

# TEST REPORT

EMC DIRECTIVE  
2004/108/EC

REPORT NO. : STDGZ-01724-E



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## TEST REPORT

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## TEST REPORT

### 1 GENERAL INFORMATION

#### 1.1 DETAILS OF APPLICANT

**Name :** NETION ELECTRONEC CO., LTD.  
**Address :** FANHU INDUSTRIAL PARK, LEPING TOWN, SANSHUI BOROUGH,  
FOSHAN CITY, GUANGDONG, CHINA  
**Telephone :** +86-0757-87360181  
**Fax :** +86-0757-87360189  
**Contact :** YANG JIHAN  
**Telephone :** +86-0757-87360181

#### 1.2 DETAILS OF APPROVAL HOLDER

**Name :** NETION ELECTRONEC CO., LTD.  
**Address :** FANHU INDUSTRIAL PARK, LEPING TOWN, SANSHUI BOROUGH,  
FOSHAN CITY, GUANGDONG, CHINA  
**Telephone :** +86-0757-87360181  
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#### 1.3 DESCRIPTION OF THE TEST ITEM

**Name of product:** High-Frequency On-Line UPS (Digital Series)  
**Model No:** 3D10KS  
**Brand Name:** /  
**Technical Parameter:** AC 220V 50Hz

#### 1.4 TEST CONCLUSION

The submitted test sample complied with test standards as listed.

Tested by:

*Elvite W*

Date:

Nov 23, 2009



## TEST REPORT

### 2 TEST RESULTS SUMMARY

	<b>Test Emission / Immunity</b>	<b>Test Result</b>
Conducted Emission	EN 62040-2: 2006	Pass
Radiated Emission	EN 62040-2: 2006	Pass
Harmonics Current	EN 61000 - 3 - 2: 2006	Pass
Electrostatic Discharge Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 2:2009)	Pass
Radiated Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 3: 2006+A1:2008)	Pass
Electrical Fast Transient/Burst Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 4: 2004)	Pass
Surge Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 5: 2006)	Pass
RF continues conducted Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 6: 2009)	Pass
Power Frequency Magnetic Field Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 8: 2001)	Pass
Voltage dips and Interruptions Immunity	EN 62040-2: 2006 (EN 61000 - 4 - 11: 2004)	Pass
low-frequency signals Immunity	EN 62040-2: 2006 (EN 61000 - 2 - 2: 2002)	Pass

## TEST REPORT

### 3 TEST METHOD AND DATA

#### 3.1 CONDUCTED EMISSION MEASUREMENT

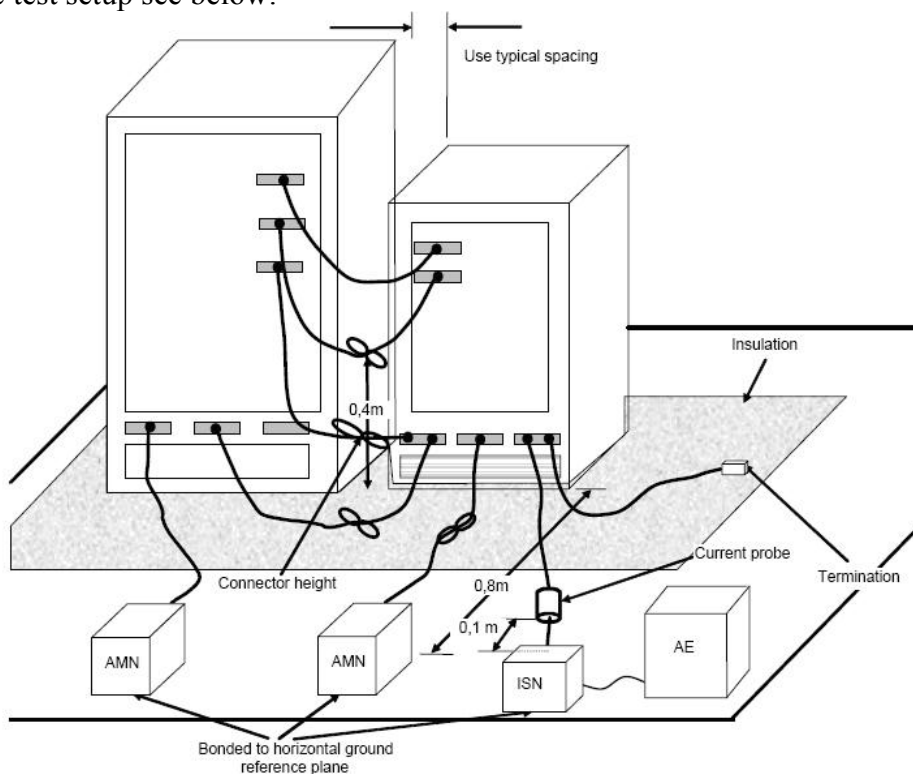
##### 3.1.1 LIMITS

FREQUENCY (MHz)	Quasi-peak (dB $\mu$ V)	Average (dB $\mu$ V)
0.15~0.5	66~56	56~46
0.50~5.0	56	46
5.0~30.0	60	50

**NOTE:** (1) The lower limit shall apply at the transition frequencies.  
 (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 ~0.50 MHz.  
 (3) An allowance of +14 dB is permitted for the output of the UPS.

