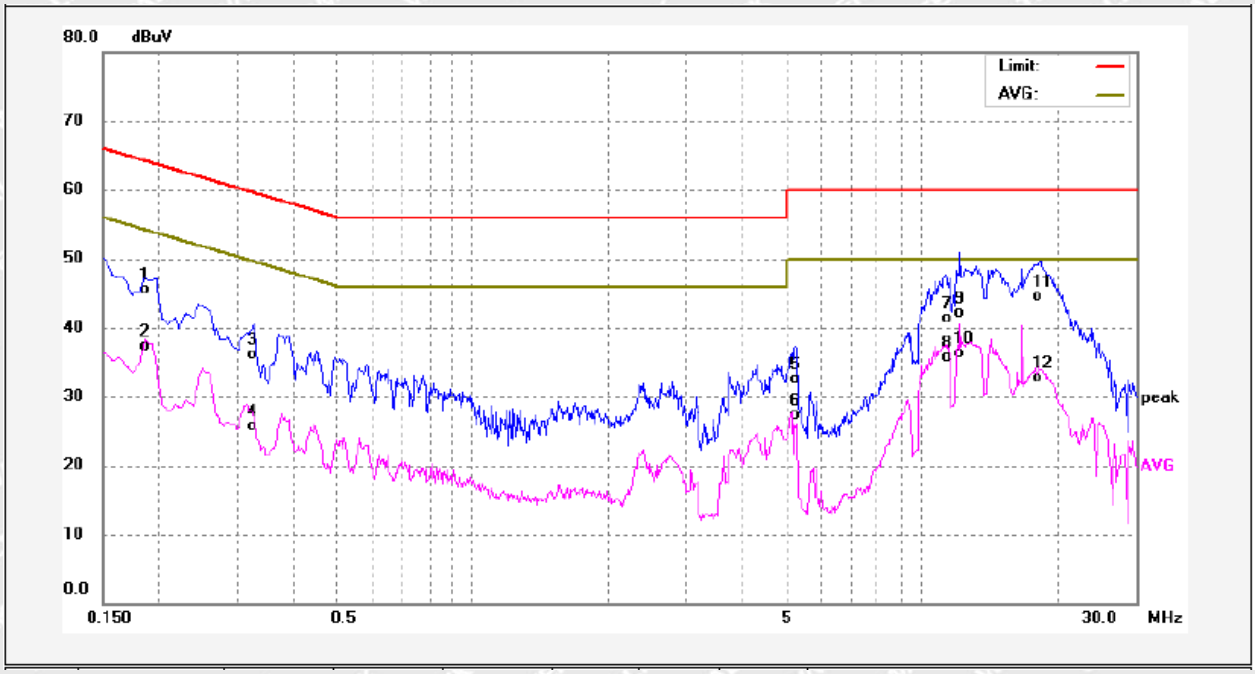
6.1.4 Mains Terminals Disturbance Voltage Test Data

Live Line :



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1900	34.47	9.66	44.13	64.03	-19.90	QP	
2	0.1900	26.50	9.66	36.16	54.03	-17.87	AVG	
3	0.2460	32.47	9.66	42.13	61.89	-19.76	QP	
4	0.2460	23.19	9.66	32.85	51.89	-19.04	AVG	
5	0.3260	27.87	9.64	37.51	59.55	-22.04	QP	
6	0.3260	17.68	9.64	27.32	49.55	-22.23	AVG	
7	0.3860	23.32	9.63	32.95	58.15	-25.20	QP	
8	0.3860	13.78	9.63	23.41	48.15	-24.74	AVG	
9	2.5100	17.62	9.68	27.30	56.00	-28.70	QP	
10	2.5100	13.12	9.68	22.80	46.00	-23.20	AVG	
11	17.9580	30.05	10.05	40.10	60.00	-19.90	QP	
12	17.9580	18.69	10.05	28.74	50.00	-21.26	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1860	35.84	9.65	45.49	64.21	-18.72	QP	
2	0.1860	27.57	9.65	37.22	54.21	-16.99	AVG	
3	0.3260	26.54	9.65	36.19	59.55	-23.36	QP	
4	0.3260	15.96	9.65	25.61	49.55	-23.94	AVG	
5	5.2420	22.85	9.73	32.58	60.00	-27.42	QP	
6	5.2420	17.49	9.73	27.22	50.00	-22.78	AVG	
7	11.2900	31.40	9.90	41.30	60.00	-18.70	QP	
8	11.2900	25.78	9.90	35.68	50.00	-14.32	AVG	
9	12.1300	32.24	9.93	42.17	60.00	-17.83	QP	
10	12.1300	26.46	9.93	36.39	50.00	-13.61	AVG	
11	18.5220	34.50	10.07	44.57	60.00	-15.43	QP	
12	18.5220	22.70	10.07	32.77	50.00	-17.23	AVG	

6.2 Radiated Emission, 30 MHz to 1GHz

Test Requirement ..... : EN 55032

Test Method ..... : EN 55032

Test Result ..... : Pass

Frequency Range ..... : 30MHz to 1GHz

Class/Severity ..... : Class B/ Table A.4 of EN 55032

6.2.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23°C

Humidity ..... : 65%RH

Atmospheric Pressure..... : 100.3kPa

EUT Operation:

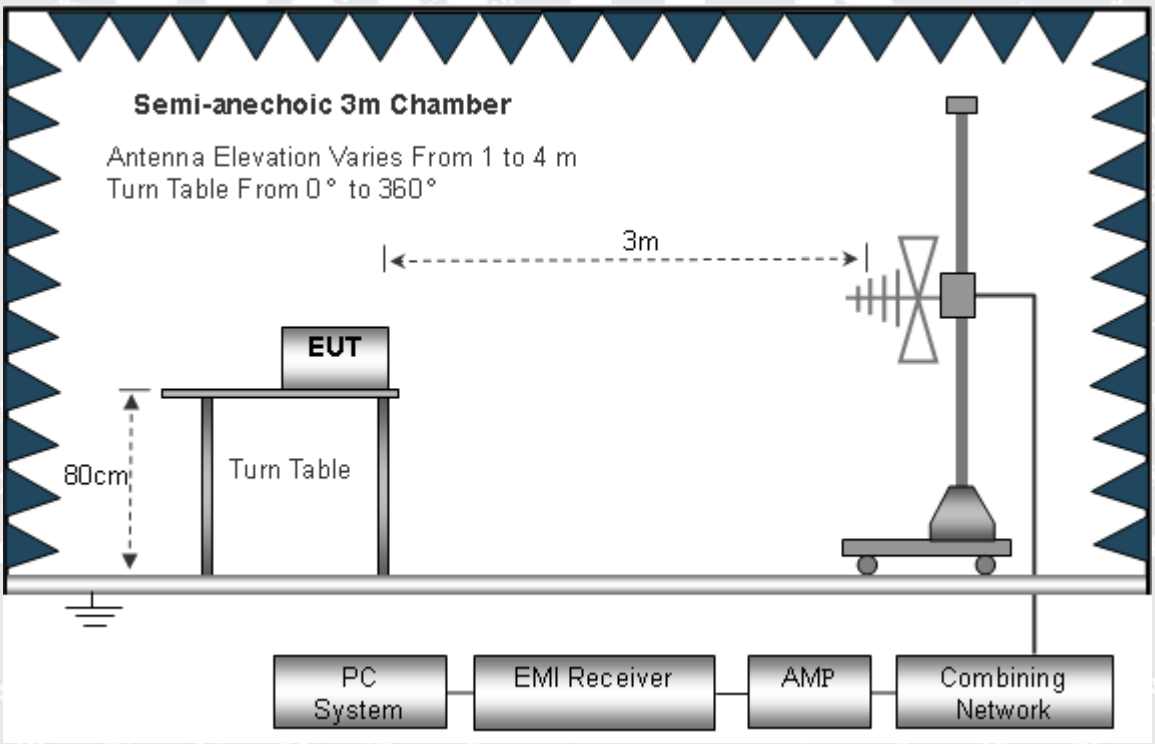
Input Voltage..... : AC230V/50Hz

Operating Mode ..... : Work mode

Classification ..... : Class B

6.2.2 Block Diagram of Test Setup

The Radiated Emission test was performed in the 3m Semi- Anechoic Chamber test site and accordance with EN 55032.

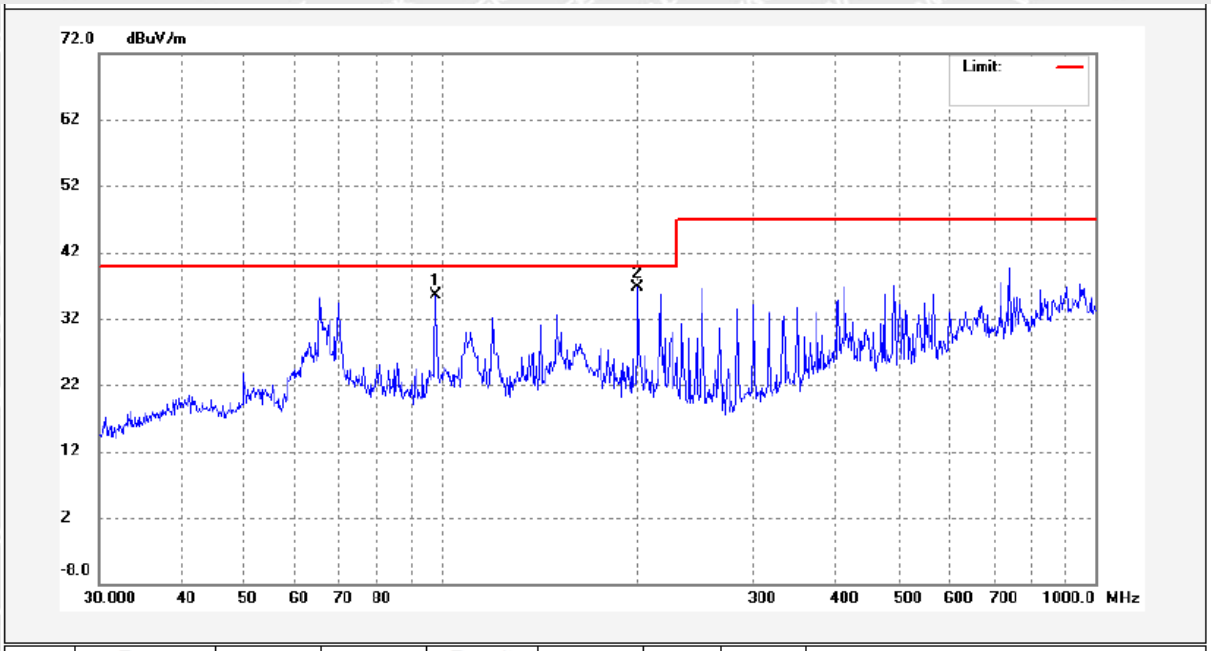


6.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.

