



EMC TEST REPORT

Reference No..... : WTU16U1164607E
 Applicant..... : barpa
 Address..... : Zona Industrial da Portelinha. Rua António Coelho da Silva, nº75.
 4420-035 S. Cosme, Gondomar – PORTUGAL.
 Manufacturer..... : barpa
 Address..... : Zona Industrial da Portelinha. Rua António Coelho da Silva, nº75.
 4420-035 S. Cosme, Gondomar – PORTUGAL.
 Product Name..... : LCD Console
 Model No..... : 82371117010, 82371117080
 Standards..... : EN 55022:2010
 EN 55024:2010
 EN 61000-3-2:2014
 EN 61000-3-3:2013
 Date of Receipt sample..... : July 10, 2016
 Date of Test..... : July 11, 2016~October 28, 2016
 Date of Issue..... : November 07, 2016
 Test Report Form No..... : EN 55022-1A
 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 55022:2010	Clause 5	Pass	
Radiated Emission, 30MHz to 1000MHz	EN 55022:2010	Clause 6	Pass	
Radiated Emission, Above 1GHz	EN 55022:2010	Clause 6	N/A	
Harmonic Current emission	EN 61000-3-2:2014	Class A	Pass	
Voltage Fluctuation and Flicker	EN61000-3-3:2013	Clause 5	Pass	
IMMUNITY (EN 55024:2010)				
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 61000-4-5:2014	±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	N/A
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



2 Contents

	Page
COVER PAGE	1
1 TEST SUMMARY	2
2 CONTENTS	3
3 GENERAL INFORMATION	5
3.1 GENERAL DESCRIPTION OF E.U.T.	5
3.2 DETAILS OF E.U.T.	5
3.3 DESCRIPTION OF SUPPORT UNITS	5
3.4 STANDARDS APPLICABLE FOR TESTING	5
3.5 TEST FACILITY	6
3.6 SUBCONTRACTED.....	6
3.7 ABNORMALITIES FROM STANDARD CONDITIONS	6
4 EQUIPMENT USED DURING TEST	7
4.1 MEASUREMENT UNCERTAINTY	8
5 EMISSION TEST RESULTS	9
5.1 MAINS TERMINALS DISTURBANCE VOLTAGE, 150 KHZ TO 30MHZ.....	9
5.1.1 <i>E.U.T. Operation</i>	9
5.1.2 <i>Block Diagram of Test Setup</i>	9
5.1.3 <i>Measurement Data</i>	10
5.1.4 <i>Mains Terminals Disturbance Voltage Test Data</i>	10
5.2 RADIATED EMISSION, 30 MHZ TO 1GHZ	12
5.2.1 <i>E.U.T. Operation</i>	12
5.2.2 <i>Block Diagram of Test Setup</i>	12
5.2.3 <i>Measurement Data</i>	13
5.2.4 <i>Radiated Emission Test Data</i>	13
5.3 HARMONICS CURRENT EMISSION.....	15
5.3.1 <i>E.U.T. Operation</i>	15
5.3.2 <i>Block Diagram of Setup</i>	15
5.3.3 <i>Harmonic Current Emission Test Data</i>	16
5.4 VOLTAGE FLUCTUATION AND FLICKER	23
5.4.1 <i>E.U.T. Operation</i>	23
5.4.2 <i>Block Diagram of Setup</i>	23
5.4.3 <i>Voltage Fluctuation and Flicker Test Data</i>	24
6 IMMUNITY TEST RESULTS	25
6.1 PERFORMANCE CRITERIA	25
6.2 ELECTROSTATIC DISCHARGE (ESD).....	25
6.2.1 <i>E.U.T. Operation</i>	26
6.2.2 <i>Block Diagram of Setup</i>	26
6.2.3 <i>Direct Discharge Test Results</i>	26
6.2.4 <i>Indirect Discharge Test Results</i>	27
6.3 ELECTRICAL FAST TRANSIENTS (EFT).....	27
6.3.1 <i>E.U.T. Operation</i>	28
6.3.2 <i>Block Diagram of Setup</i>	28
6.3.3 <i>Test Results</i>	28
6.4 SURGE.....	29
6.4.1 <i>E.U.T. Operation</i>	29
6.4.2 <i>Block Diagram of Setup</i>	29
6.4.3 <i>Test Result</i>	30
6.5 RADIO-FREQUENCY ELECTROMAGNETIC FIELDS, 80MHZ TO 1GHZ	30
6.5.1 <i>E.U.T. Operation</i>	30



6.5.2	Block Diagram of Setup.....	31
6.5.3	Test Results.....	31
6.6	INJECTED CURRENTS IMMUNITY, 0.15MHZ TO 80MHZ.....	32
6.6.1	E.U.T. Operation.....	32
6.6.2	Block Diagram of Setup.....	32
6.6.3	Test Results.....	33
6.7	POWER FREQUENCY MAGNETIC FIELD IMMUNITY	33
6.7.1	E.U.T. Operation.....	33
6.7.2	Block Diagram of Setup.....	34
6.7.3	Test Result.....	34
6.8	VOLTAGE DIPS AND INTERRUPTIONS.....	35
6.8.1	E.U.T. Operation.....	35
6.8.2	Block Diagram of Setup.....	35
6.8.3	Test Results.....	36
7	PHOTOGRAPHS – TEST SETUP	37
7.1	PHOTOGRAPH – MAINS TERMINAL DISTURBANCE VOLTAGE TEST SETUP	37
7.2	PHOTOGRAPH – RADIATED EMISSION TEST SETUP.....	38
7.3	PHOTOGRAPH – HARMONIC CURRENT AND VOLTAGE FLUCTUATION AND FLICKER TEST SETUP	39
7.4	PHOTOGRAPH – ESD IMMUNITY TEST SETUP	39
7.5	PHOTOGRAPH – EFT IMMUNITY TEST SETUP	40
7.6	PHOTOGRAPH – RADIO- FREQUENCY ELECTROMAGNETIC FIELD TEST SETUP	40
7.7	PHOTOGRAPH – SURGE IMMUNITY TEST SETUP.....	41
7.8	PHOTOGRAPH – INJECTED CURRENTS IMMUNITY TEST SETUP.....	41
7.9	PHOTOGRAPH – VOLTAGE DIPS AND INTERRUPTIONS IMMUNITY TEST SETUP	42
8	PHOTOGRAPHS – CONSTRUCTIONAL DETAILS	43
8.1	EUT -FRONT VIEW.....	43
8.2	EUT –BACK VIEW.....	43
8.3	EUT –OPEN VIEW.....	44





3 General Information

3.1 General Description of E.U.T.

Product Name : LCD Console
Model No. : 82371117010, 82371117080
Remark : The difference is only number of ports.

3.2 Details of E.U.T.

Technical Data..... : Input:AC100-240V,50/60Hz

3.3 Description of Support Units

The EUT has been tested as an independent unit. 82371117010 is the test sample. The tests were performed in the condition of AC 230V/50Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55022:2010	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.
EN 55024:2010	Information technology equipment — Immunity characteristics — Limits and methods of measurement.
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:

- **IC – Registration No.: 7760A**

Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

- **FCC – Registration No.: 880581**

Waltek Services (Shenzhen) Co., Ltd. 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.

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.



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4 Equipment Used during Test

<input checked="" type="checkbox"/> Mains Terminal Disturbance Voltage (Conducted Emission)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Test Receiver	ROHDE& SCHWARZ	ESCI	101297	Valid
2.	Two-Line V-Network	ROHDE& SCHWARZ	ENV216	101538	Valid
3.	Manual RF SW	ESE	RSU-A41	-	Valid
4.	3m,50 ohms Cable	HUBER SUHNER	1016873	-	Valid
<input checked="" type="checkbox"/> Harmonics and Flicker Measuring System					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Digital Power Analyzer	Em Test AG	ADP500	V0745103095	Valid
2.	Power Source	Em Test AG	ACS500	V0745103096	Valid
<input checked="" type="checkbox"/> ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Electrostatic Discharge Simulator	TESEQ	NSG 438	1235	Valid
<input checked="" type="checkbox"/> EFT & Voltage Dips and Interruptions					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EFT Simulator	TESEQ	NSG 3040	1982	Valid
2.	Capacitive Coupling Clamp	TESEQ	CDN 3425	1690	Valid
3.	Manual step transformer	TESEQ	INA6501	226	Valid
<input checked="" type="checkbox"/> Surge					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Surge Simulator	TESEQ	NSG3060	1516	Valid
2.	Coupling Decoupling Network	TESEQ	CDN3061-S16	1434	Valid
<input checked="" type="checkbox"/> 10m Semi-anechoic Chamber for Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Test Receiver	ROHDE& SCHWARZ	ESCI	101346	Valid
2.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	580	Valid
3.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	1092	Valid
4.	Broadband Preamplifier	SCHWARZBECK	BBV 9743	0069	Valid
5.	8m 50 Ohm Coaxial Cable with N-plug	HUBER SUHNER	1016873	-	Valid
6.	10m 50 Ohm Coaxial Cable with N-plug	HUBER SUHNER	1016873	-	Valid