##### 3.1.2 TEST METHOD

The EUT shall be placed on a non-conductive table such that it is 0.1 m above the horizontal ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The V-network shall be 0.8 m away from the EUT, If the mains lead of the appliance under test is longer than necessary to be connected to the V-network the length of this lead in excess of 0.8 m shall be folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3 m and 0.4 m. The test setup see below:



## TEST REPORT

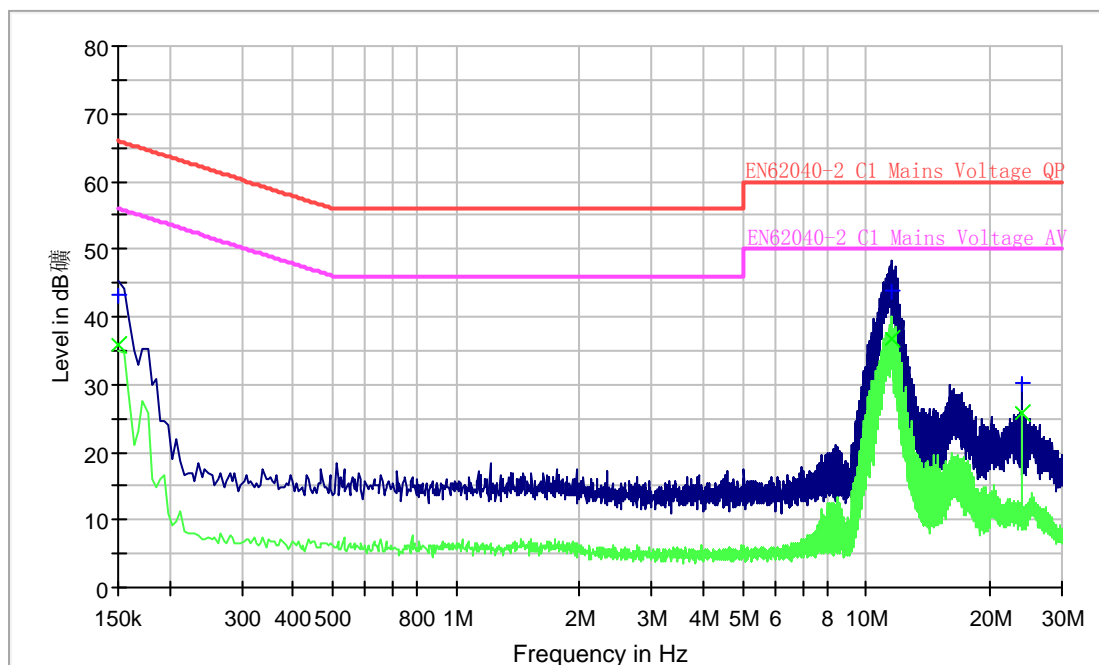
### 3.1.3 TEST CHART AND DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

#### Test Data of AC Input interference voltage

**Port: L1**

Voltage ESH2-Z5 PRE



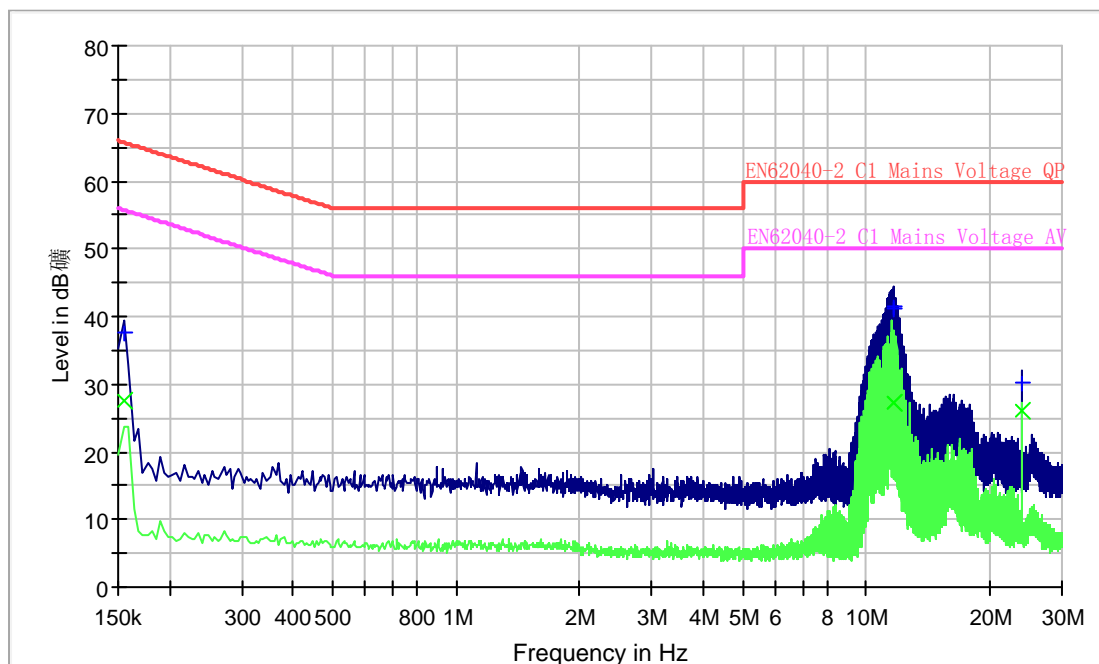
#### Detected Peaks:

Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
1	0.150	43.3	35.8	66.0	56.0	Pass
2	11.580	43.8	36.8	60.0	50.0	Pass
3	24.000	30.4	25.9	60.0	50.0	Pass

## TEST REPORT

**Port: L2**

Voltage ESH2-Z5 PRE



**Detected Peaks:**

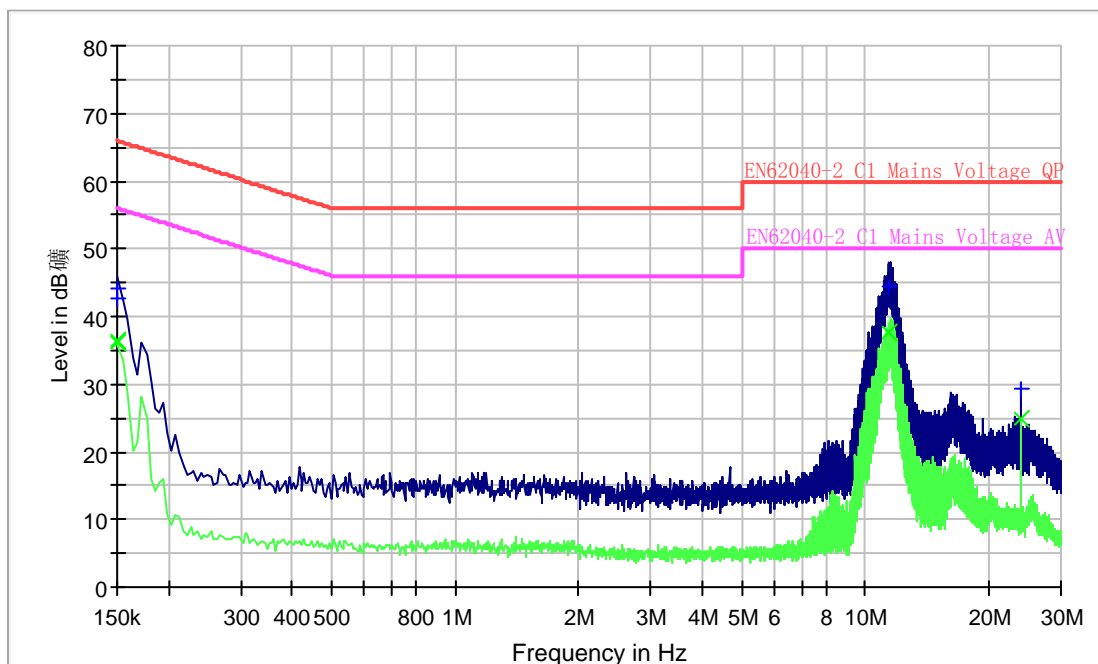
Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
1	0.155	37.6	27.7	65.8	55.8	Pass
2	11.598	41.2	27.3	60.0	50.0	Pass
3	24.000	30.1	26.0	60.0	50.0	Pass



## TEST REPORT

**Port: L3**

Voltage ESH2-Z5 PRE



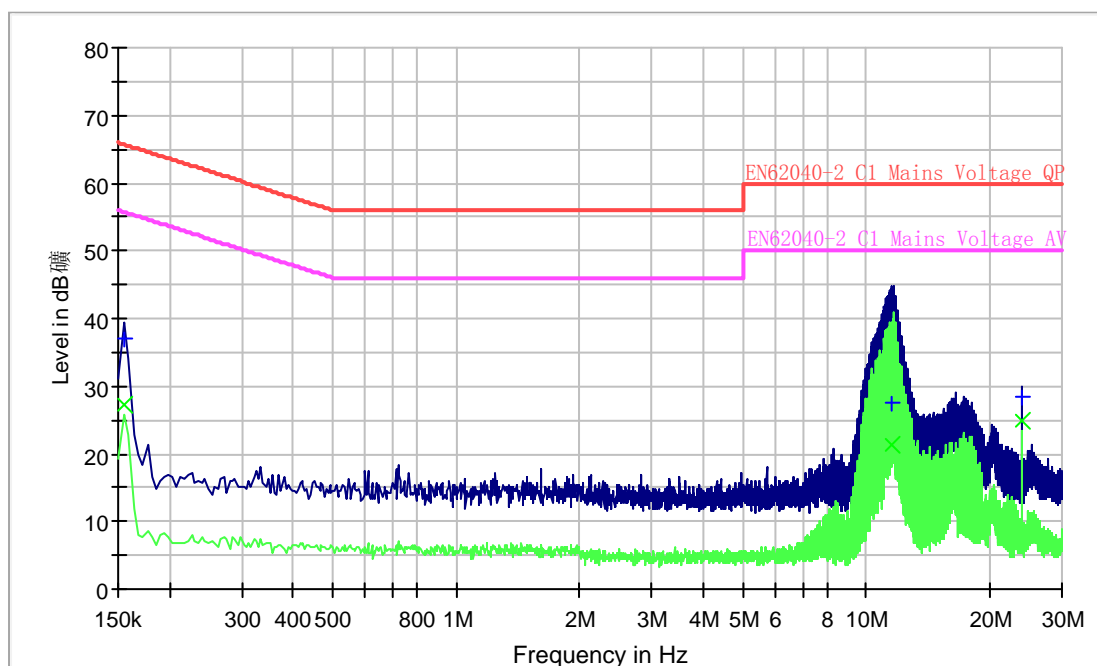
**Detected Peaks:**

Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
1	0.150	44.2	36.4	66.0	56.0	Pass
2	11.463	44.6	37.8	60.0	50.0	Pass
3	24.000	29.4	25.0	60.0	50.0	Pass