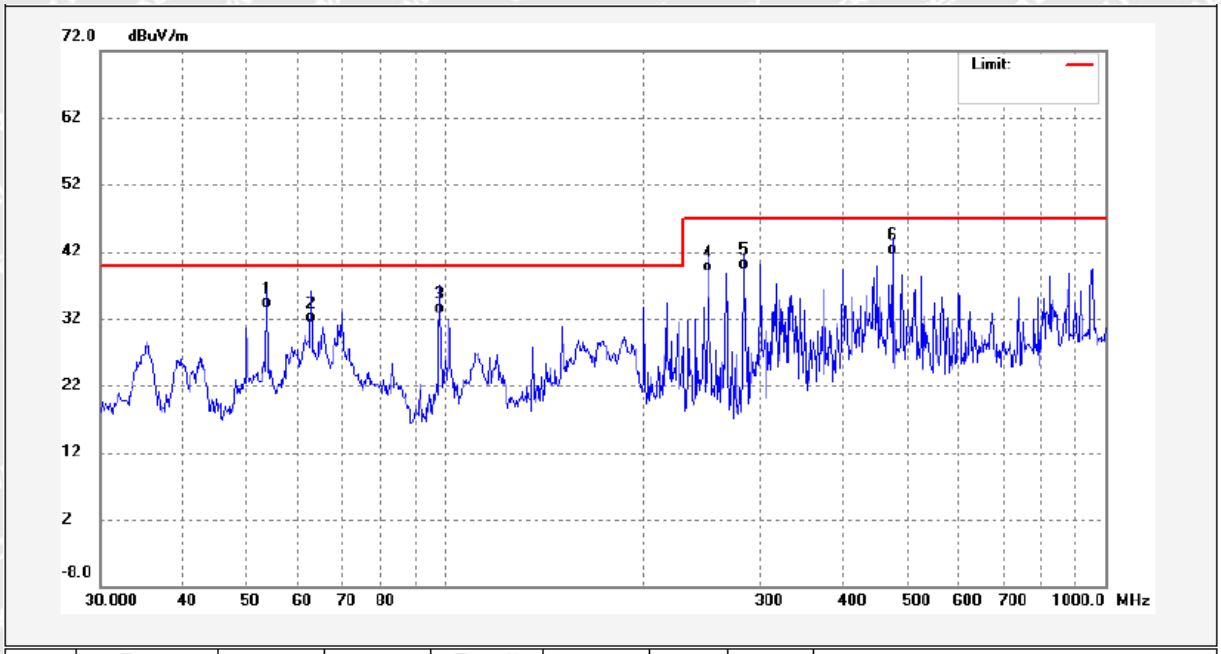
6.2.4 Radiated Emission Test Data

Horizontal Polarization:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	98.1419	21.32	14.13	35.45	40.00	-4.55	peak	
2	199.9856	23.29	13.51	36.80	40.00	-3.20	peak	

Vertical Polarization :



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	53.6932	19.52	14.74	34.26	40.00	-5.74	QP	
2	62.6507	18.45	13.72	32.17	40.00	-7.83	QP	
3	98.1419	19.43	14.13	33.56	40.00	-6.44	QP	
4	250.0012	24.80	14.84	39.64	47.00	-7.36	QP	
5	283.9791	25.48	14.65	40.13	47.00	-6.87	QP	
6	475.0052	21.70	20.51	42.21	47.00	-4.79	QP	

5.3 Radiated Emission, Above 1GHz

Test Requirement ..... : EN 55032

Test Method ..... : EN 55032

Test Result ..... : Pass

Frequency Range ..... : Above 1GHz

Class/Severity ..... : Table 5 of EN 55032

5.3.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23°C

Humidity ..... : 65%RH

Atmospheric Pressure..... : 100.3kPa

EUT Operation:

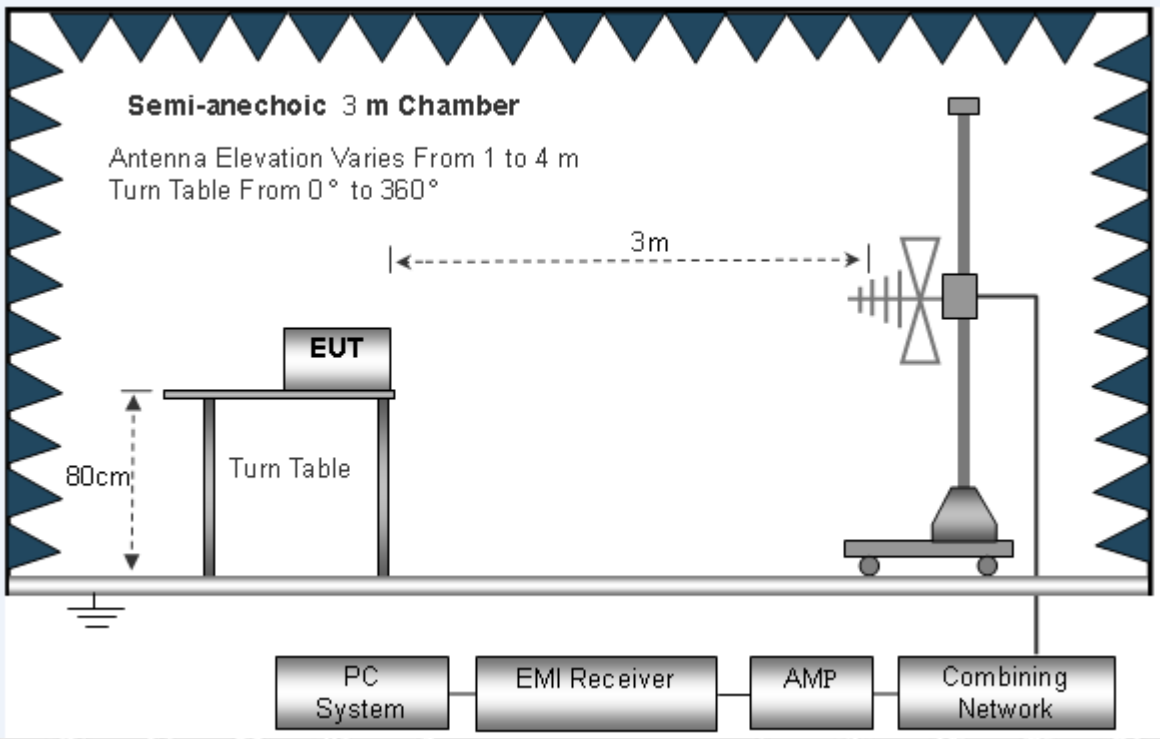
Input Voltage..... : AC 230V/50Hz

Operating Mode ..... : Work mode

Classification ..... : Class B

5.3.2 Block Diagram of Test Setup

The Radiated Emission test was performed in the 3m Semi- Anechoic Chamber test site and accordance with EN 55032.

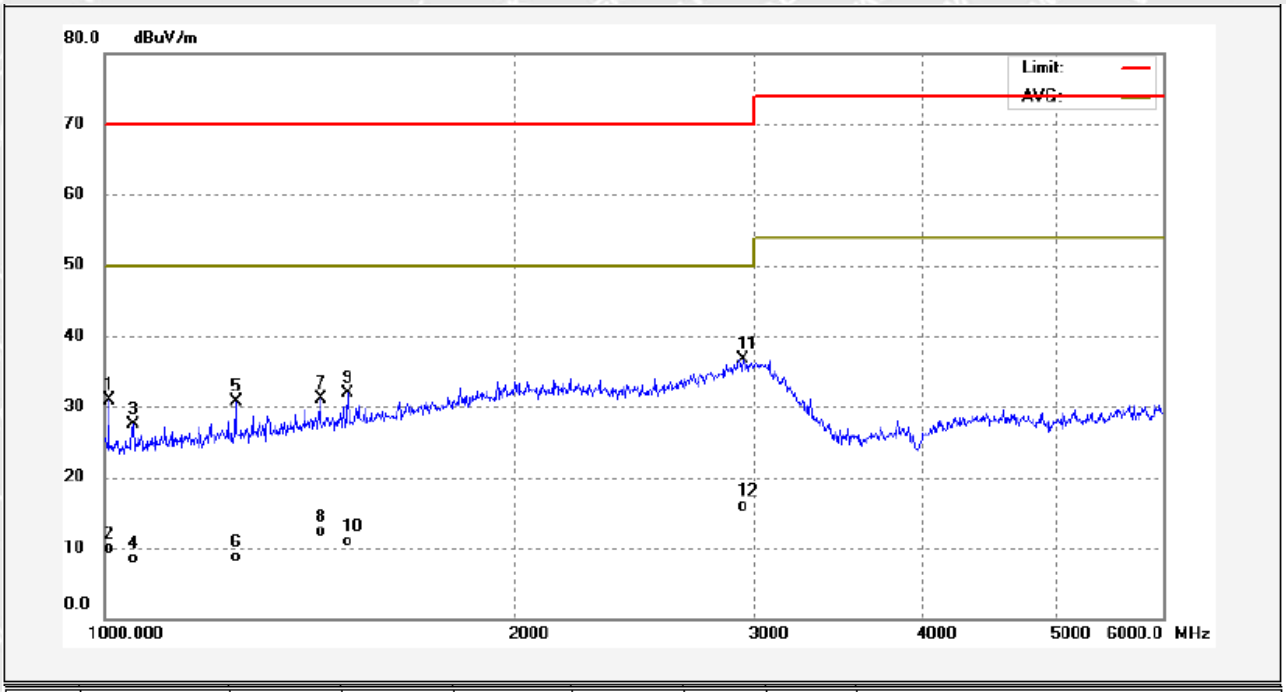


5.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.

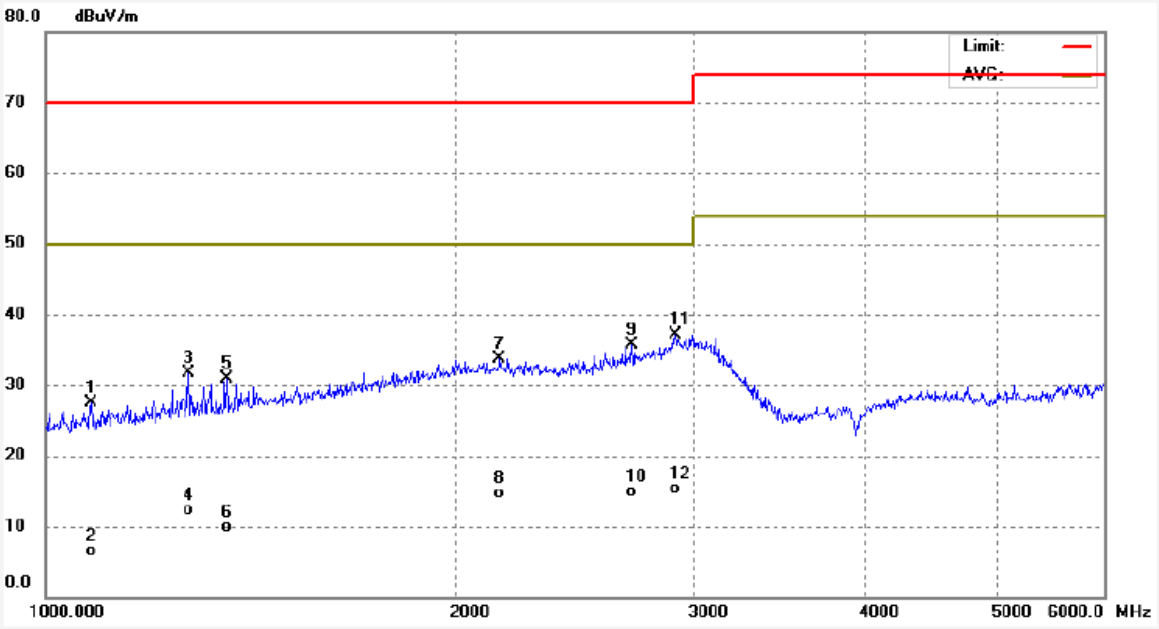
5.3.4 Radiated Emission Test Data

Horizontal Polarization:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1007.193	31.10	-0.26	30.84	70.00	-39.16	peak	
2	1007.193	10.13	-0.26	9.87	50.00	-40.13	AVG	
3	1049.567	27.37	0.09	27.46	70.00	-42.54	peak	
4	1049.567	8.44	0.09	8.53	50.00	-41.47	AVG	
5	1248.794	28.87	1.74	30.61	70.00	-39.39	peak	
6	1248.794	6.97	1.74	8.71	50.00	-41.29	AVG	
7	1441.262	27.70	3.34	31.04	70.00	-38.96	peak	
8	1441.262	8.88	3.34	12.22	50.00	-37.78	AVG	
9	1509.992	28.07	3.91	31.98	70.00	-38.02	peak	
10	1509.992	6.96	3.91	10.87	50.00	-39.13	AVG	
11	2945.949	24.64	12.13	36.77	70.00	-33.23	peak	
12	2945.949	3.71	12.13	15.84	50.00	-34.16	AVG	