<input checked="" type="checkbox"/> Radio-frequency electromagnetic fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Signal Generator	ROHDE&SCHWARZ	SMB100A-B106	105942	Valid
2.	RF- amplifier	B0NN Elektronik	BLWA	128740	Valid
3.	Power meter	ROHDE&SCHWARZ	SMB 100A	102031	Valid
4.	Broad-band Horn Antenna	SCHWARZBECK	STLP 9128D	043	Valid
<input checked="" type="checkbox"/> Injected Currents					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	RF generator	TESEQ	NSG4070	35088	Valid
2.	Power Amplifier	TESEQ	CBA 400M-110	T44225	Valid
3.	EM Clamp	TESEQ	KEMZ801A	33477	Valid
4.	Coupling Decoupling Network	TESEQ	CDN M016	34615	Valid
5.	Dual Directional Coupler	TESEQ	DCP 0100A	34574	Valid
<input type="checkbox"/> Power Frequency Magnetic Field					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Power Frequency Magnetic Field generator	EVERFINE	EMS61000-8k	11030002	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Radiated Emission	30MHz~1GHz	±5.03dB	(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, 150 kHz to 30MHz

Test Requirement.....	: EN 55022
Test Method.....	: Clause 9 of EN 55022
Test Result.....	: Pass
Frequency Range.....	: 150kHz to 30MHz
Class/Severity	: Table 2 of EN 55022

5.1.1 E.U.T. Operation

Operating Environment:

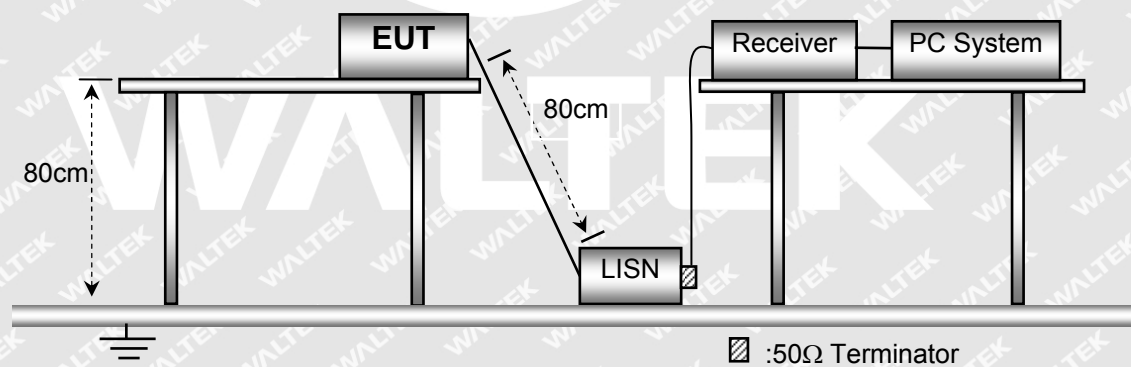
Temperature	: 23°C
Humidity.....	: 65%RH
Atmospheric Pressure.....	: 100.3kPa

EUT Operation:

Input Voltage	: AC230V/50Hz
Operating Mode.....	: Max power mode
Classification.....	: ClassB

5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the EN 55022.



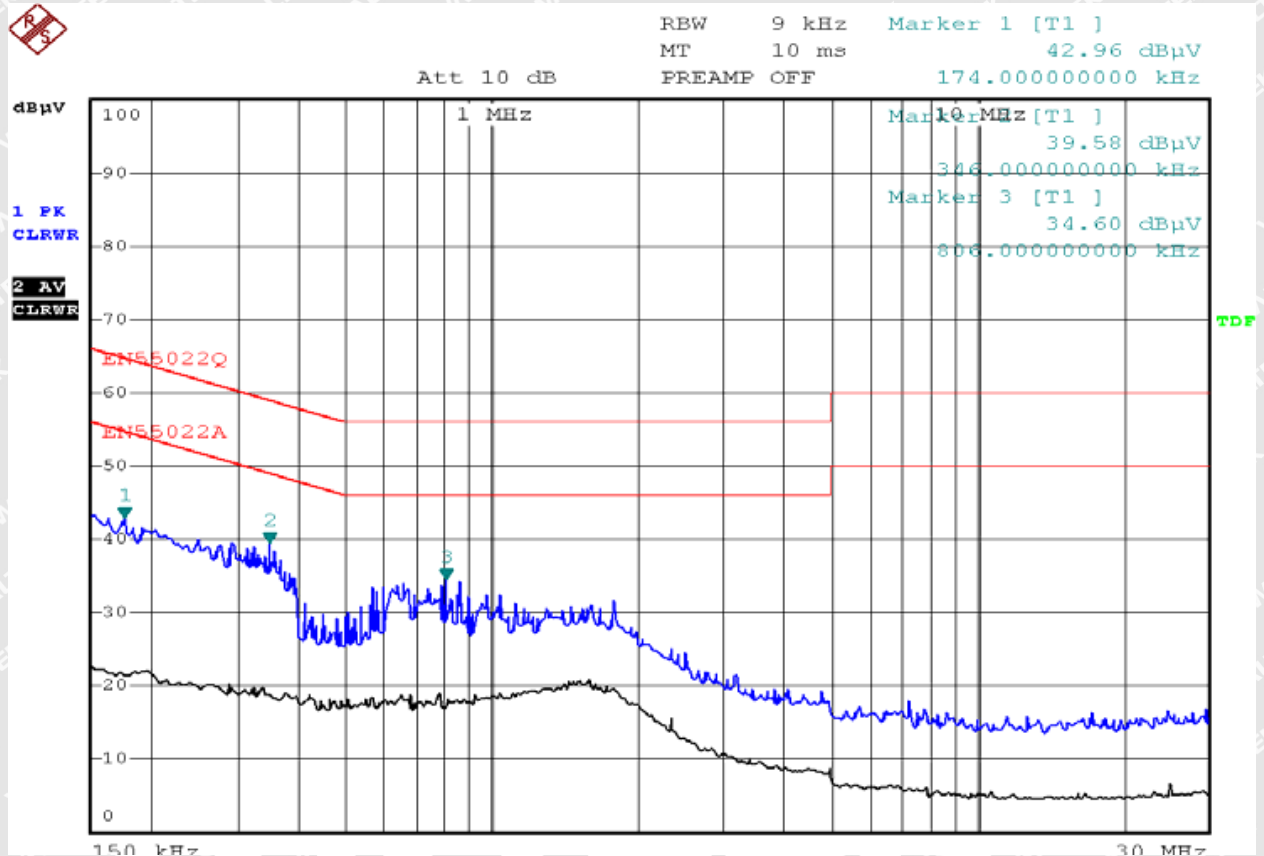


5.1.3 Measurement Data

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.

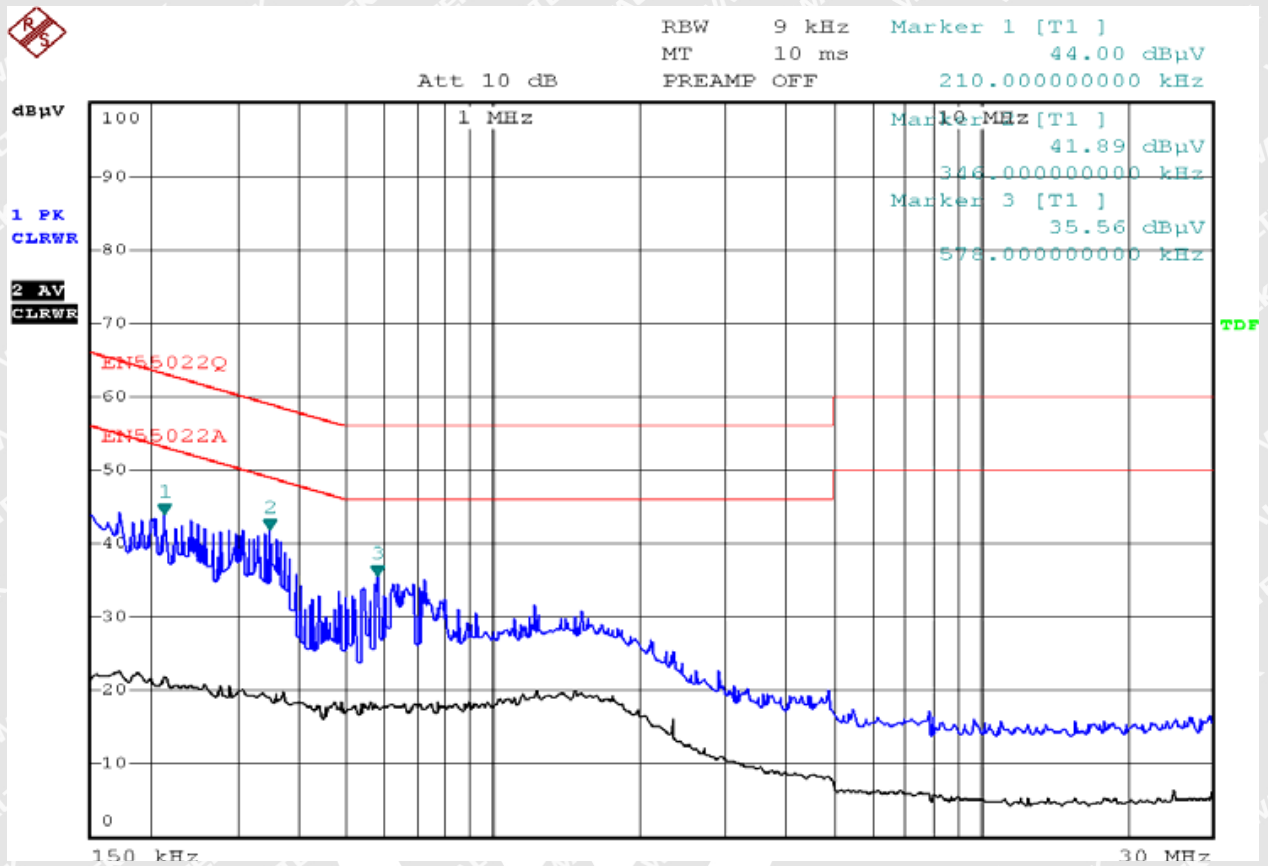
5.1.4 Mains Terminals Disturbance Voltage Test Data