## TEST REPORT

**Port: N**

Voltage ESH2-Z5 PRE



**Detected Peaks:**

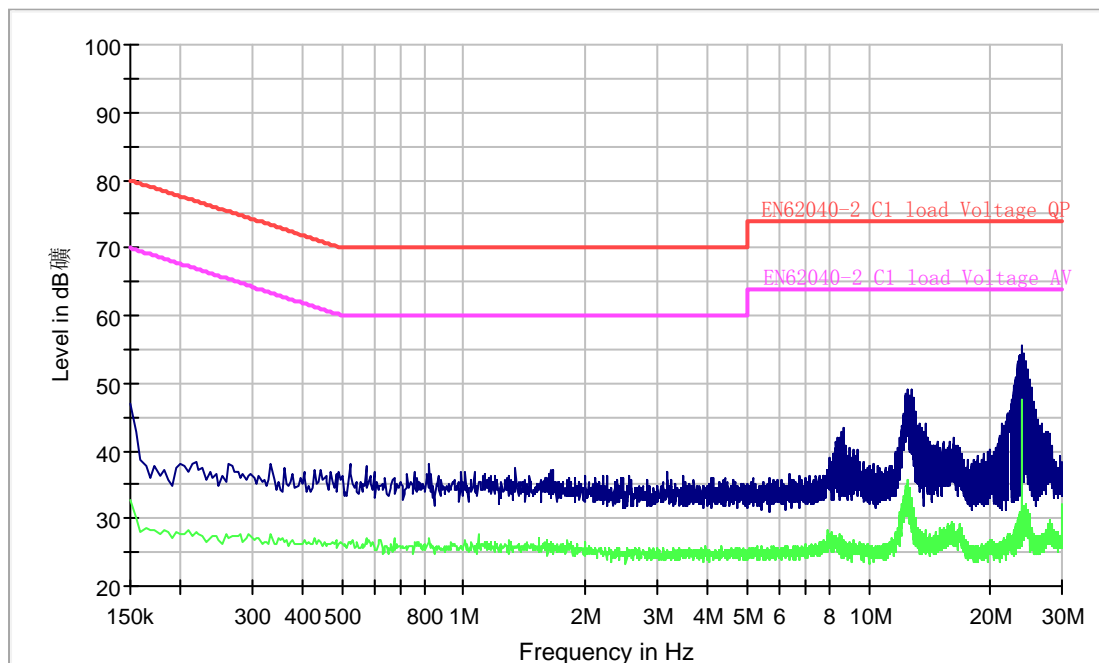
Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
1	0.155	37.2	27.1	65.8	55.8	Pass
2	11.549	27.4	21.4	60.0	50.0	Pass
3	24.000	28.6	24.8	60.0	50.0	Pass