Vertical Polarization :



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1080.091	27.17	0.34	27.51	70.00	-42.49	peak	
2	1080.091	6.08	0.34	6.42	50.00	-43.58	AVG	
3	1273.651	29.70	1.95	31.65	70.00	-38.35	peak	
4	1273.651	10.43	1.95	12.38	50.00	-37.62	AVG	
5	1358.513	28.31	2.65	30.96	70.00	-39.04	peak	
6	1358.513	7.23	2.65	9.88	50.00	-40.12	AVG	
7	2156.884	25.55	8.25	33.80	70.00	-36.20	peak	
8	2156.884	6.51	8.25	14.76	50.00	-35.24	AVG	
9	2698.335	25.51	10.21	35.72	70.00	-34.28	peak	
10	2698.335	4.62	10.21	14.83	50.00	-35.17	AVG	
11	2904.023	25.25	11.82	37.07	70.00	-32.93	peak	
12	2904.023	3.39	11.82	15.21	50.00	-34.79	AVG	

5.4 Harmonics Current Emission

Test Requirement..... : EN 61000-3-2

Test Method..... : EN 61000-3-2

Test Result..... : Pass

Class/Severity..... : Class A

5.4.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity..... : 55%RH

Barometric Pressure..... : 100.3kPa

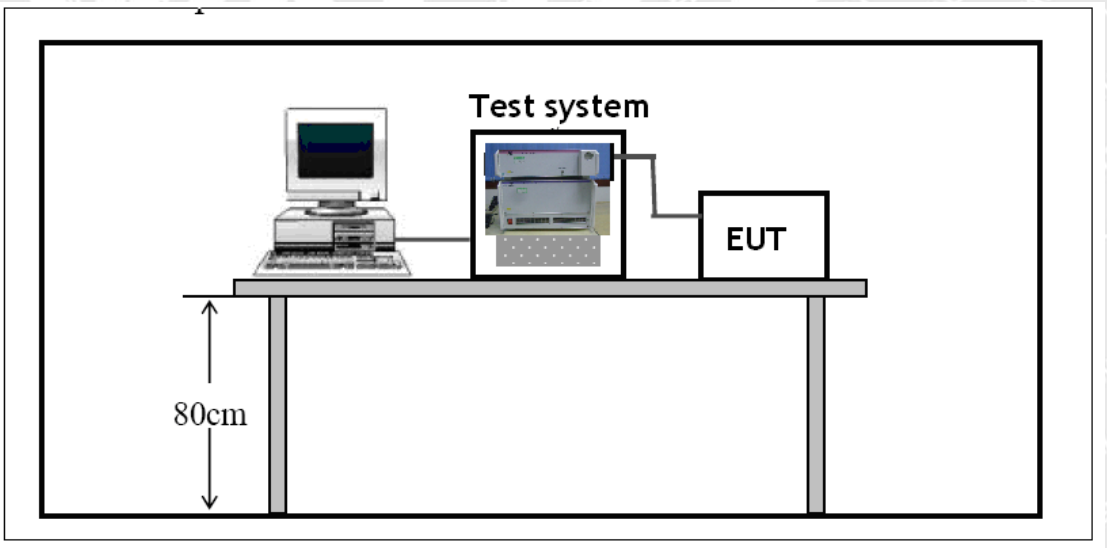
EUT Operation:

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

Operating Mode..... : Max power mode

5.4.2 Block Diagram of Setup

The Harmonics Current emission test was performed in accordance with the EN 61000-3-2.



5.4.3 Harmonic Current Emission Test Data

Report title:	WTU19U09066617E
Company Name:	WALTEK SERVICES(SUZHOU)CO.,LTD
Date of test:	20:09 8.Okt 2019
Measurement file name:	
Tester:	Iris Xie
Standard used:	EN/IEC 61000-3-2 Ed.3 Short cyclic
	Equipment class A <= 200% of the limit
Observation time:	150s
Windows width:	8 periods - (EN/IEC 61000-4-7 Edition 1991)
Customer:	
E. U. T.:	Banknote Sorter
Test Result	
E. U. T.:	PASS
Power Source:	PASS

Power and THD results - DS: 1

True power P:	13.13W	Apparent power S:	38.91VA
Reactiv power Q:	36.63var	Power factor:	0.337
THD (U):	0.001	THD (I):	1.625
Crest Factor (U):	1.413	Crest Factor (I):	2.156

Average harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	244.929E-3	100.000		
2	1.151E-3	0.470	972.00E-3	PASS
3	222.517E-3	90.849	2.07	PASS
4	1.109E-3	0.453	387.00E-3	PASS
5	207.650E-3	84.780	1.03	PASS
6	1.108E-3	0.452	270.00E-3	PASS
7	186.923E-3	76.317	693.00E-3	PASS
8	966.630E-6	0.395	207.00E-3	PASS
9	161.712E-3	66.024	360.00E-3	PASS
10	913.916E-6	0.373	165.60E-3	PASS
11	133.841E-3	54.645	297.00E-3	PASS
12	795.056E-6	0.325	138.00E-3	PASS
13	104.994E-3	42.867	189.00E-3	PASS
14	665.310E-6	0.272	118.29E-3	PASS
15	76.753E-3	31.337	135.00E-3	PASS
16	606.627E-6	0.248	103.50E-3	PASS
17	51.817E-3	21.156	119.11E-3	PASS
18	477.229E-6	0.195	92.00E-3	PASS
19	30.018E-3	12.256	106.58E-3	PASS
20	411.133E-6	0.168	82.80E-3	PASS
21	14.213E-3	5.803	96.43E-3	PASS
22	411.572E-6	0.168	75.28E-3	PASS
23	11.952E-3	4.880	88.05E-3	PASS
24	390.951E-6	0.160	68.99E-3	PASS
25	16.359E-3	6.679	81.00E-3	PASS
26	359.706E-6	0.147	63.69E-3	PASS
27	18.368E-3	7.499	75.00E-3	PASS
28	333.502E-6	0.136	59.14E-3	PASS
29	17.413E-3	7.109	69.83E-3	PASS
30	328.099E-6	0.134	55.20E-3	PASS
31	14.632E-3	5.974	65.32E-3	PASS
32	282.458E-6	0.115	51.75E-3	PASS
33	9.972E-3	4.071	61.36E-3	PASS
34	267.972E-6	0.109	48.71E-3	PASS
35	5.563E-3	2.271	57.86E-3	PASS
36	287.278E-6	0.117	46.00E-3	PASS
37	1.698E-3	0.693	54.73E-3	PASS
38	234.506E-6	0.096	43.58E-3	PASS
39	3.643E-3	1.487	51.92E-3	PASS
40	222.901E-6	0.091	41.40E-3	PASS

Maximum harmonic current results

Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	285.712E-3	100.000		
2	3.305E-3	1.157	2.16	PASS
3	264.353E-3	92.524	4.60	PASS
4	3.398E-3	1.189	860.00E-3	PASS
5	246.108E-3	86.138	2.28	PASS
6	3.374E-3	1.181	600.00E-3	PASS
7	220.974E-3	77.341	1.54	PASS
8	3.245E-3	1.136	460.00E-3	PASS
9	190.253E-3	66.589	800.00E-3	PASS
10	3.039E-3	1.064	368.00E-3	PASS
11	156.477E-3	54.767	660.00E-3	PASS
12	2.574E-3	0.901	306.66E-3	PASS
13	121.434E-3	42.502	420.00E-3	PASS
14	2.212E-3	0.774	262.86E-3	PASS
15	87.315E-3	30.561	300.00E-3	PASS
16	1.705E-3	0.597	230.00E-3	PASS
17	57.261E-3	20.041	264.70E-3	PASS
18	1.285E-3	0.450	204.44E-3	PASS
19	33.155E-3	11.604	236.84E-3	PASS
20	1.068E-3	0.374	184.00E-3	PASS
21	22.269E-3	7.794	214.28E-3	PASS
22	0.998E-3	0.349	167.28E-3	PASS
23	17.956E-3	6.285	195.66E-3	PASS
24	896.656E-6	0.314	153.32E-3	PASS
25	18.638E-3	6.523	180.00E-3	PASS
26	811.305E-6	0.284	141.54E-3	PASS
27	21.420E-3	7.497	166.66E-3	PASS
28	681.054E-6	0.238	131.42E-3	PASS
29	20.355E-3	7.124	155.18E-3	PASS
30	628.610E-6	0.220	122.66E-3	PASS
31	17.502E-3	6.126	145.16E-3	PASS
32	686.956E-6	0.240	115.00E-3	PASS
33	12.101E-3	4.235	136.36E-3	PASS
34	671.778E-6	0.235	108.24E-3	PASS
35	7.420E-3	2.597	128.58E-3	PASS
36	653.054E-6	0.229	102.22E-3	PASS
37	3.302E-3	1.156	121.62E-3	PASS
38	602.979E-6	0.211	96.84E-3	PASS
39	4.799E-3	1.680	115.38E-3	PASS
40	535.154E-6	0.187	92.00E-3	PASS

Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.89	100.386		
2	80.01E-3	0.035	0.2	PASS
3	131.97E-3	0.057	0.9	PASS
4	10.91E-3	0.005	0.2	PASS
5	43.32E-3	0.019	0.4	PASS
6	8.41E-3	0.004	0.2	PASS
7	57.07E-3	0.025	0.3	PASS
8	6.69E-3	0.003	0.2	PASS
9	108.94E-3	0.047	0.2	PASS
10	12.71E-3	0.006	0.2	PASS
11	72.51E-3	0.032	0.1	PASS
12	17.41E-3	0.008	0.1	PASS
13	63.03E-3	0.027	0.1	PASS
14	11.76E-3	0.005	0.1	PASS
15	75.42E-3	0.033	0.1	PASS
16	7.55E-3	0.003	0.1	PASS
17	80.83E-3	0.035	0.1	PASS
18	8.69E-3	0.004	0.1	PASS
19	31.24E-3	0.014	0.1	PASS
20	9.37E-3	0.004	0.1	PASS
21	62.85E-3	0.027	0.1	PASS
22	8.52E-3	0.004	0.1	PASS
23	64.57E-3	0.028	0.1	PASS
24	10.57E-3	0.005	0.1	PASS
25	36.46E-3	0.016	0.1	PASS
26	9.07E-3	0.004	0.1	PASS
27	50.02E-3	0.022	0.1	PASS
28	8.43E-3	0.004	0.1	PASS
29	53.50E-3	0.023	0.1	PASS
30	7.49E-3	0.003	0.1	PASS
31	45.99E-3	0.020	0.1	PASS
32	6.57E-3	0.003	0.1	PASS
33	32.01E-3	0.014	0.1	PASS
34	5.37E-3	0.002	0.1	PASS
35	42.31E-3	0.018	0.1	PASS
36	4.53E-3	0.002	0.1	PASS
37	37.65E-3	0.016	0.1	PASS
38	6.07E-3	0.003	0.1	PASS
39	28.58E-3	0.012	0.1	PASS
40	5.13E-3	0.002	0.1	PASS