Live Line :





Neutral Line:



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5.2 Radiated Emission, 30 MHz to 1GHz

Test Requirement..... : EN 55022
 Test Method..... : EN 55022
 Test Result..... : Pass
 Frequency Range..... : 30MHz to 1GHz
 Class/Severity : Table 6 of EN 55022:2010

5.2.1 E.U.T. Operation

Operating Environment:

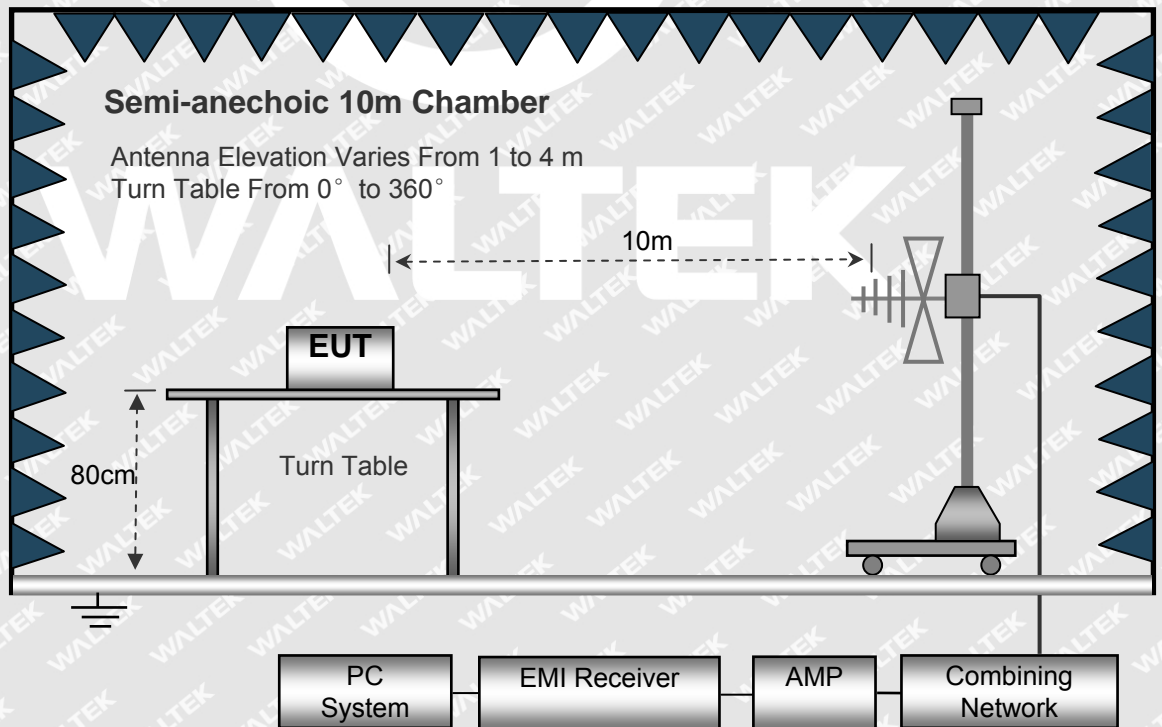
Temperature..... : 23°C
 Humidity..... : 65%RH
 Atmospheric Pressure..... : 100.3kPa

EUT Operation:

Input Voltage..... : AC230V/50Hz
 Operating Mode..... : Max power mode
 Classification..... : ClassB

5.2.2 Block Diagram of Test Setup

The Radiated Emission test was performed in the 10m Semi- Anechoic Chamber test site and accordance with EN 55022.



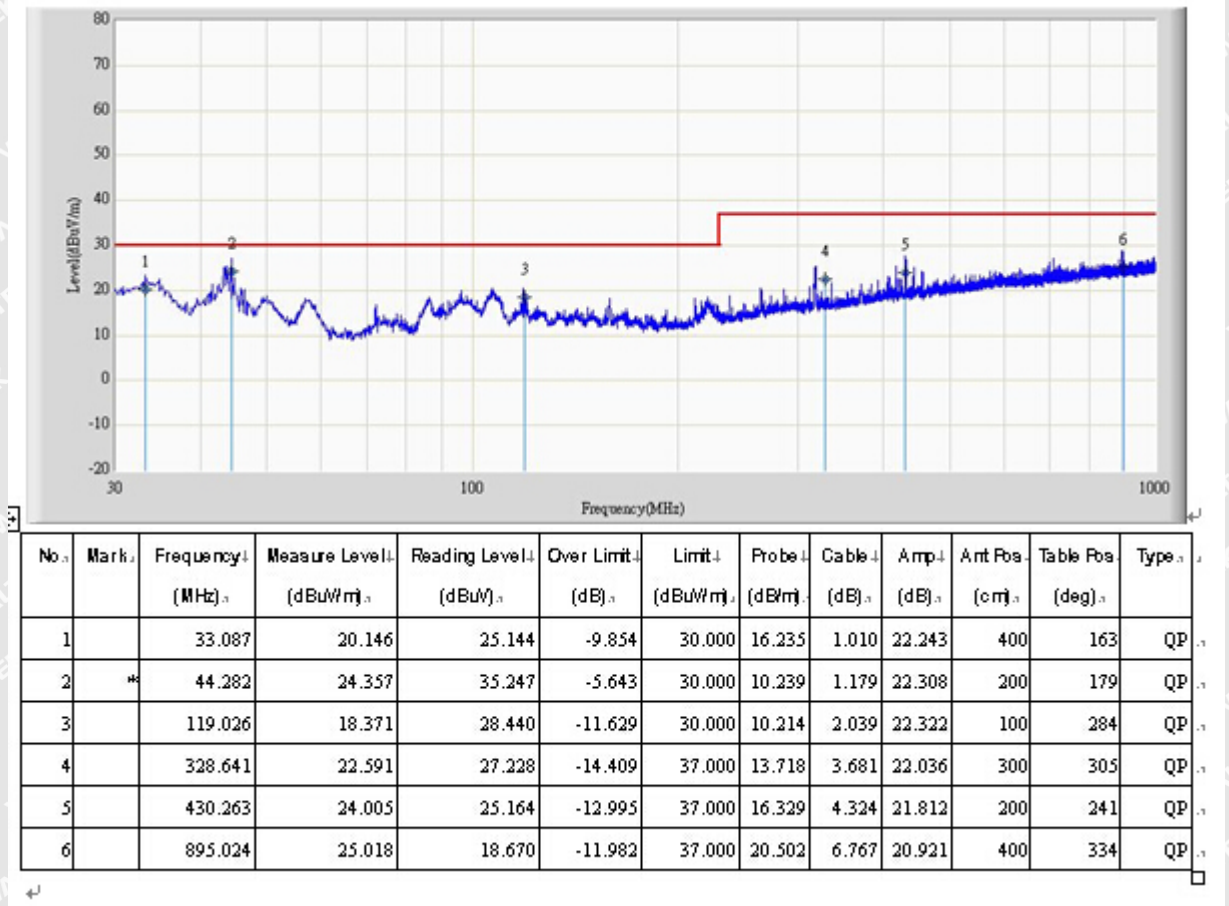


5.2.3 Measurement Data

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.