## TEST REPORT

### Test Data of AC Output interference voltage

Port: L

EN62040-2 Load Voltage Pre



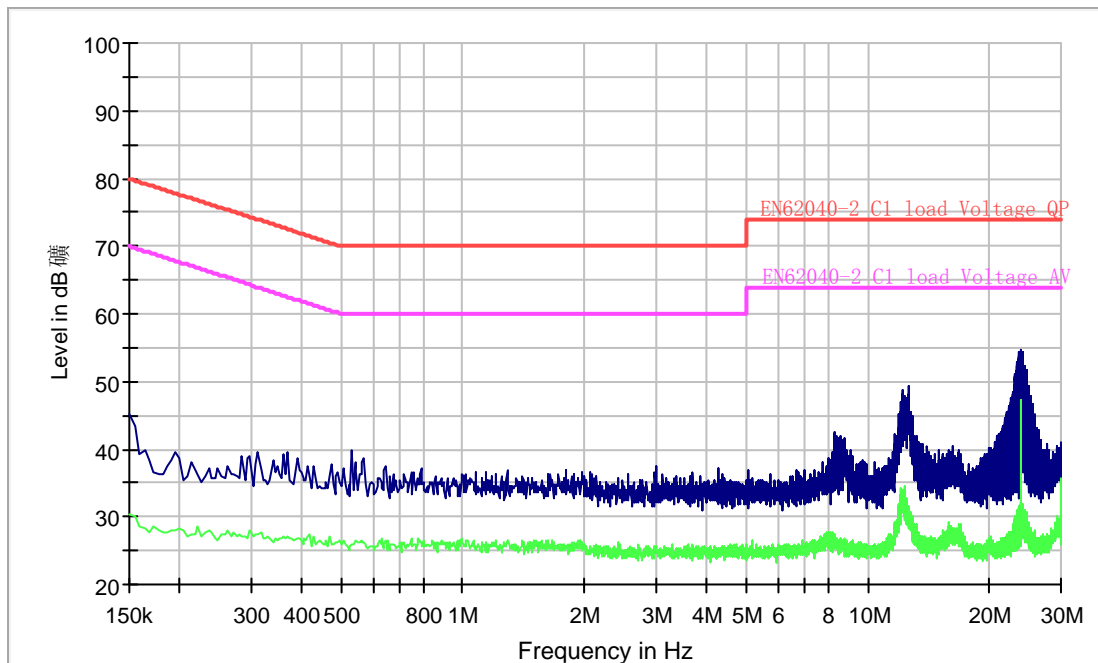
**Detected Peaks:**

Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
No Detected Peaks						

## TEST REPORT

**Port: N**

EN62040-2 Load Voltage Pre



**Detected Peaks:**

Nr	Frequency (MHz)	QP Value (dBuV)	AVG Value (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	Result
No Detected Peaks						

## TEST REPORT

### 3.2 RADIATED EMISSION

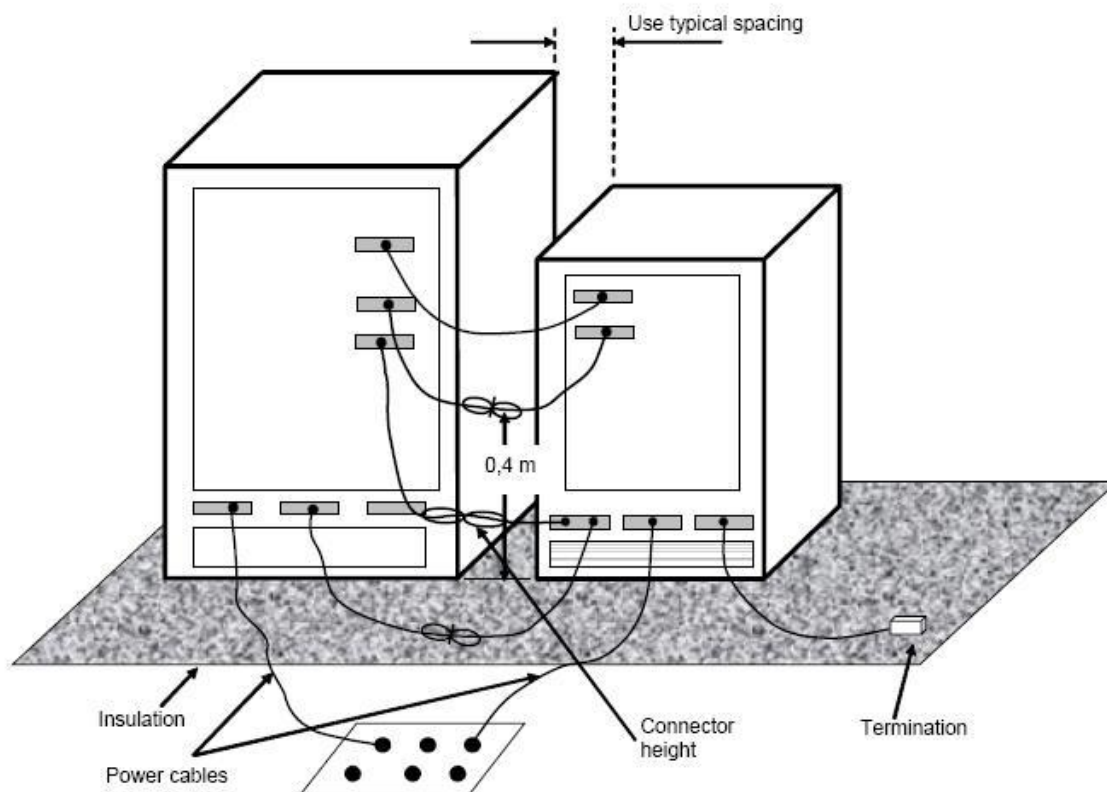
#### 3.2.1 LIMITS

FREQUENCY (MHz)	Quasi-peak(dBμV/m)
30~230	40
230~1000	47

**NOTE:** The lower limit shall apply at the transition frequencies.

#### 3.2.2 TEST METHOD

The EUT shall be placed on a non-conductive table such that it is 0.1m above the horizontal ground reference plane. If the mains input cable of the external power supply unit is greater than 0.8m, the external power supply unit shall be placed on the tabletop, with a nominal 0.1m separation from the host unit. If more than two units are present, the test arrangement shall be chosen that maintains as close as practical the 0.1m spacing between units unless they are normally located closer together. Intra-unit cables shall be draped over the back of the table. If a cable hangs closer than 0.4m from the horizontal ground plane (or floor), the excess shall be folded at the cable centre into a bundle no longer than 0.4m, such that the bundle is at least 0.4 m above the horizontal ground reference plane. The test setup see below:



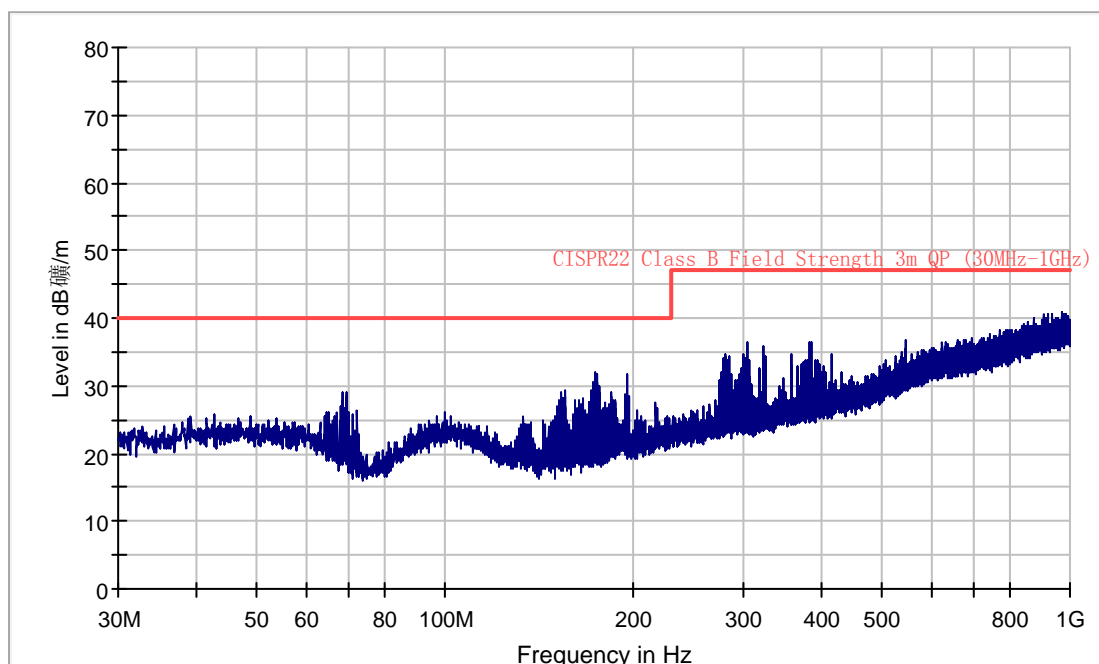
## TEST REPORT

### 3.2.3 TEST CHART AND DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

#### Horizontal Polarization

Rad. EM VULB9163 (30M-1GHz) PRE



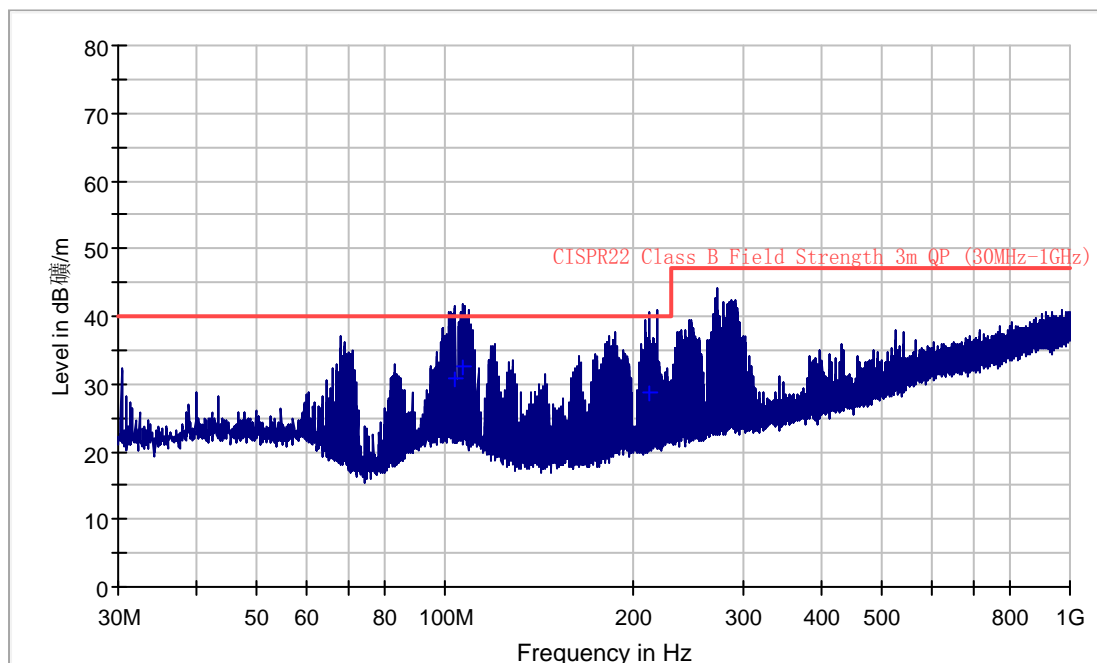
#### Detected Peaks:

Nr	Frequency (MHz)	QP Value (dBuV/m)	QP Limit (dBuV/m)	Result
No Detected Peaks				

## TEST REPORT

### Vertical Polarization

Rad. EM VULB9163 (30M-1GHz) PRE



### Detected Peaks:

Nr	Frequency (MHz)	QP Value (dBuV/m)	QP Limit (dBuV/m)	Result
1	103.380	30.9	40.0	Pass
2	106.740	32.6	40.0	Pass
3	212.880	28.8	40.0	Pass