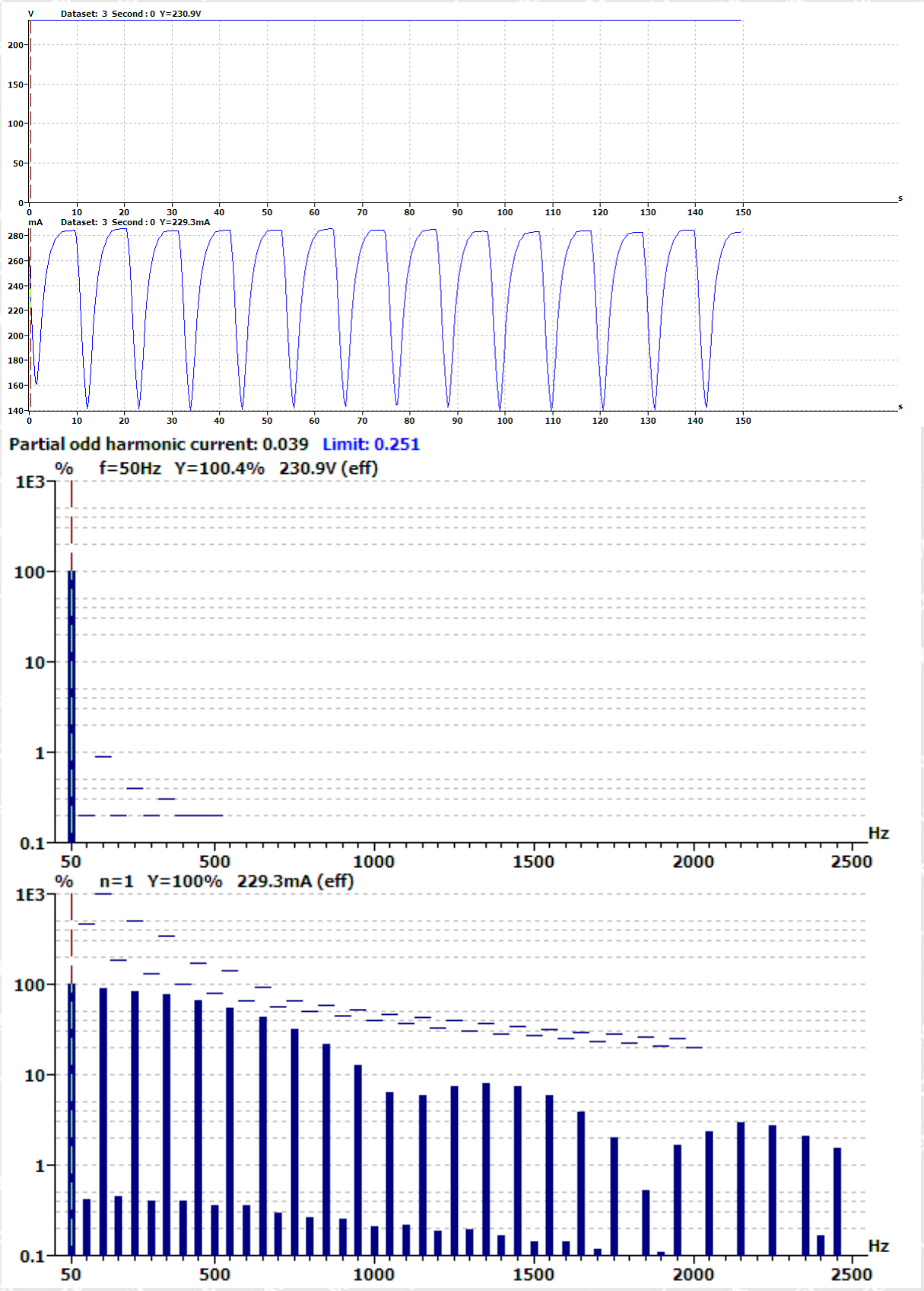
Harmonic current results - DS: 1

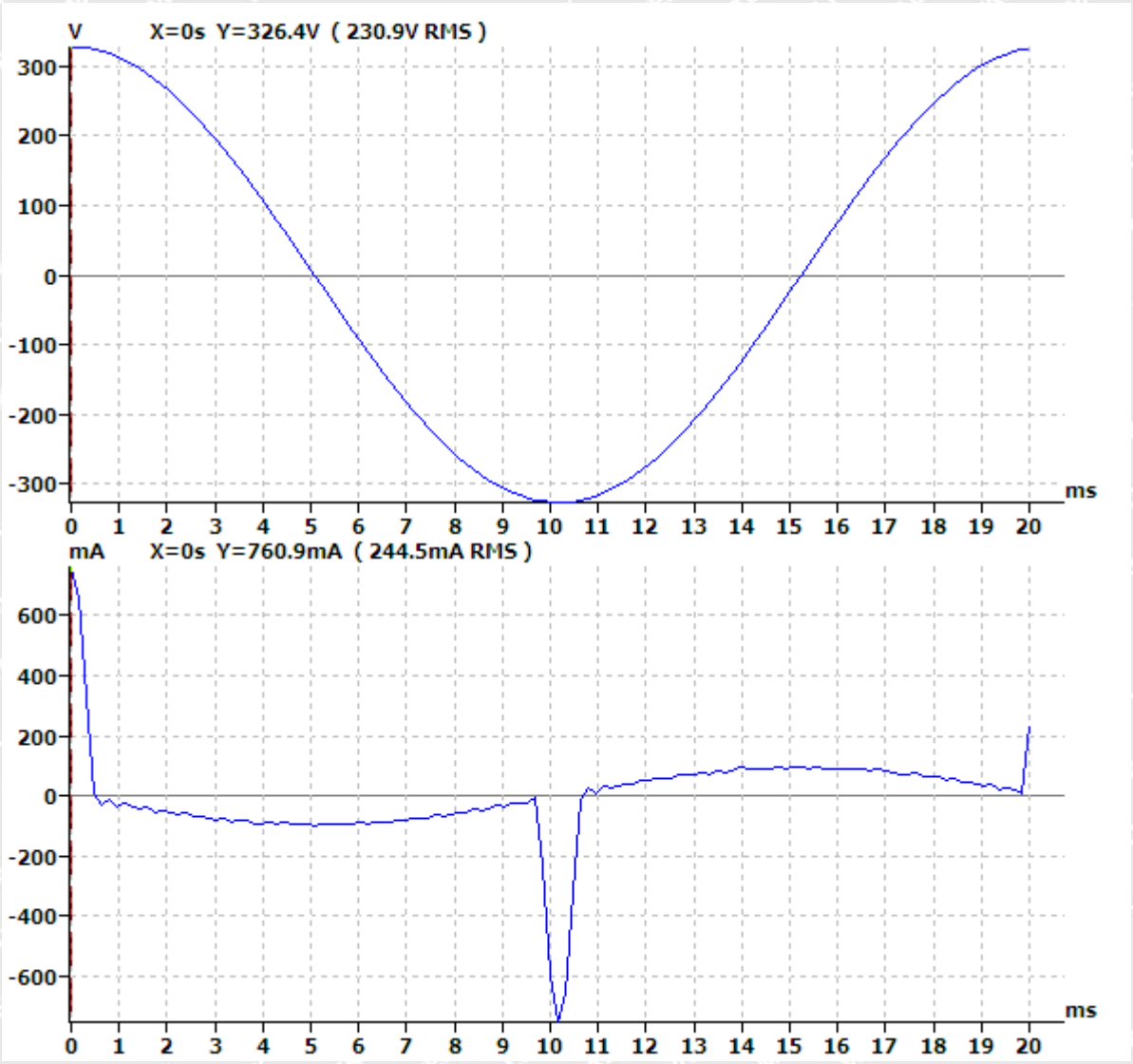
Hn	Ieff [A]	Ieff [%]	Limit [A]	Result
1	262.916E-3	100.000		
2	1.085E-3	0.413	1.08	PASS
3	242.320E-3	92.166	2.30	PASS
4	1.121E-3	0.427	430.00E-3	PASS
5	225.750E-3	85.864	1.14	PASS
6	1.027E-3	0.391	300.00E-3	PASS
7	202.569E-3	77.047	770.00E-3	PASS
8	1.031E-3	0.392	230.00E-3	PASS
9	174.448E-3	66.351	400.00E-3	PASS
10	901.800E-6	0.343	184.00E-3	PASS
11	143.366E-3	54.529	330.00E-3	PASS
12	913.145E-6	0.347	153.33E-3	PASS
13	111.377E-3	42.362	210.00E-3	PASS
14	757.696E-6	0.288	131.43E-3	PASS
15	80.076E-3	30.457	150.00E-3	PASS
16	655.612E-6	0.249	115.00E-3	PASS
17	52.502E-3	19.969	132.35E-3	PASS
18	635.304E-6	0.242	102.22E-3	PASS
19	28.766E-3	10.941	118.42E-3	PASS
20	547.910E-6	0.208	92.00E-3	PASS
21	11.914E-3	4.531	107.14E-3	PASS
22	558.243E-6	0.212	83.64E-3	PASS
23	11.277E-3	4.289	97.83E-3	PASS
24	466.141E-6	0.177	76.66E-3	PASS
25	16.805E-3	6.392	90.00E-3	PASS
26	489.626E-6	0.186	70.77E-3	PASS
27	19.208E-3	7.306	83.33E-3	PASS
28	443.806E-6	0.169	65.71E-3	PASS
29	18.287E-3	6.955	77.59E-3	PASS
30	369.574E-6	0.141	61.33E-3	PASS
31	15.387E-3	5.853	72.58E-3	PASS
32	372.747E-6	0.142	57.50E-3	PASS
33	10.215E-3	3.885	68.18E-3	PASS
34	282.375E-6	0.107	54.12E-3	PASS
35	5.385E-3	2.048	64.29E-3	PASS
36	237.267E-6	0.090	51.11E-3	PASS
37	1.155E-3	0.439	60.81E-3	PASS
38	267.889E-6	0.102	48.42E-3	PASS
39	4.107E-3	1.562	57.69E-3	PASS
40	192.343E-6	0.073	46.00E-3	PASS