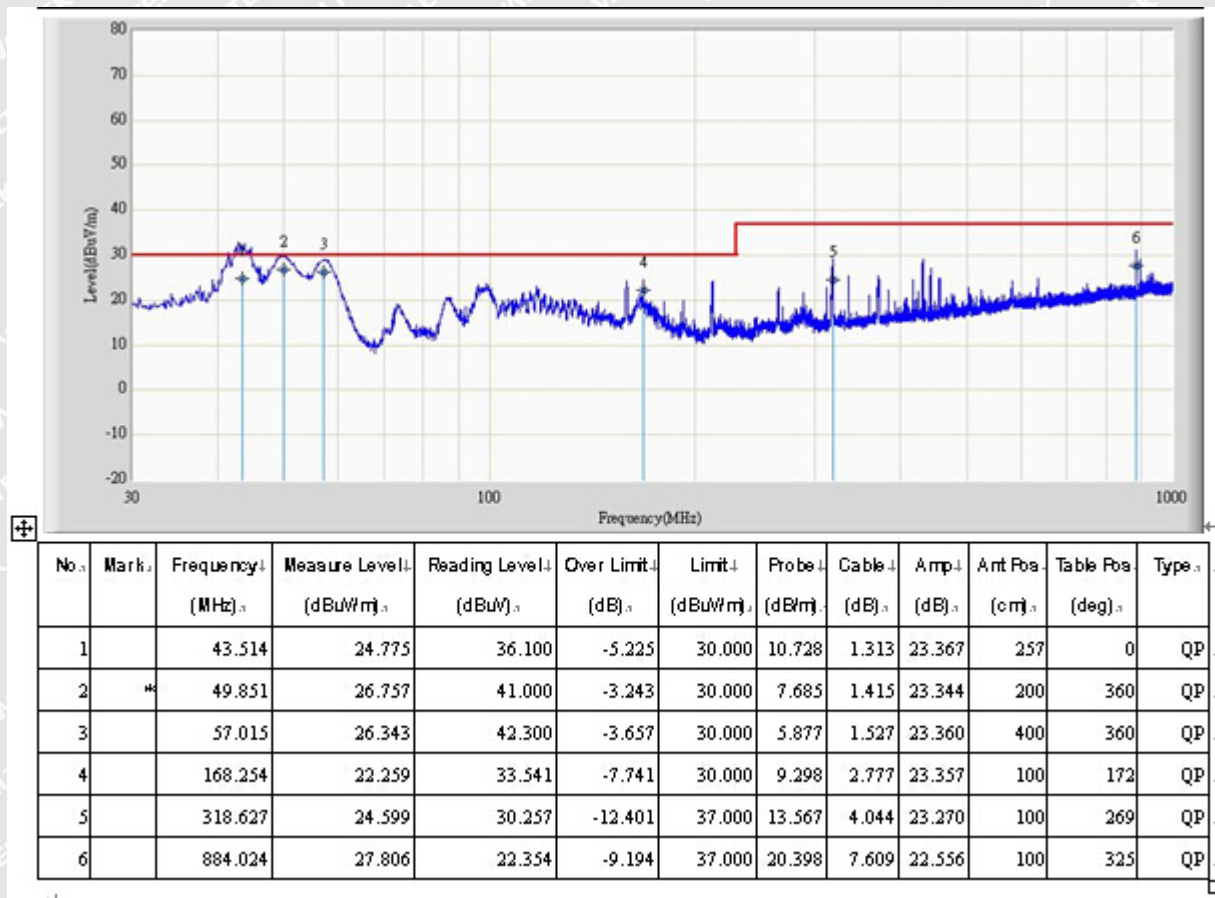
5.2.4 Radiated Emission Test Data

Horizontal Polarization:





Vertical Polarization :





5.3 Harmonics Current Emission

Test Requirement..... : EN 55022
Test Method..... : EN61000-3-2
Test Result..... : Pass
Class/Severity : Class A

5.3.1 E.U.T. Operation

Operating Environment:

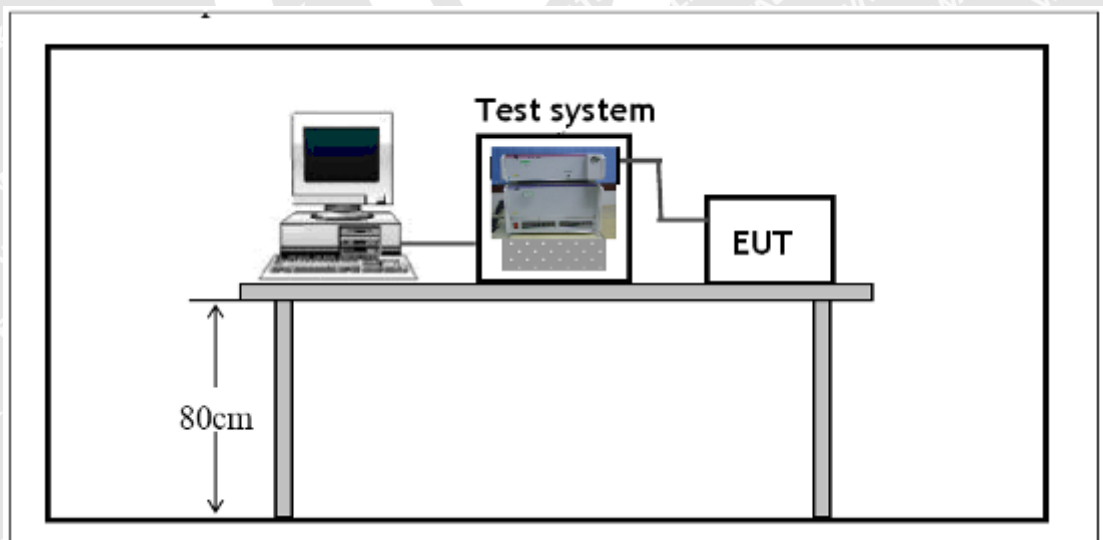
Temperature : 23°C
Humidity..... : 65%RH
Barometric Pressure..... : 100.3kPa

EUT Operation:

Input Voltage : AC 230V/50Hz
Operating Mode..... : Max power mode

5.3.2 Block Diagram of Setup

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





5.3.3 Harmonic Current Emission Test Data

Test Report

Report title:	Harmonic current Test
Company Name:	Waltek
Measurement file name:	Harmonics_3_2_Ed3.rsd
Tester:	caidy
Standard used:	EN/IEC 61000-3-2 Ed.3 Short cyclic Equipment class A \leq 150% of the limit
Observation time:	150s
Windows width:	10 periods - (EN/IEC 61000-4-7 Edition 2002)
Customer:	/
E. U. T.:	LCD Console

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E. U. T. Result

Check harmonics 2..40 [exception odd 21..39]:

Harmonic(s) > 150%:

Order (n): None

Harmonic(s) with average > 100%:

Order (n): None

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.

Harmonic(s) > 150%:

Order (n): None

Harmonic(s) with average > 150%:

Order (n): None

Power Source Result

First dataset out of limit:

DS (time): None

Harmonic(s) out of limit:

Order (n): None



Average harmonic current results				
Hn	I _{eff} [A]	I _{eff} [%]	Limit [A]	Result
1	103.655E-3	100.000		
2	1.163E-3	1.122	1.08	PASS
3	87.660E-3	84.603	2.30	PASS
4	2.855E-3	2.756	430.00E-3	PASS
5	77.690E-3	74.981	1.14	PASS
6	1.123E-3	1.084	300.00E-3	PASS
7	63.468E-3	61.255	770.00E-3	PASS
8	1.182E-3	1.141	230.00E-3	PASS
9	46.816E-3	45.183	400.00E-3	PASS
10	1.103E-3	1.064	184.00E-3	PASS
11	31.872E-3	30.760	330.00E-3	PASS
12	904.199E-6	0.873	153.33E-3	PASS
13	18.763E-3	18.108	210.00E-3	PASS
14	958.107E-6	0.925	131.43E-3	PASS
15	10.763E-3	10.388	150.00E-3	PASS
16	987.307E-6	0.953	115.00E-3	PASS
17	10.822E-3	10.445	132.35E-3	PASS
18	933.506E-6	0.901	102.22E-3	PASS
19	12.425E-3	11.992	118.42E-3	PASS
20	694.749E-6	0.671	92.00E-3	PASS
21	12.784E-3	12.338	160.71E-3	PASS
22	1.016E-3	0.980	83.64E-3	PASS
23	11.368E-3	10.971	146.74E-3	PASS
24	685.514E-6	0.662	76.66E-3	PASS
25	9.229E-3	8.907	135.00E-3	PASS
26	961.725E-6	0.928	70.77E-3	PASS
27	8.282E-3	7.993	124.99E-3	PASS
28	640.658E-6	0.618	65.71E-3	PASS
29	8.705E-3	8.401	116.39E-3	PASS
30	870.281E-6	0.840	61.33E-3	PASS
31	9.602E-3	9.267	108.87E-3	PASS
32	634.504E-6	0.612	57.50E-3	PASS
33	9.583E-3	9.249	102.27E-3	PASS
34	796.178E-6	0.768	54.12E-3	PASS
35	8.976E-3	8.663	96.44E-3	PASS
36	615.072E-6	0.594	51.11E-3	PASS
37	7.326E-3	7.071	91.21E-3	PASS
38	594.111E-6	0.573	48.42E-3	PASS
39	6.140E-3	5.925	86.53E-3	PASS
40	622.534E-6	0.601	46.00E-3	PASS