## TEST REPORT

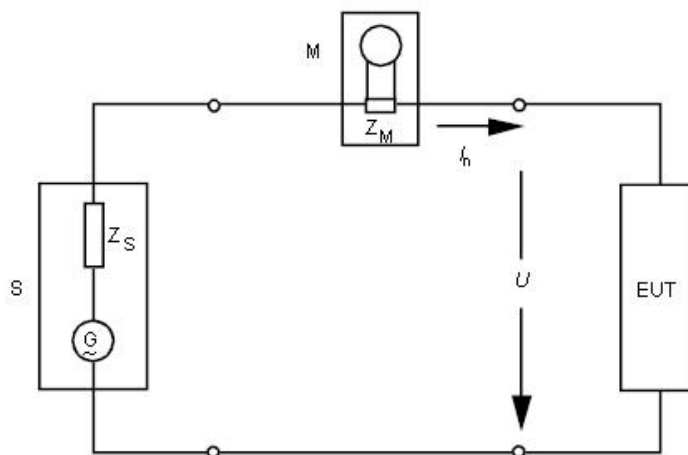
### 3.3 HARMONICS CURRENT

#### 3.3.1 LIMITS

<b>Limits for Class A equipment</b>	
Harmonic order (n)	Maximum permissible harmonic current (A)
<b>Odd harmonics</b>	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 * 15/n$
<b>Even harmonics</b>	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 * 8/n$

#### 3.3.2 TEST METHOD

The EUT setup shall be Simulated conditions of normal use and is tested with the equipment configured to its rated current. In this case, the equipment, if necessary, may be configured with its power supplies loaded with additional load (resistive) boards to simulate rated current conditions. The test circuit see below:



- |   |  |
|---|--|
| <p>S power supply source<br/> M measurement equipment<br/> EUT equipment under test<br/> U test voltage</p> | <p><math>Z_M</math> input impedance of measurement equipment<br/> <math>Z_S</math> internal impedance of the supply source<br/> <math>I_n</math> harmonic component of order n of the line current<br/> G open-loop voltage of the supply source</p> |
|---|--|



## TEST REPORT

### 3.3.3 TEST CHART AND DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

#### Port: L1

<i>Power and THD results - DS: 100</i>			
True power P:	7.605W	Apparent power S:	113.8VA
Reactiv power Q:	113.5var	Power factor:	0.067
THD (U):	0.001	THD (I):	0.122
Crest Factor (U):	1.414	Crest Factor (I):	1.556

## TEST REPORT

<i>Average harmonic current results</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	487.034E-3			
2	1.420E-3	0.146	972.00E-3	PASS
3	17.309E-3	0.836	2.07	PASS
4	5.045E-3	1.304	387.00E-3	PASS
5	14.836E-3	1.446	1.03	PASS
6	1.277E-3	0.473	270.00E-3	PASS
7	9.516E-3	1.373	693.00E-3	PASS
8	2.082E-3	1.006	207.00E-3	PASS
9	41.895E-3	11.637	360.00E-3	PASS
10	1.834E-3	1.108	165.60E-3	PASS
11	9.962E-3	3.354	297.00E-3	PASS
12	1.552E-3	1.124	138.00E-3	PASS
13	14.704E-3	7.780	189.00E-3	PASS
14	2.069E-3	1.749	118.29E-3	PASS
15	5.149E-3	3.814	135.00E-3	PASS
16	1.743E-3	1.684	103.50E-3	PASS
17	15.257E-3	12.809	119.11E-3	PASS
18	1.961E-3	2.132	92.00E-3	PASS
19	3.141E-3	2.947	106.58E-3	PASS
20	1.537E-3	1.856	82.80E-3	PASS
21	3.681E-3	3.817	96.43E-3	PASS
22	2.290E-3	3.042	75.28E-3	PASS
23	5.041E-3	5.725	88.05E-3	PASS
24	1.795E-3	2.602	68.99E-3	PASS
25	9.620E-3	11.877	81.00E-3	PASS
26	2.089E-3	3.279	63.69E-3	PASS
27	4.055E-3	5.408	75.00E-3	PASS
28	1.928E-3	3.261	59.14E-3	PASS
29	5.410E-3	7.747	69.83E-3	PASS
30	2.071E-3	3.752	55.20E-3	PASS
31	12.279E-3	18.798	65.32E-3	PASS
32	2.392E-3	4.623	51.75E-3	PASS
33	4.186E-3	6.822	61.36E-3	PASS
34	1.856E-3	3.811	48.71E-3	PASS
35	4.780E-3	8.262	57.86E-3	PASS
36	2.365E-3	5.142	46.00E-3	PASS
37	2.239E-3	4.090	54.73E-3	PASS
38	1.935E-3	4.441	43.58E-3	PASS
39	2.216E-3	4.268	51.92E-3	PASS
40	2.365E-3	5.714	41.40E-3	PASS