Caution: Results related to the 100% limit values

Harmonic voltage results - DS: 1

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.88	100.383		
2	70.48E-3	0.031	0.2	PASS
3	88.04E-3	0.038	0.9	PASS
4	4.00E-3	0.002	0.2	PASS
5	31.65E-3	0.014	0.4	PASS
6	3.73E-3	0.002	0.2	PASS
7	9.13E-3	0.004	0.3	PASS
8	2.09E-3	0.001	0.2	PASS
9	70.90E-3	0.031	0.2	PASS
10	10.91E-3	0.005	0.2	PASS
11	40.63E-3	0.018	0.1	PASS
12	14.04E-3	0.006	0.1	PASS
13	18.54E-3	0.008	0.1	PASS
14	7.23E-3	0.003	0.1	PASS
15	69.03E-3	0.030	0.1	PASS
16	2.23E-3	0.001	0.1	PASS
17	54.99E-3	0.024	0.1	PASS
18	7.11E-3	0.003	0.1	PASS
19	26.19E-3	0.011	0.1	PASS
20	6.17E-3	0.003	0.1	PASS
21	40.01E-3	0.017	0.1	PASS
22	4.87E-3	0.002	0.1	PASS
23	61.39E-3	0.027	0.1	PASS
24	5.02E-3	0.002	0.1	PASS
25	25.38E-3	0.011	0.1	PASS
26	4.80E-3	0.002	0.1	PASS
27	22.64E-3	0.010	0.1	PASS
28	4.51E-3	0.002	0.1	PASS
29	48.97E-3	0.021	0.1	PASS
30	3.60E-3	0.002	0.1	PASS
31	31.78E-3	0.014	0.1	PASS
32	2.70E-3	0.001	0.1	PASS
33	24.45E-3	0.011	0.1	PASS
34	599.76E-6	0.000	0.1	PASS
35	37.49E-3	0.016	0.1	PASS
36	1.16E-3	0.001	0.1	PASS
37	32.84E-3	0.014	0.1	PASS
38	878.28E-6	0.000	0.1	PASS
39	21.22E-3	0.009	0.1	PASS
40	4.20E-3	0.002	0.1	PASS


V Dataset: 3 Second : 0 Y=230.9V
mA Dataset: 3 Second : 0 Y=229.3mA
Partial odd harmonic current: 0.039 Limit: 0.251
% f=50Hz Y=100.4% 230.9V (eff)
% n=1 Y=100% 229.3mA (eff)
Hz


V
X=0s Y=326.4V (230.9V RMS)
300
200
100
0
-100
-200
-300
ms
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
mA
X=0s Y=760.9mA (244.5mA RMS)
600
400
200
0
-200
-400
-600
ms
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

5.5 Voltage Fluctuation and Flicker

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

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

Test Result ..... : Pass

5.4.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity..... : 55%RH

Barometric Pressure..... : 100.3kPa

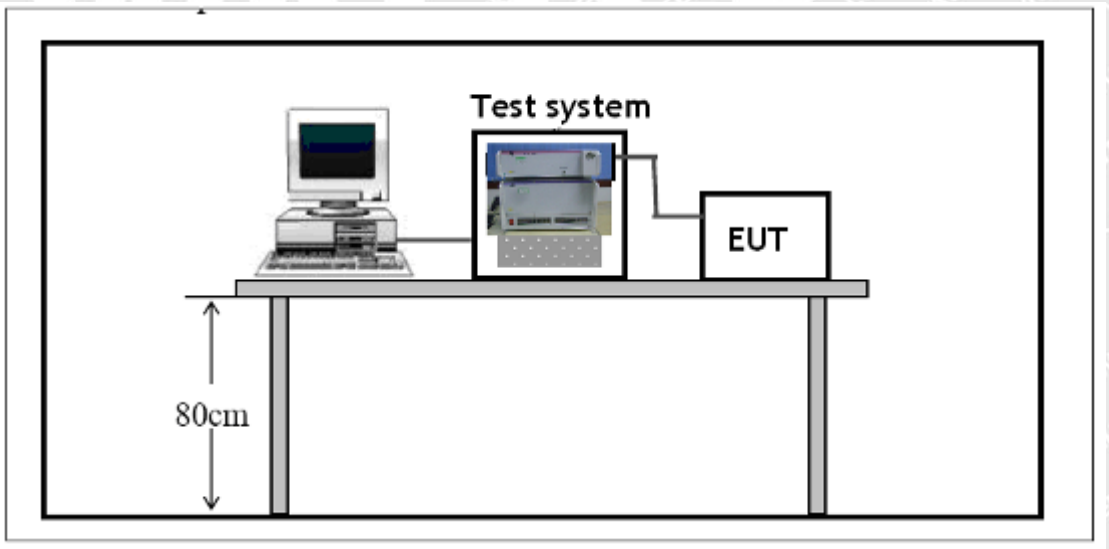
EUT Operation:

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

Operating Mode..... : Work mode

5.4.2 Block Diagram of Setup

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



5.5 Voltage Fluctuation and Flicker Test Data

Report title:	WTU19U09066616E
Company Name:	WALTEK SERVICES(SUZHOU)CO.,LTD
Date of test:	19:57 8.Okt 2019
Tester:	Iris Xie
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	230V / 50Hz
Flicker Impedance:	Zref (IEC 60725)
Customer:	
E. U. T.:	Banknote Sorter

	EUT values	Limit	Result
Pst	0.040	1.00	PASS
Plt	0.040	0.65	PASS
dc [%]	0.031	3.30	PASS
dmax [%]	0.132	4.00	PASS
dt [s]	0.000	0.50	PASS

7 Immunity Test Results

7.1 Performance Criteria

Performance criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

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 manufacturer, when the equipment is used as intended. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test

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

7.2 Electrostatic Discharge (ESD)

Test Requirement.....	:	EN 55035
Test Method.....	:	IEC 61000-4-2
Test Result.....	:	Pass
Discharge Impedance.....	:	330Ω / 150pF
Discharge Voltage.....	:	Air Discharge: ±15kV 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

7.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity ..... : 48%RH

Barometric Pressure ..... : 100.3kPa

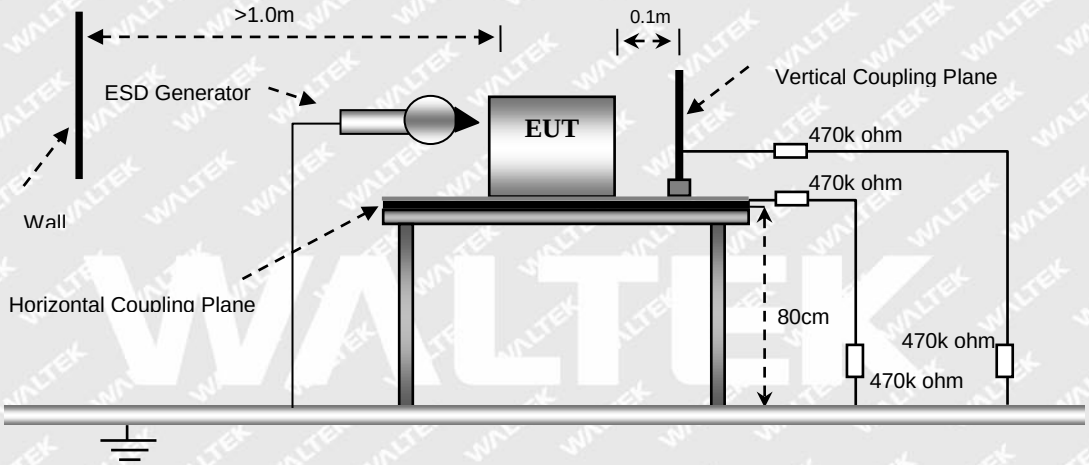
EUT Operation:

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

Operating Mode..... : Work mode

7.2.2 Block Diagram of Setup

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



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

7.2.3 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
±15	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)

7.2.4 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)

7.3 Electrical Fast Transients (EFT)

Test Requirement..... : EN 55035

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

7.3.1E.U.T. Operation

Operating Environment:

Temperature..... : 23°C

Humidity ..... : 55%RH

Barometric Pressure ..... : 100.3kPa

EUT Operation:

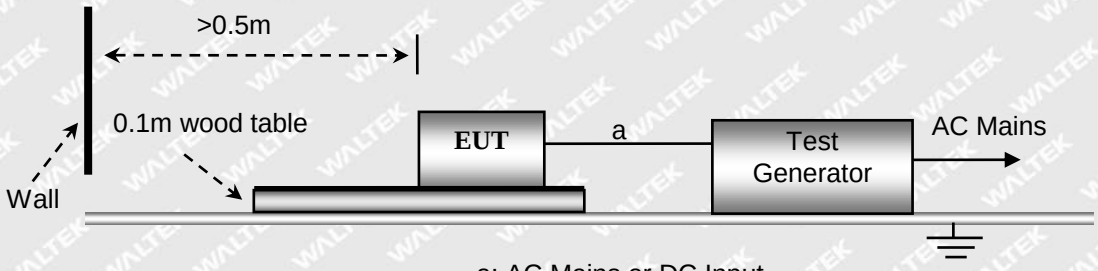
Input Voltage..... : AC 230V/50Hz

Operating Mode ..... : Work mode

7.3.2 Block Diagram of Setup

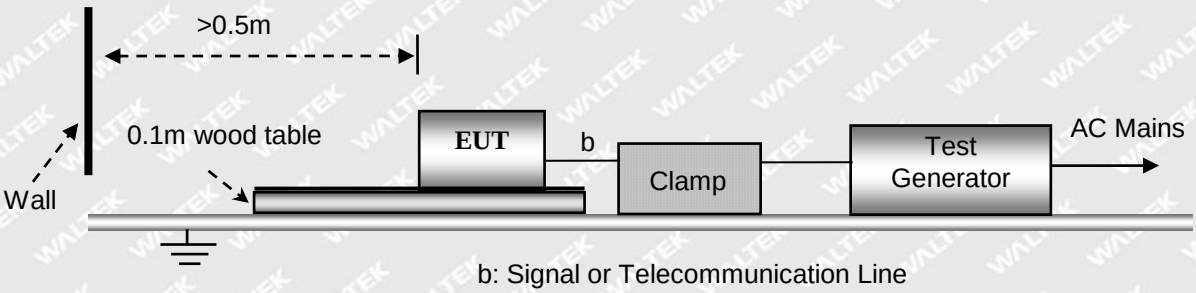
The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.