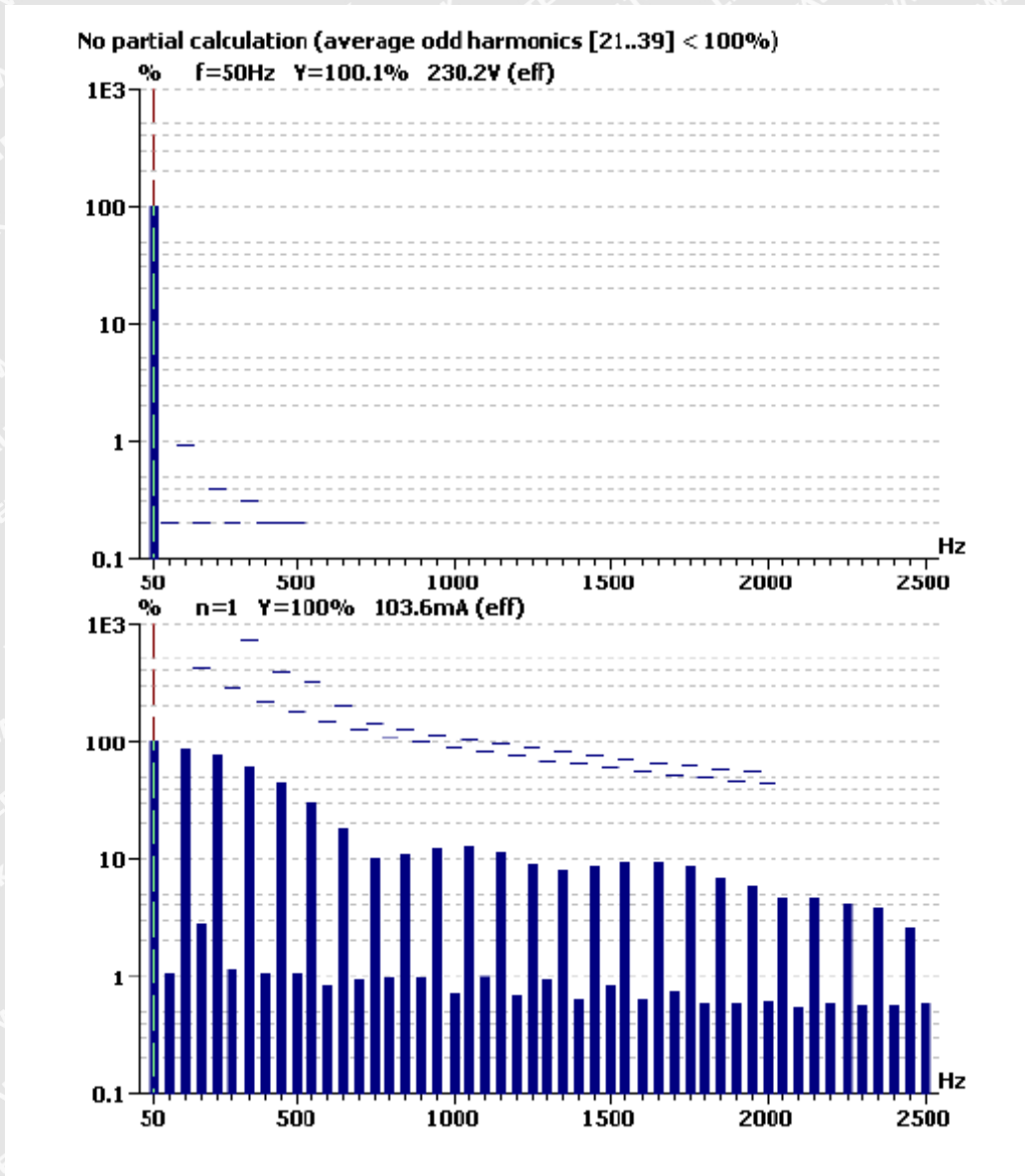
Maximum harmonic current results

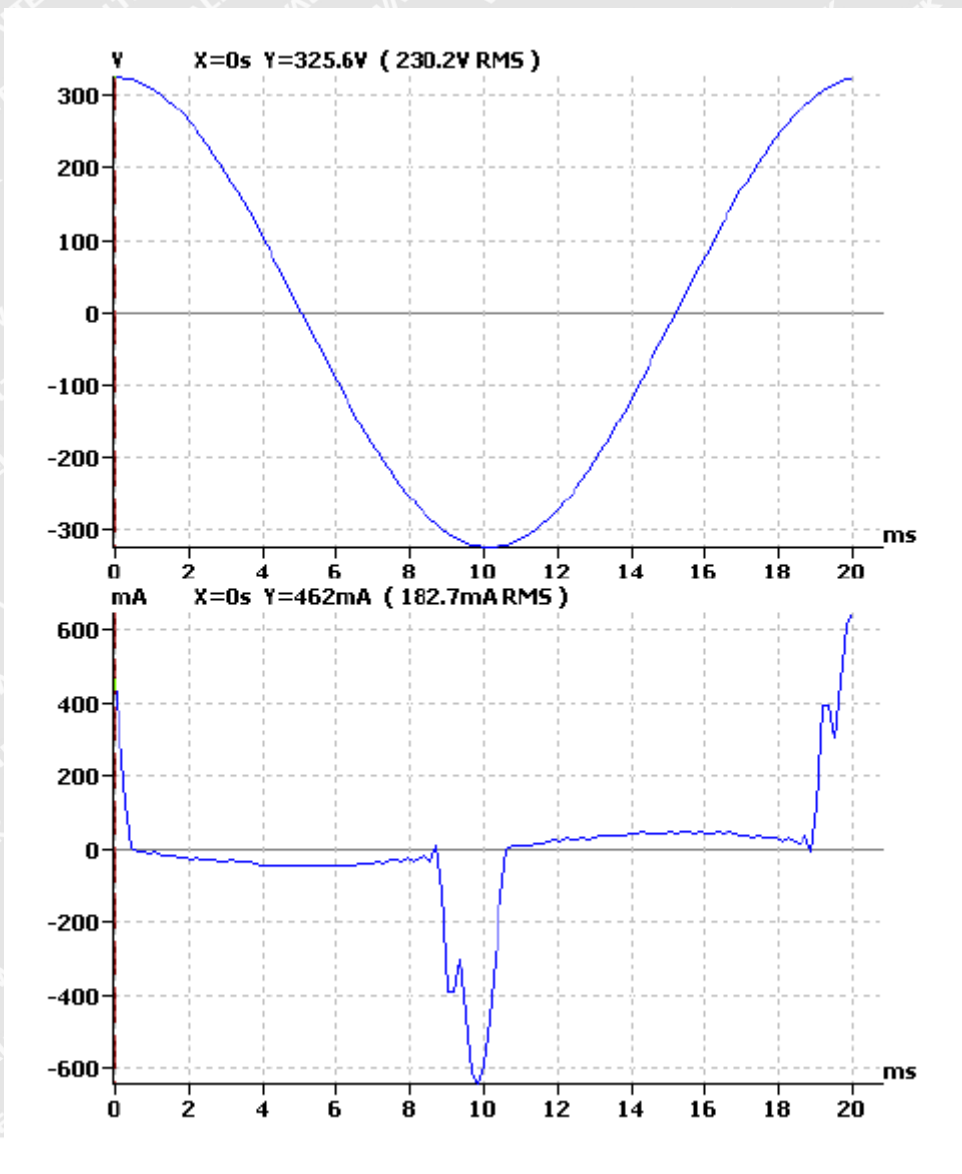
Hn	I _{eff} [A]	I _{eff} [%]	Limit [A]	Result
1	104.781E-3	100.000		
2	1.355E-3	1.294	1.62	PASS
3	88.089E-3	84.070	3.45	PASS
4	3.085E-3	2.944	645.00E-3	PASS
5	78.006E-3	74.446	1.71	PASS
6	1.309E-3	1.249	450.00E-3	PASS
7	63.738E-3	60.830	1.15	PASS
8	1.322E-3	1.261	345.00E-3	PASS
9	47.183E-3	45.030	600.00E-3	PASS
10	1.279E-3	1.221	276.00E-3	PASS
11	32.368E-3	30.891	495.00E-3	PASS
12	1.065E-3	1.016	229.99E-3	PASS
13	19.344E-3	18.461	315.00E-3	PASS
14	1.089E-3	1.040	197.15E-3	PASS
15	11.054E-3	10.550	225.00E-3	PASS
16	1.098E-3	1.048	172.50E-3	PASS
17	11.404E-3	10.884	198.52E-3	PASS
18	1.076E-3	1.027	153.33E-3	PASS
19	13.061E-3	12.465	177.63E-3	PASS
20	768.954E-6	0.734	138.00E-3	PASS
21	13.299E-3	12.692	160.71E-3	PASS
22	1.181E-3	1.127	125.46E-3	PASS
23	11.749E-3	11.212	146.74E-3	PASS
24	752.254E-6	0.718	114.99E-3	PASS
25	9.473E-3	9.041	135.00E-3	PASS
26	1.044E-3	0.997	106.16E-3	PASS
27	8.565E-3	8.175	124.99E-3	PASS
28	717.142E-6	0.684	98.57E-3	PASS
29	9.012E-3	8.601	116.39E-3	PASS
30	947.862E-6	0.905	92.00E-3	PASS
31	9.841E-3	9.392	108.87E-3	PASS
32	711.446E-6	0.679	86.25E-3	PASS
33	9.713E-3	9.270	102.27E-3	PASS
34	887.858E-6	0.847	81.18E-3	PASS
35	9.129E-3	8.713	96.44E-3	PASS
36	700.140E-6	0.668	76.66E-3	PASS
37	7.522E-3	7.179	91.21E-3	PASS
38	648.720E-6	0.619	72.63E-3	PASS
39	6.359E-3	6.068	86.53E-3	PASS
40	703.834E-6	0.672	69.00E-3	PASS



Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.16	100.072		
2	82.55E-3	0.036	0.2	PASS
3	109.45E-3	0.048	0.9	PASS
4	14.96E-3	0.007	0.2	PASS
5	44.38E-3	0.019	0.4	PASS
6	11.44E-3	0.005	0.2	PASS
7	25.26E-3	0.011	0.3	PASS
8	11.16E-3	0.005	0.2	PASS
9	64.19E-3	0.028	0.2	PASS
10	15.37E-3	0.007	0.2	PASS
11	69.11E-3	0.030	0.1	PASS
12	17.46E-3	0.008	0.1	PASS
13	19.09E-3	0.008	0.1	PASS
14	14.94E-3	0.006	0.1	PASS
15	59.66E-3	0.026	0.1	PASS
16	11.46E-3	0.005	0.1	PASS
17	78.29E-3	0.034	0.1	PASS
18	12.47E-3	0.005	0.1	PASS
19	40.20E-3	0.017	0.1	PASS
20	10.69E-3	0.005	0.1	PASS
21	36.10E-3	0.016	0.1	PASS
22	13.28E-3	0.006	0.1	PASS
23	69.55E-3	0.030	0.1	PASS
24	13.16E-3	0.006	0.1	PASS
25	50.46E-3	0.022	0.1	PASS
26	10.61E-3	0.005	0.1	PASS
27	32.64E-3	0.014	0.1	PASS
28	8.35E-3	0.004	0.1	PASS
29	37.06E-3	0.016	0.1	PASS
30	9.72E-3	0.004	0.1	PASS
31	55.04E-3	0.024	0.1	PASS
32	7.80E-3	0.003	0.1	PASS
33	33.29E-3	0.014	0.1	PASS
34	6.93E-3	0.003	0.1	PASS
35	38.42E-3	0.017	0.1	PASS
36	6.45E-3	0.003	0.1	PASS
37	34.02E-3	0.015	0.1	PASS
38	7.80E-3	0.003	0.1	PASS
39	41.93E-3	0.018	0.1	PASS
40	7.40E-3	0.003	0.1	PASS





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5.4 Voltage Fluctuation and Flicker

Test Requirement : EN 55022

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

Test Result : Pass

5.4.1 E.U.T. Operation

Operating Environment:

Temperature : 23°C

Humidity..... : 65%RH

Barometric Pressure..... : 100.3kPa

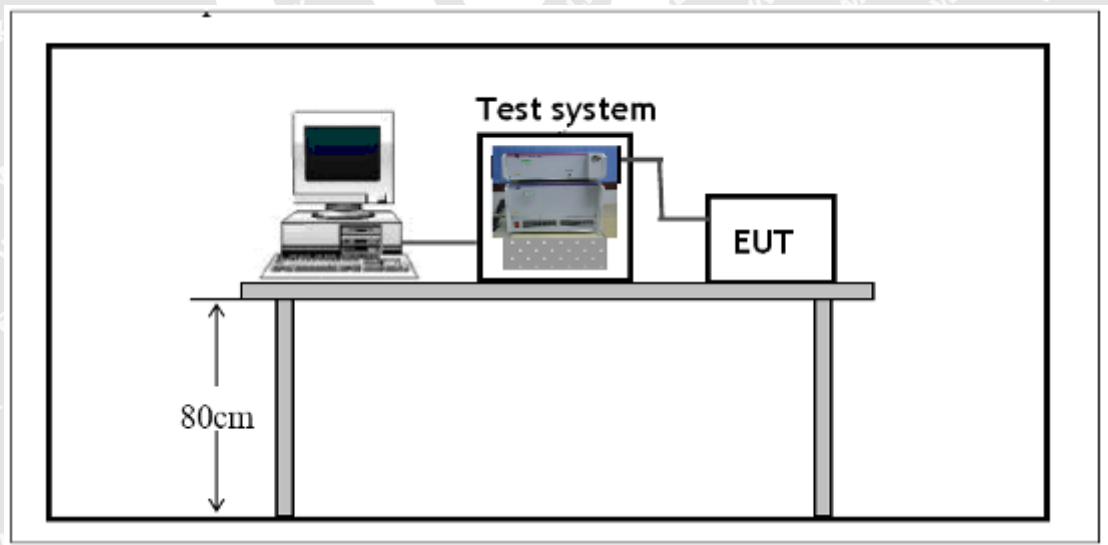
EUT Operation:

Input Voltage : AC 230V/50Hz

Operating Mode..... : Max power mode

5.4.2 Block Diagram of Setup

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





5.4.3 Voltage Fluctuation and Flicker Test Data

Company Name:	Waltek Services
Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 Min (1 Flicker Measurement)
Customer:	/
E. U. T.:	LCD Console AC 230V,50Hz

Test Result	PASS
-------------	------

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
dc [%]	0.004	3.30	PASS
dmax [%]	0.163	4.00	PASS
dt [s]	0.000	0.50	PASS



6 Immunity Test Results

6.1 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.

6.2 Electrostatic Discharge (ESD)

Test Requirement	:	EN 55024
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:

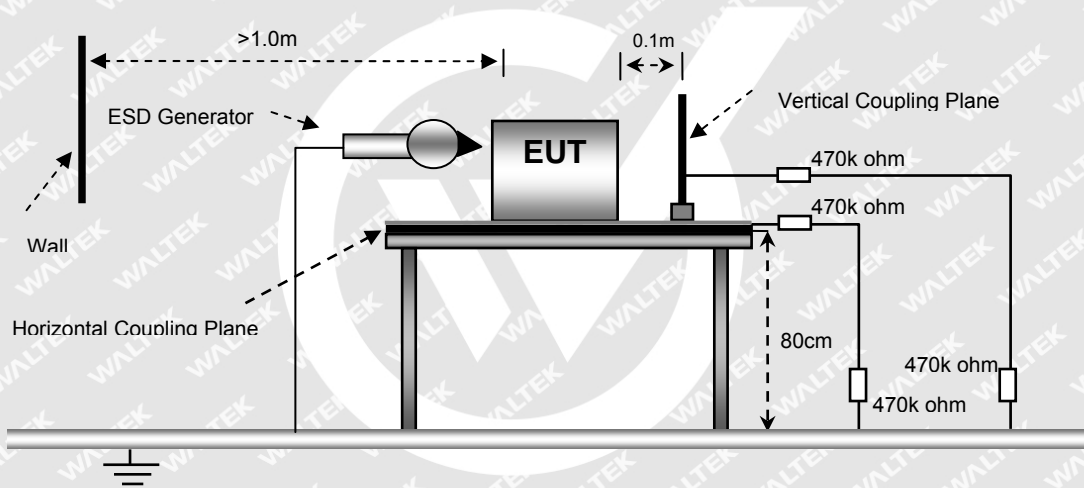
Temperature : 23°C
 Humidity : 48%RH
 Barometric Pressure : 100.3kPa

EUT Operation:

Input Voltage : AC 230V/50Hz
 Operating Mode..... : Max power mode

6.2.2 Block Diagram of Setup

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



The ESD test was performed in accordance with 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 Electrical Fast Transients (EFT)

Test Requirement..... : EN 55024
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

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6.3.1 E.U.T. Operation

Operating Environment:

- Temperature : 23°C
- Humidity : 65%RH
- Barometric Pressure..... : 100.3kPa

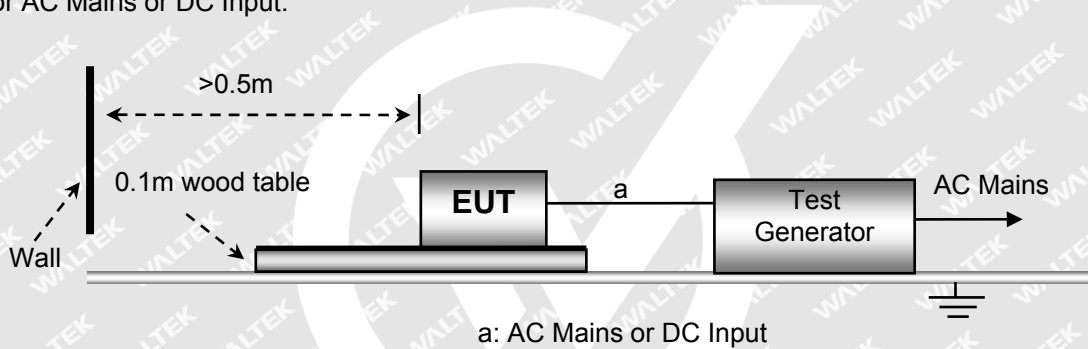
EUT Operation:

- Input Voltage : AC 230V/50Hz
- Operating Mode : Max power mode

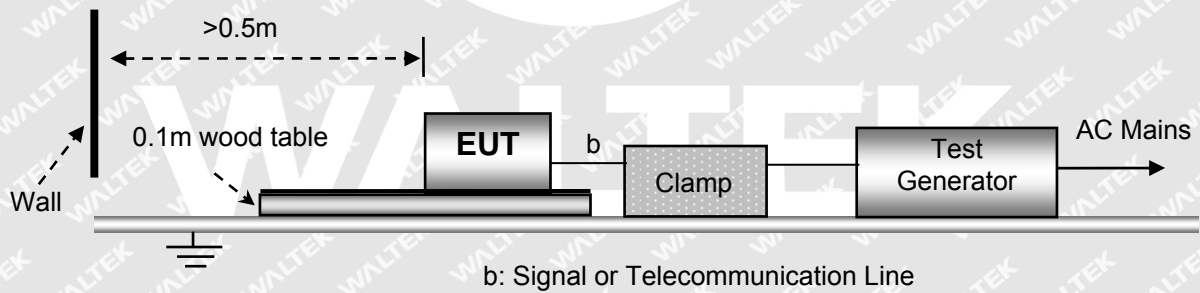
6.3.2 Block Diagram of Setup

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

For AC Mains or DC Input:



For Signal or Telecommunication Port:



6.3.3 Test 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)



6.4 Surge

- Test Requirement..... : EN 55024
- 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 0°, 90°, 180° and at 270°

6.4.1 E.U.T. Operation

Operating Environment:

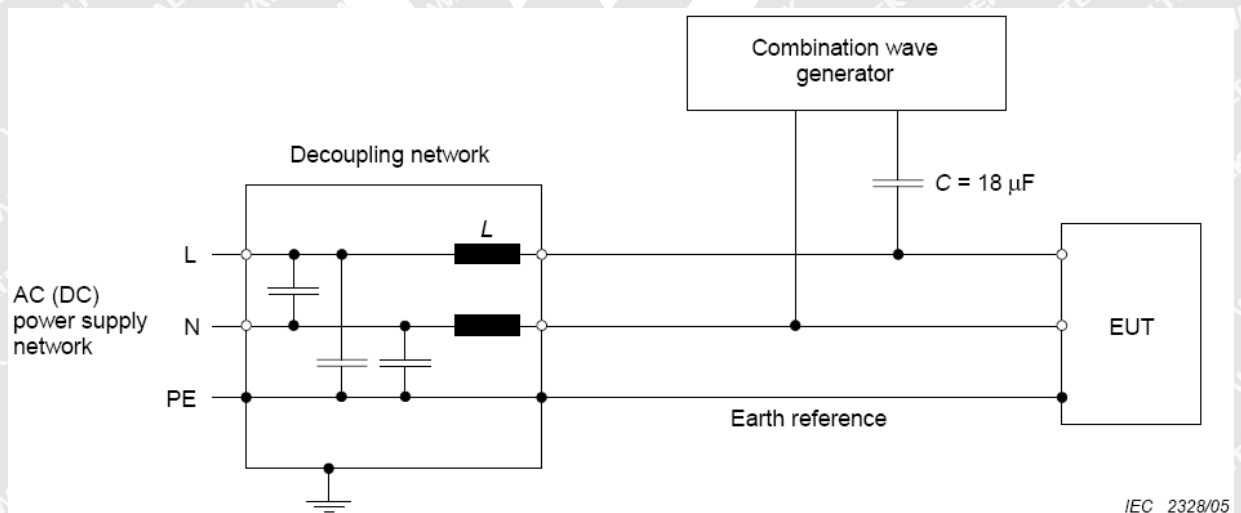
- Temperature..... : 23°C
- Humidity..... : 65%RH
- Barometric Pressure..... : 100.3kPa

EUT Operation:

- Input Voltage..... : AC 230V/50Hz
- Operating Mode..... : Max power mode

6.4.2 Block Diagram of Setup

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





6.4.3 Test 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)

6.5 Radio-frequency electromagnetic fields, 80MHz to 1GHz

Test Requirement	: EN 55024
Test Method	: IEC 61000-4-3
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

6.5.1 E.U.T. Operation

Operating Environment:

Temperature.....	: 23°C
Humidity	: 65%RH
Barometric Pressure.....	: 100.3kPa

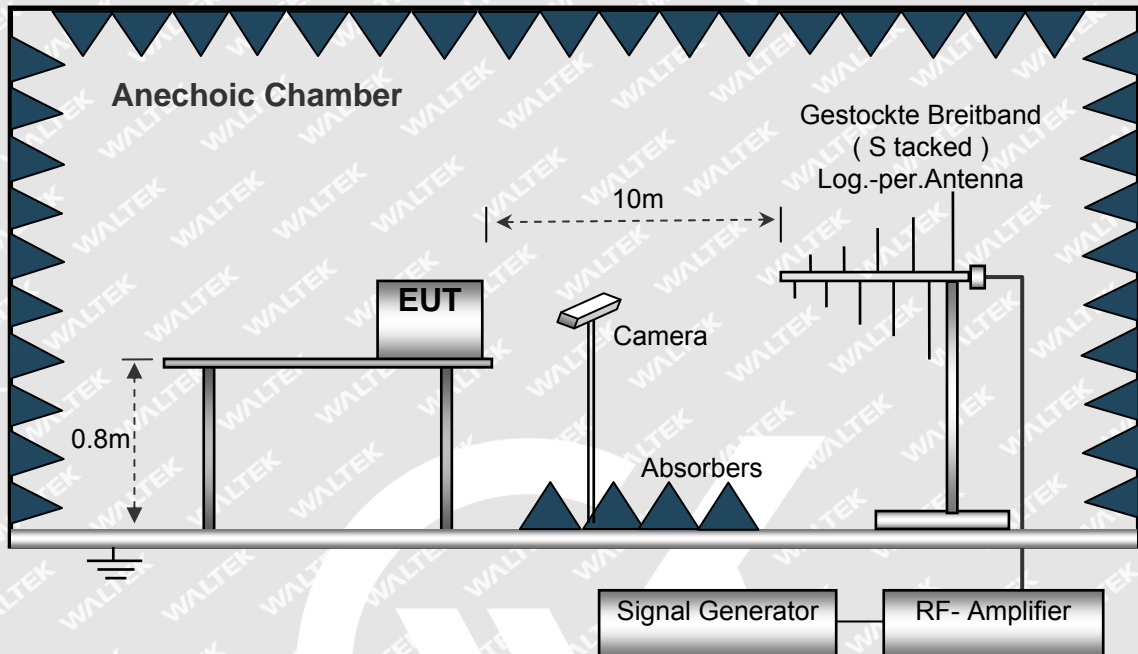
EUT Operation:

Input Voltage.....	: AC 230V/50Hz
Operating Mode.....	: Max power mode



6.5.2 Block Diagram of Setup

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



6.5.3 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*

Remark:

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



6.6 Injected Currents Immunity, 0.15MHz to 80MHz

Test Requirement	:	EN 55024
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.

6.6.1 E.U.T. Operation

Operating Environment:

Temperature	:	23.0°C
Humidity	:	54.3% RH
Barometric Pressure	:	101.5kPa

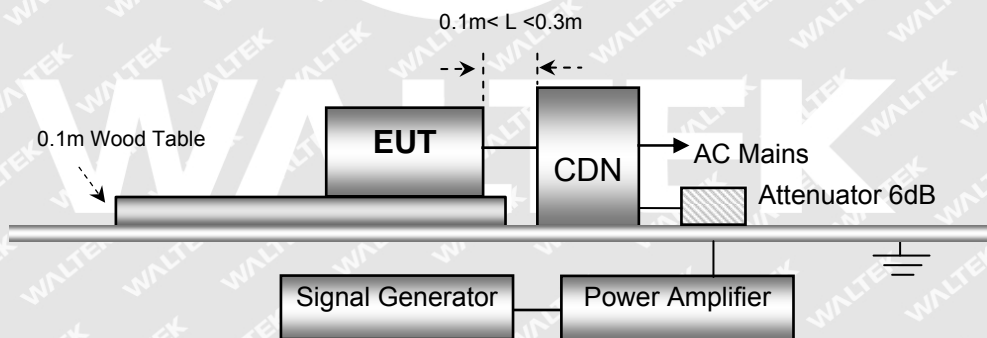
EUT Operation:

Input Voltage	:	AC 230V/50Hz
Operating Mode	:	Max power mode

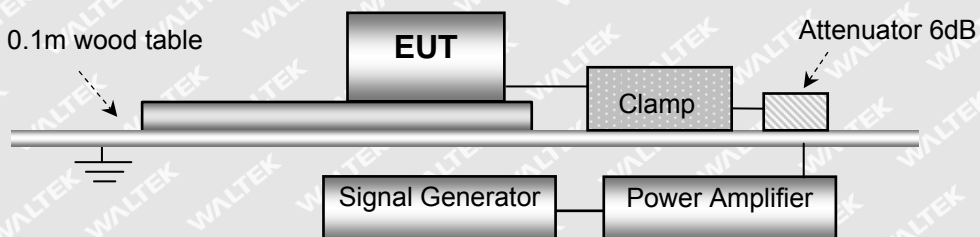
6.6.2 Block Diagram of Setup

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:





6.6.3 Test 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*
0.15MHz to 80MHz	2 Wire DC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	N/A
0.15MHz to 80MHz	Signal Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	N/A

Remark:

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

6.7 Power Frequency Magnetic Field Immunity

Test Requirement : EN 55024
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

6.7.1 E.U.T. Operation

Operating Environment:

Temperature : 23°C
Humidity : 65%RH
Barometric Pressure : 100.3kPa

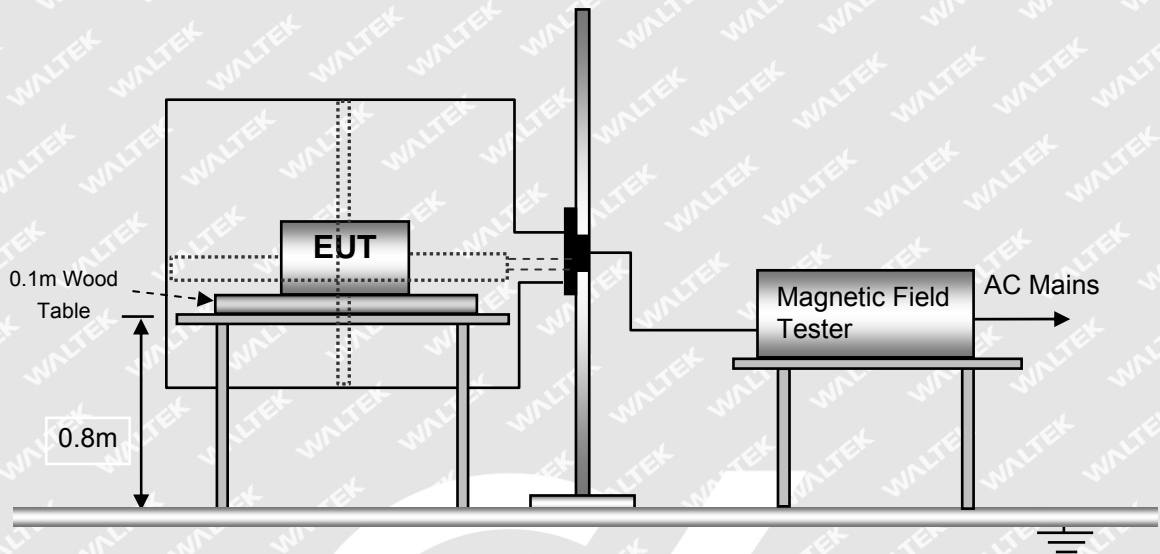
EUT Operation:

Input Voltage : AC 230V/50Hz
Operating Mode : Max power mode



6.7.2 Block Diagram of Setup

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



6.7.3 Test Result

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

Remark:

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



6.8 Voltage Dips and Interruptions

Test Requirement.....	EN 55024
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

6.8.1E.U.T. Operation

Operating Environment:

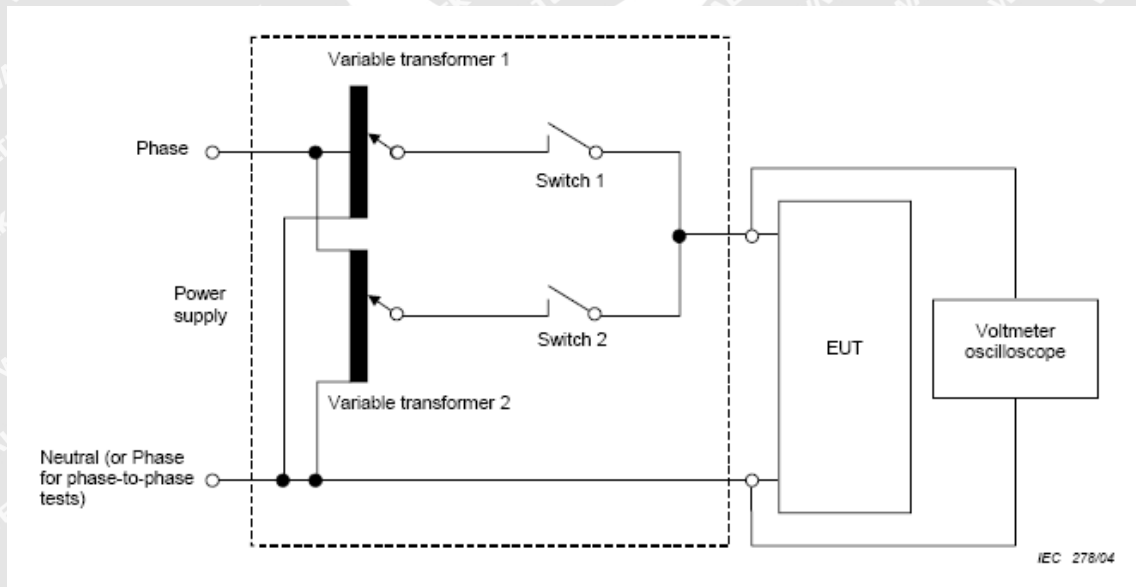
Temperature.....	23°C
Humidity.....	65%RH
Barometric Pressure.....	100.3kPa

EUT Operation:

Input Voltage.....	AC 230V/50Hz
Operating Mode.....	Max power mode

6.8.2 Block Diagram of Setup

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





6.8.3 Test Results

Test Item	Test Level in %U _T	Performance criterion	50Hz		50Hz	
			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)



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7 Photographs – Test Setup

7.1 Photograph – Mains Terminal Disturbance Voltage Test Setup



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7.2 Photograph – Radiated Emission Test Setup





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



7.4 Photograph – ESD Immunity Test Setup





7.5 Photograph – EFT Immunity Test Setup



7.6 Photograph – Radio-Frequency Electromagnetic Field Test Setup





7.7 Photograph – Surge Immunity Test Setup



7.8 Photograph – Injected Currents Immunity Test Setup





7.9 Photograph – Voltage Dips and Interruptions Immunity Test Setup



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8 Photographs – Constructional Details

8.1 EUT -Front View

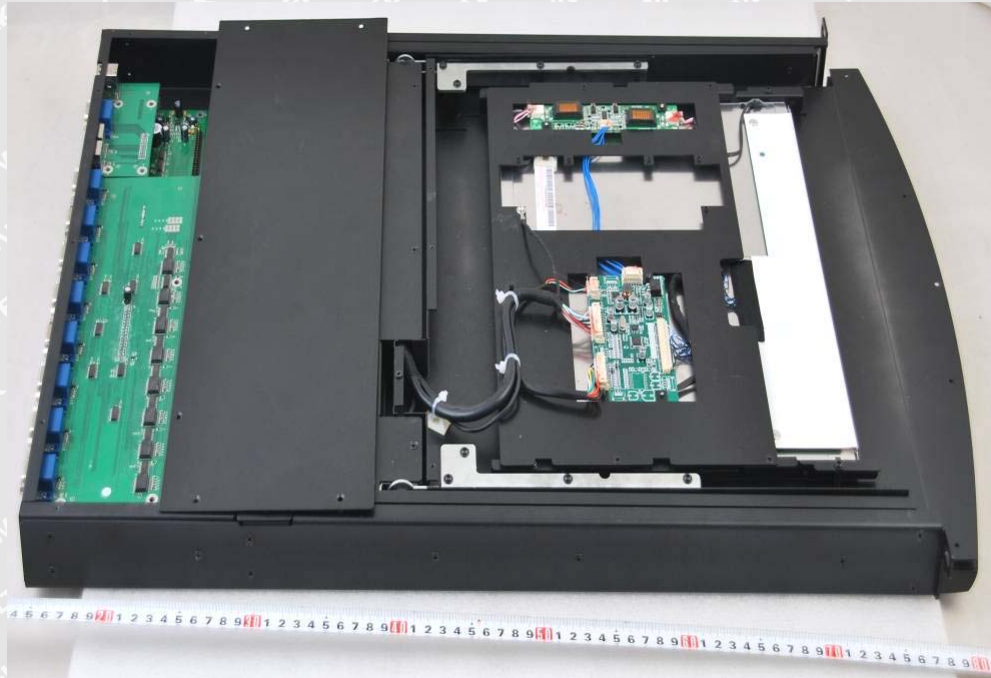


8.2 EUT –Back View





8.3 EUT –Open View



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

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