For AC Mains or DC Input:



a: AC Mains or DC Input

For Signal or Telecommunication Port:



b: Signal or Telecommunication Line

7.3.3Test Results

Path under Test	Test Level(kV)	Coupling Direct/Clamp	Performance Criterion	Result
Line-Neutral-PE	±1.0	Direct	B	Pass*

Remark:

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

7.4 Surge

Test Requirement..... : EN 55035

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 ..... : five positive and five negative pulses each at 0º, 90º, 180º and at 270º

7.4.1E.U.T. Operation

Operating Environment:

Temperature ..... : 23°C

Humidity..... : 65%RH

Barometric Pressure..... : 100.3kPa

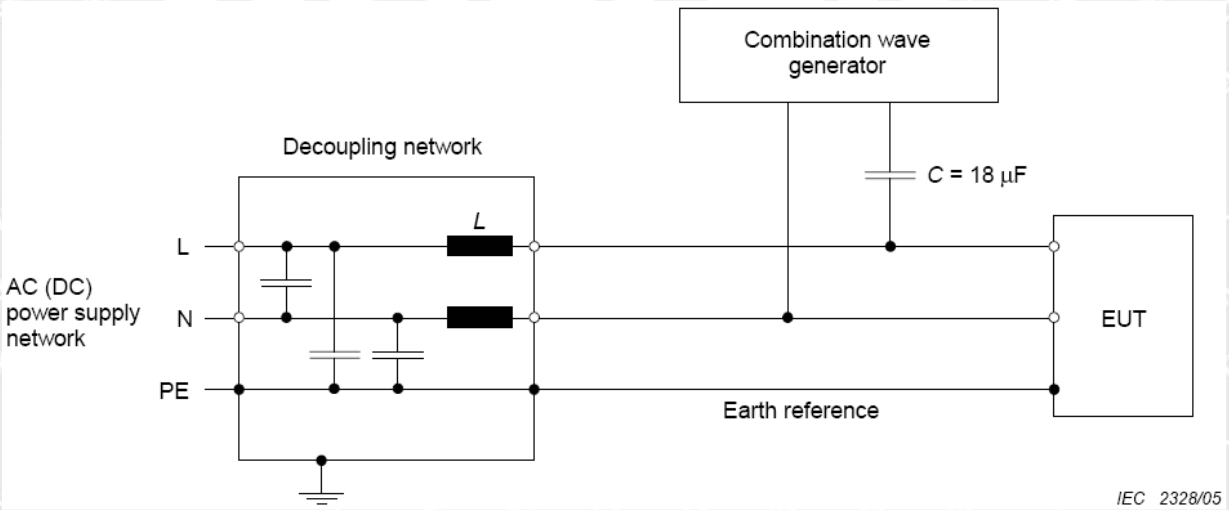
EUT Operation:

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

Operating Mode..... : Work mode

7.4.2Block Diagram of Setup

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



7.4.3Test Result

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)

7.5 Radio-frequency electromagnetic fields

Test Requirement ..... : EN 55035

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

Test Result ..... : Pass

Frequency Range ..... : 80MHz to 1GHz,above 1G

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

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

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

Antenna polarisation .. : Horizontal& Vertical

7.5.1E.U.T. Operation

Operating Environment:

Temperature..... : 23°C

Humidity ..... : 55%RH

Barometric Pressure ..... : 100.3kPa

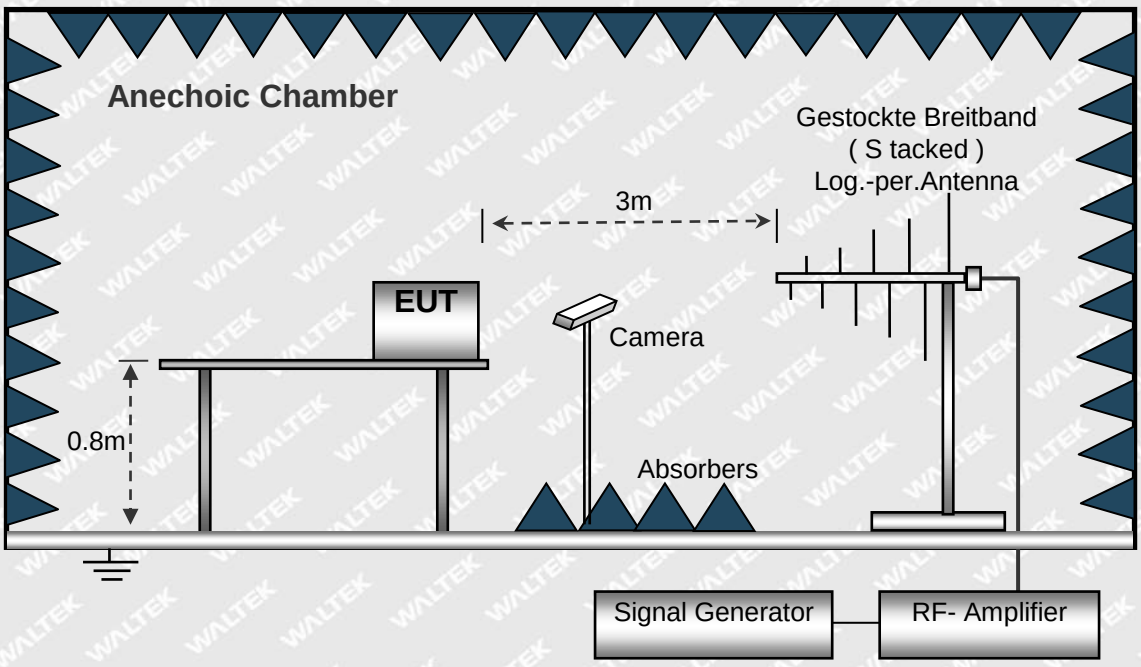
EUT Operation:

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

Operating Mode ..... : Work mode

7.5.2 Block Diagram of Setup

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



7.5.3 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*
1800MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
1800MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
5000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
5000MHz	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)

7.6 Injected Currents Immunity, 0.15MHz to 80MHz

Test Requirement ..... : EN 55035

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

Test Result ..... : Pass

Frequency Range ..... : 0.15MHz to 80MHz

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

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

7.6.1E.U.T. Operation

Operating Environment:

Temperature ..... : 23.0°C

Humidity..... : 54.3% RH

Barometric Pressure..... : 101.5kPa

EUT Operation:

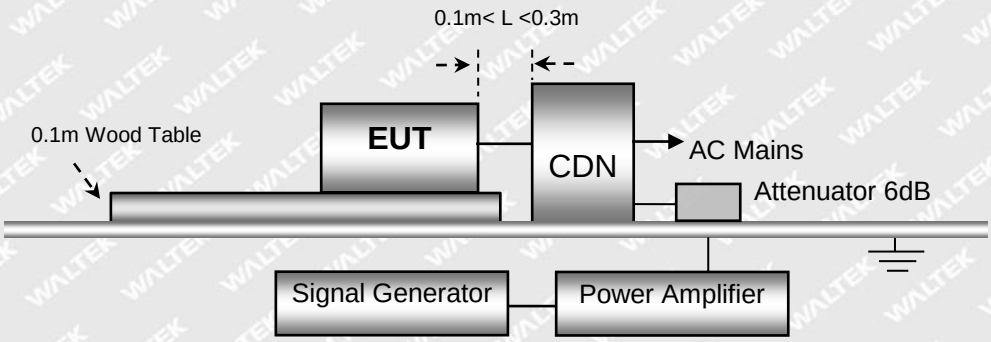
Input Voltage ..... : AC 230V/50Hz

Operating Mode..... : Work mode

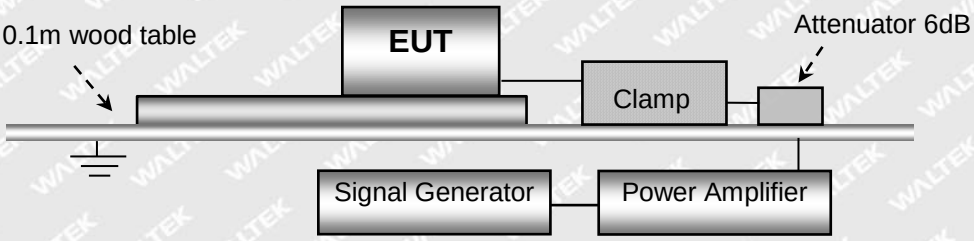
7.6.2 Block Diagram of Setup

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

For AC Mains or DC Input:



For Signal or Telecommunication Port:



7.6.3Test Results

Frequency	Injected Position	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result
0.15MHz to 80MHz	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)

7.7 Power Frequency Magnetic Field Immunity

Test Requirement ..... : EN 55035

Test Method ..... : IEC 61000-4-8

Test Result ..... : Pass

Test level ..... : 1A/m

Test Duration ..... : 60 s each Axis

Axis ..... : X-axis, Y-axis and Z-axis

7.7.1E.U.T. Operation

Operating Environment:

Temperature..... : 23°C

Humidity ..... : 65%RH

Barometric Pressure ..... : 100.3kPa

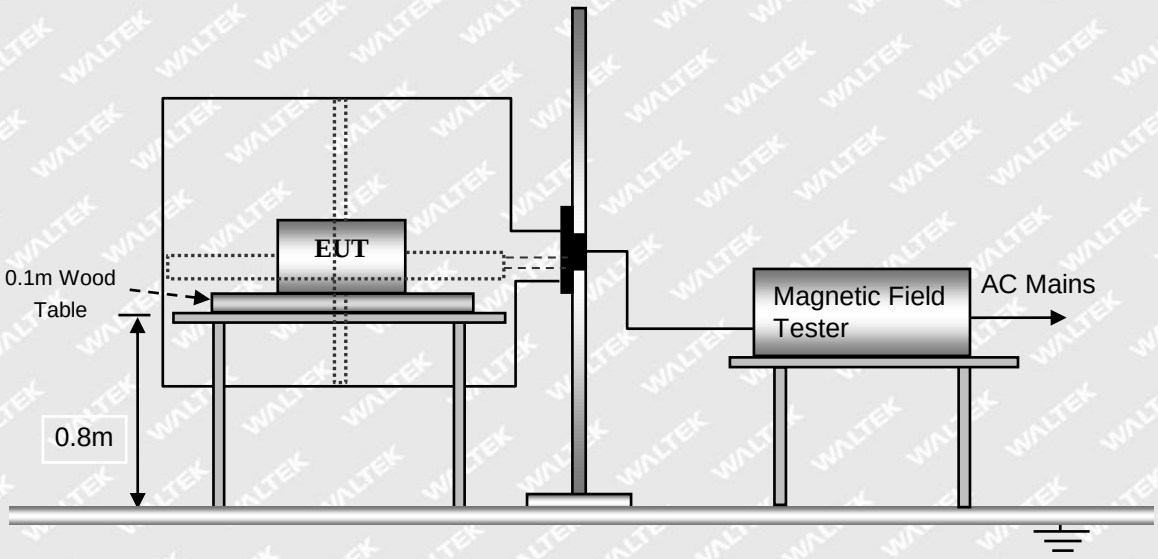
EUT Operation:

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

Operating Mode ..... : Work mode

7.7.2 Block Diagram of Setup

The Power Frequency Magnetic Field Immunity test was performed in accordance with the IEC 61000-4-8.



7.7.3 Test Result

Frequency	Axis	Test Level	Performance Criterion	Result
50Hz	X Y Z	1A/m	A	Pass*

Remark:

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

7.8 Voltage Dips and Interruptions

Test Requirement..... EN 55035

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

Test Result..... Pass

Test Level(Voltage reduction) >90% &30 % of Induction

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

7.8.1E.U.T. Operation

Operating Environment:

Temperature..... 23°C

Humidity..... 55%RH

Barometric Pressure..... 100.3kPa

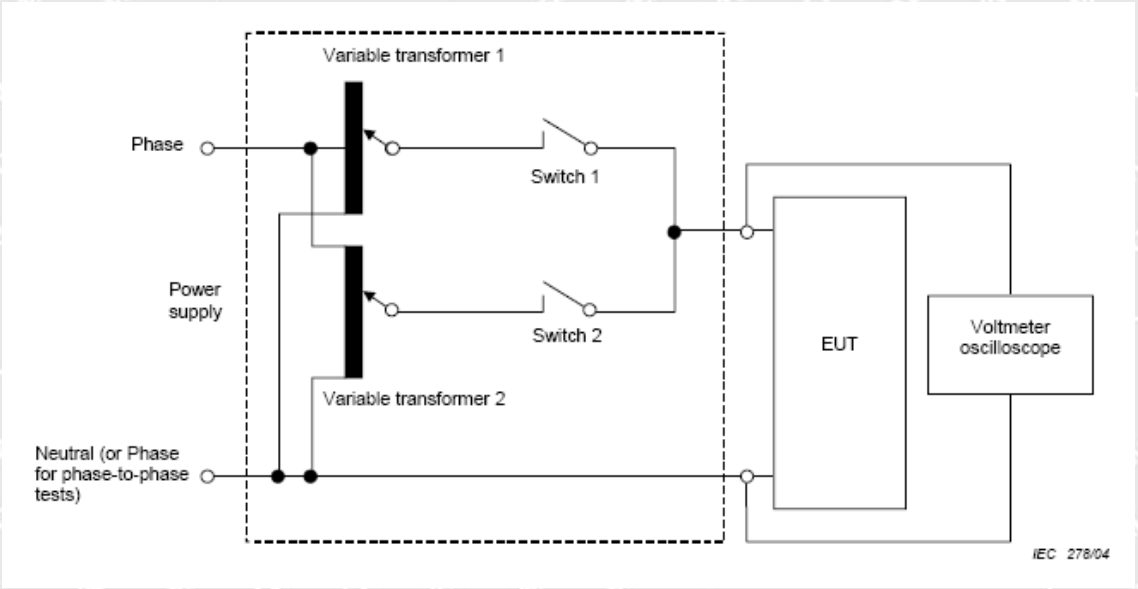
EUT Operation:

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

Operating Mode..... Work mode

7.8.2 Block Diagram of Setup

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



7.8.3Test Results

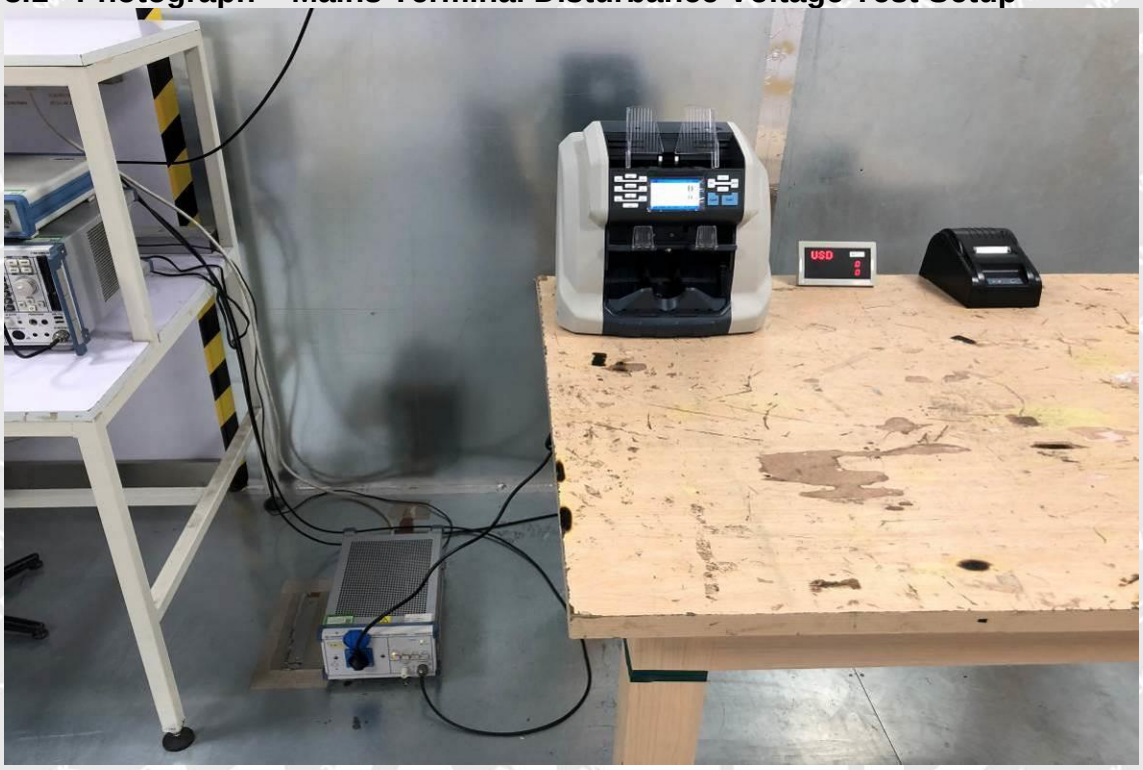
Test Item	Test Level in %U_T	Performance criterion	50Hz		60Hz	
			Duration	Result	Duration	Result
Voltage Dips	0	B	0.5	Pass*	0.5	N/A
	70	C	25	Pass*	30	N/A
Voltage Interruptions	0	C	250	Pass**	300	N/A

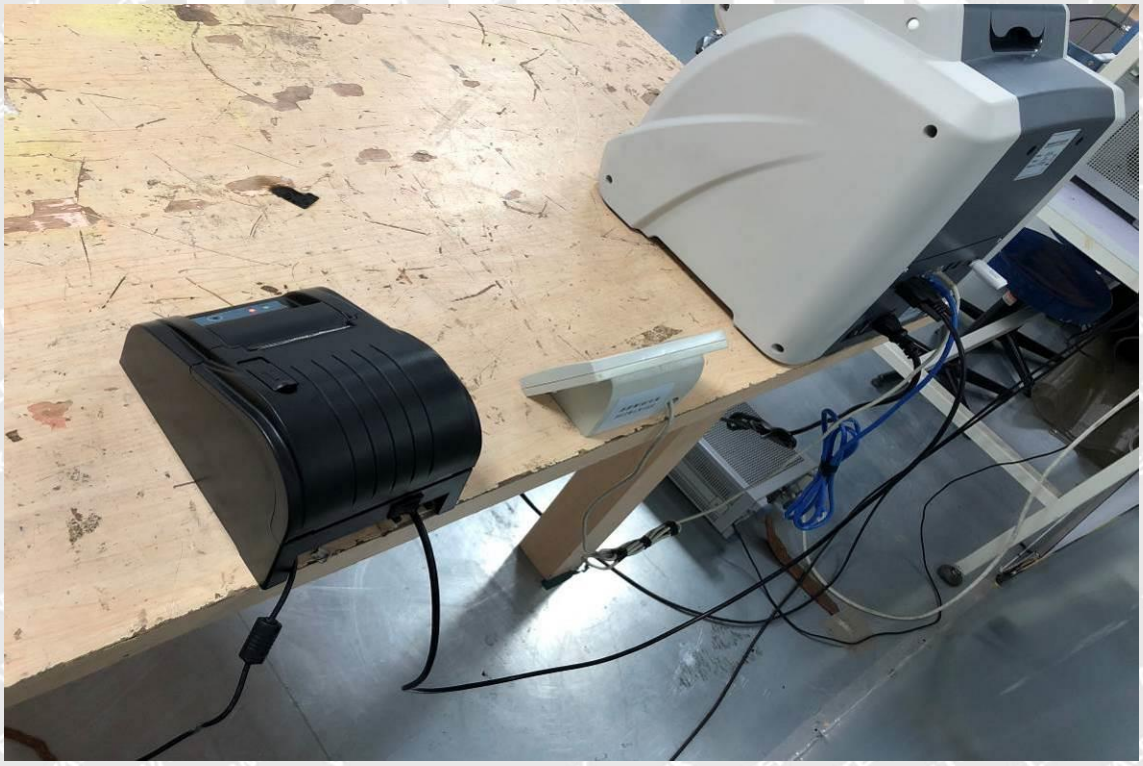
Remark:

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

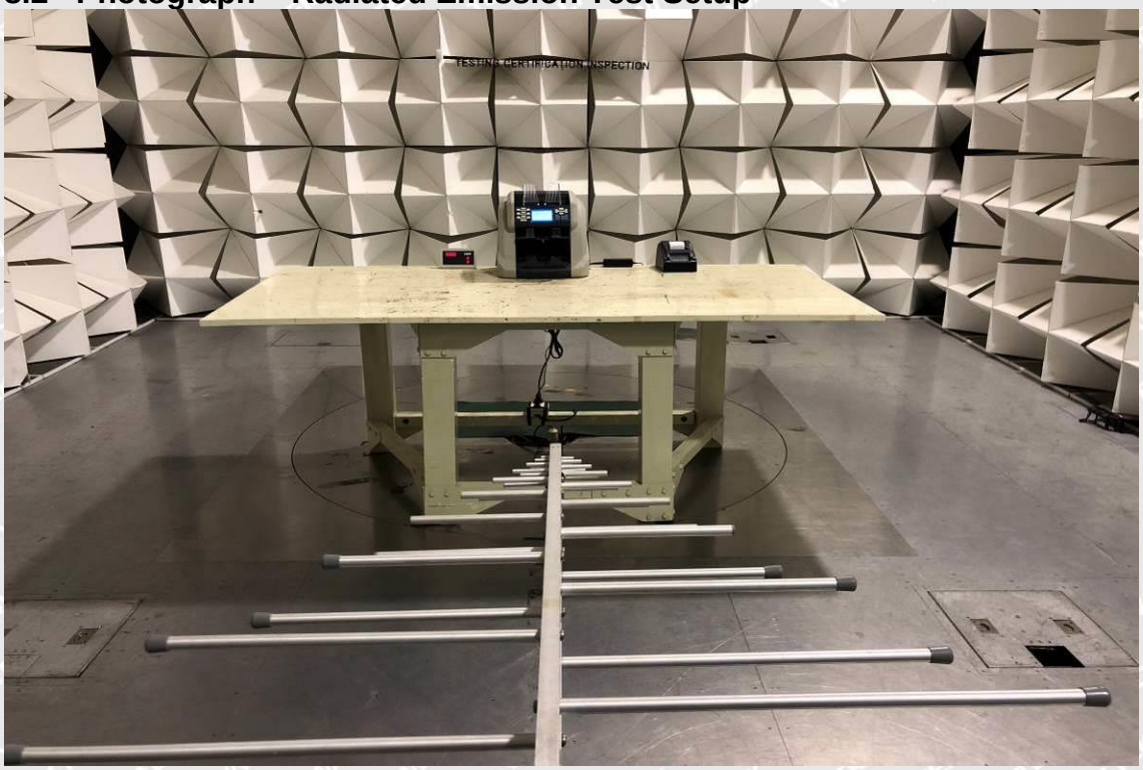
8 Photographs – Test Setup

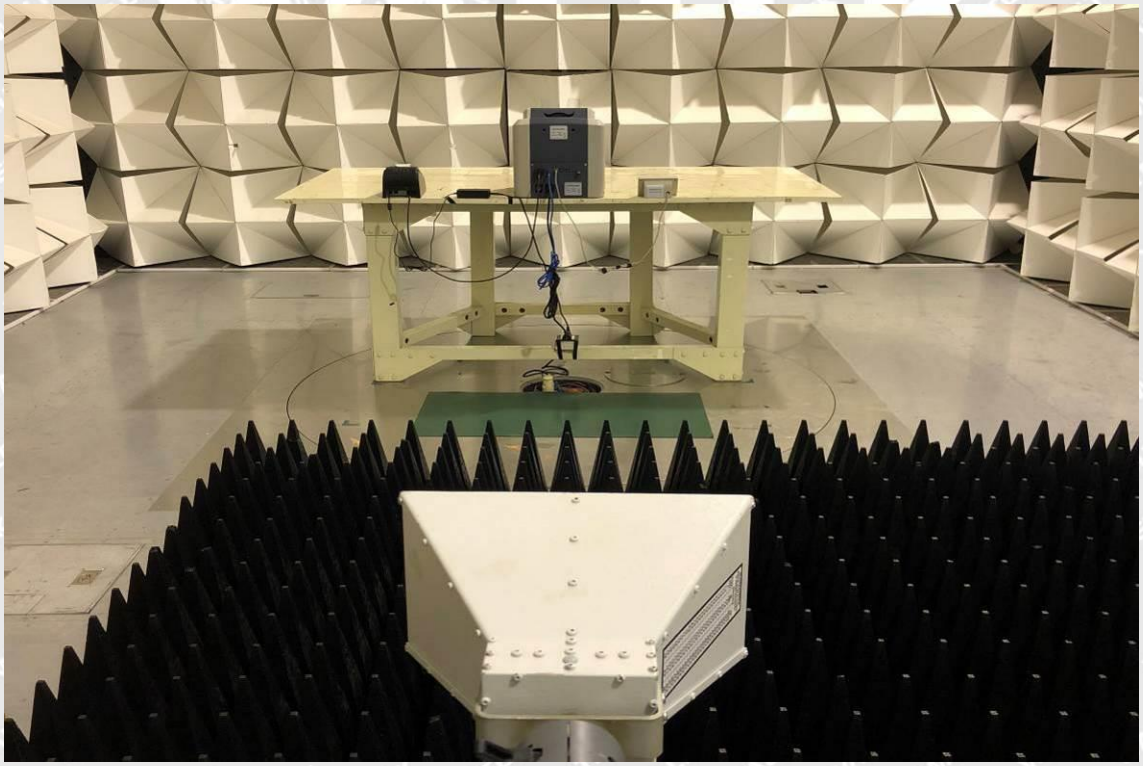
8.1 Photograph – Mains Terminal Disturbance Voltage Test Setup





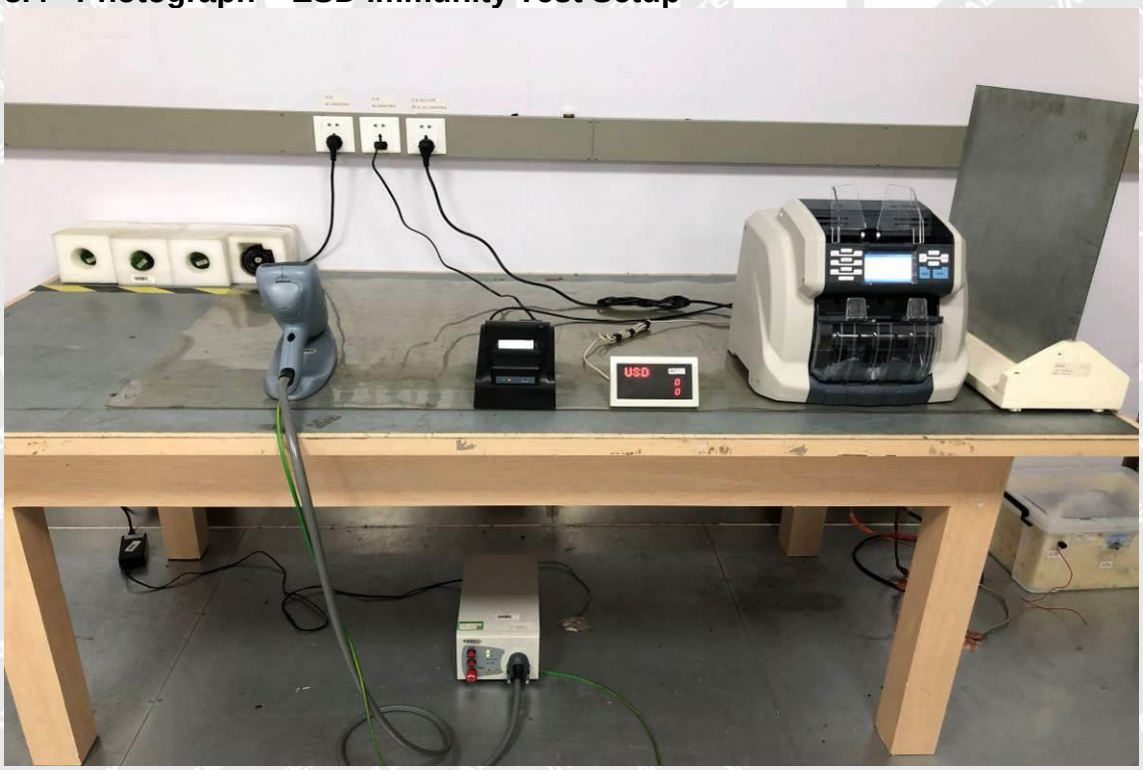
8.2 Photograph – Radiated Emission Test Setup





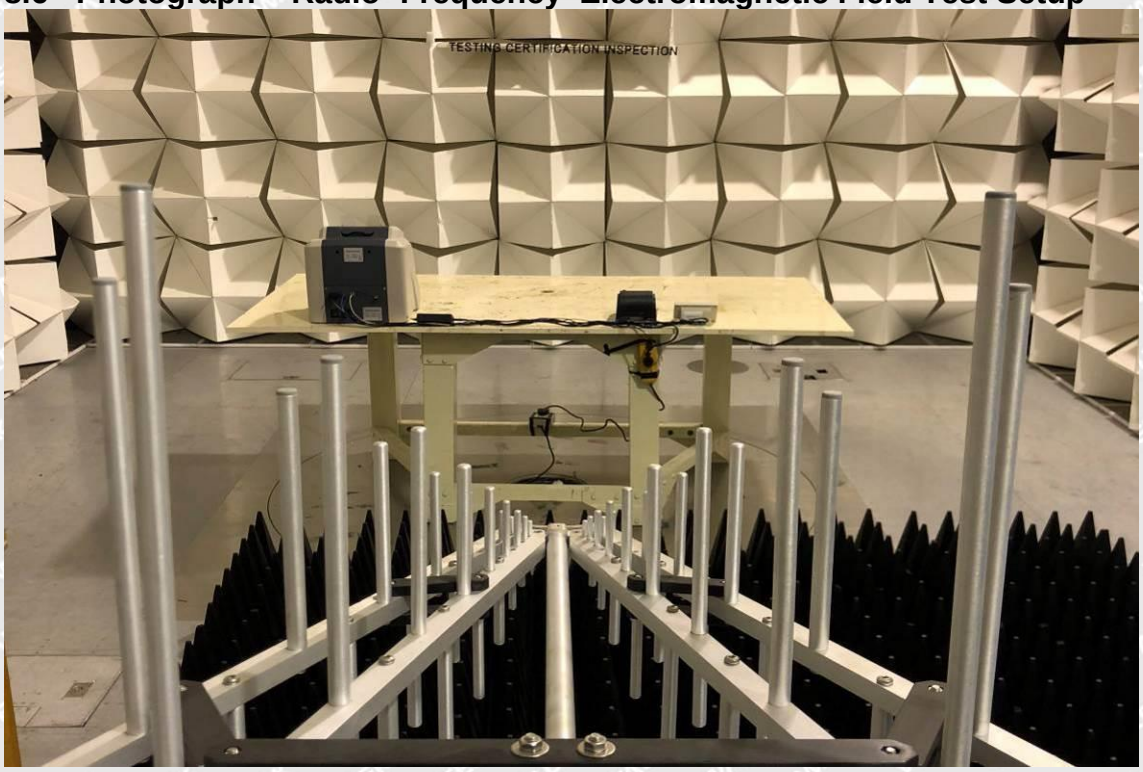
8.3 Photograph – Harmonic Current and Voltage Fluctuation and Flicker Test Setup

8.4 Photograph – ESD Immunity Test Setup



8.5 Photograph – EFT Immunity Test Setup

8.6 Photograph – Radio- Frequency Electromagnetic Field Test Setup



8.7 Photograph – Surge Immunity Test Setup

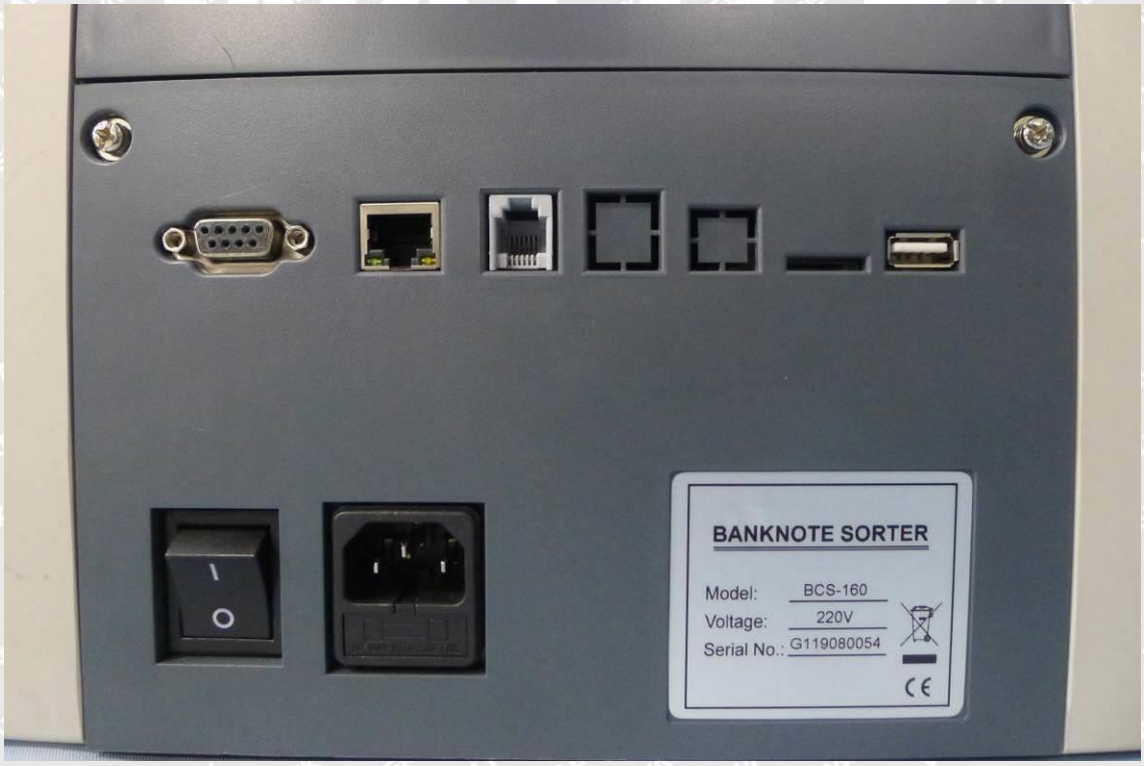
8.8 Photograph – Injected Currents Immunity Test Setup

8.9 Photograph – Power-frequency magnetic Field Test Setup

8.10 Photograph – Voltage Dips and Interruptions Immunity Test Setup

9 Photographs – Constructional Details

9.1 EUT View



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