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## TEST REPORT

<i>Maximum harmonic current results</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	488.017E-3			
2	1.953E-3	0.090	2.16	PASS
3	18.370E-3	0.399	4.60	PASS
4	5.237E-3	0.609	860.00E-3	PASS
5	17.943E-3	0.787	2.28	PASS
6	1.490E-3	0.248	600.00E-3	PASS
7	16.251E-3	1.055	1.54	PASS
8	2.617E-3	0.569	460.00E-3	PASS
9	44.417E-3	5.552	800.00E-3	PASS
10	2.086E-3	0.567	368.00E-3	PASS
11	20.254E-3	3.069	660.00E-3	PASS
12	1.798E-3	0.586	306.66E-3	PASS
13	24.489E-3	5.831	420.00E-3	PASS
14	2.585E-3	0.983	262.86E-3	PASS
15	11.541E-3	3.847	300.00E-3	PASS
16	2.155E-3	0.937	230.00E-3	PASS
17	16.994E-3	6.420	264.70E-3	PASS
18	2.259E-3	1.105	204.44E-3	PASS
19	11.438E-3	4.829	236.84E-3	PASS
20	1.844E-3	1.002	184.00E-3	PASS
21	11.900E-3	5.554	214.28E-3	PASS
22	2.550E-3	1.525	167.28E-3	PASS
23	9.227E-3	4.716	195.66E-3	PASS
24	2.101E-3	1.370	153.32E-3	PASS
25	11.118E-3	6.177	180.00E-3	PASS
26	2.513E-3	1.775	141.54E-3	PASS
27	9.424E-3	5.655	166.66E-3	PASS
28	2.188E-3	1.665	131.42E-3	PASS
29	7.850E-3	5.059	155.18E-3	PASS
30	2.856E-3	2.328	122.66E-3	PASS
31	20.652E-3	14.227	145.16E-3	PASS
32	3.064E-3	2.665	115.00E-3	PASS
33	9.368E-3	6.870	136.36E-3	PASS
34	2.135E-3	1.972	108.24E-3	PASS
35	9.094E-3	7.072	128.58E-3	PASS
36	2.915E-3	2.851	102.22E-3	PASS
37	5.778E-3	4.751	121.62E-3	PASS
38	2.227E-3	2.300	96.84E-3	PASS
39	2.861E-3	2.480	115.38E-3	PASS
40	2.827E-3	3.073	92.00E-3	PASS

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<i>Harmonic current results - DS: 100</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	486.623E-3			
2	1.390E-3	0.129	1.08	PASS
3	16.612E-3	0.722	2.30	PASS
4	4.866E-3	1.132	430.00E-3	PASS
5	16.271E-3	1.427	1.14	PASS
6	1.229E-3	0.410	300.00E-3	PASS
7	10.623E-3	1.380	770.00E-3	PASS
8	2.068E-3	0.899	230.00E-3	PASS
9	41.377E-3	10.344	400.00E-3	PASS
10	1.727E-3	0.939	184.00E-3	PASS
11	11.150E-3	3.379	330.00E-3	PASS
12	1.499E-3	0.978	153.33E-3	PASS
13	13.744E-3	6.545	210.00E-3	PASS
14	1.934E-3	1.471	131.43E-3	PASS
15	5.872E-3	3.915	150.00E-3	PASS
16	1.776E-3	1.545	115.00E-3	PASS
17	15.244E-3	11.518	132.35E-3	PASS
18	1.946E-3	1.904	102.22E-3	PASS
19	2.485E-3	2.099	118.42E-3	PASS
20	1.409E-3	1.531	92.00E-3	PASS
21	3.681E-3	3.435	107.14E-3	PASS
22	2.304E-3	2.754	83.64E-3	PASS
23	4.800E-3	4.907	97.83E-3	PASS
24	1.798E-3	2.345	76.66E-3	PASS
25	10.248E-3	11.387	90.00E-3	PASS
26	2.077E-3	2.935	70.77E-3	PASS
27	4.485E-3	5.382	83.33E-3	PASS
28	2.006E-3	3.052	65.71E-3	PASS
29	4.256E-3	5.486	77.59E-3	PASS
30	2.009E-3	3.275	61.33E-3	PASS
31	11.592E-3	15.971	72.58E-3	PASS
32	2.326E-3	4.045	57.50E-3	PASS
33	2.925E-3	4.290	68.18E-3	PASS
34	1.803E-3	3.331	54.12E-3	PASS
35	4.498E-3	6.996	64.29E-3	PASS
36	2.467E-3	4.826	51.11E-3	PASS
37	1.914E-3	3.147	60.81E-3	PASS
38	2.020E-3	4.172	48.42E-3	PASS
39	1.927E-3	3.340	57.69E-3	PASS
40	2.146E-3	4.665	46.00E-3	PASS



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## TEST REPORT

Port: L2

<i>Power and THD results - DS: 100</i>			
True power P:	-69.79W	Apparent power S:	106.6VA
Reactiv power Q:	80.57var	Power factor:	-0.655
THD (U):	0.001	THD (I):	0.135
Crest Factor (U):	1.414	Crest Factor (I):	1.532

## TEST REPORT

<i>Average harmonic current results</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	455.345E-3			
2	1.822E-3	0.187	972.00E-3	PASS
3	18.524E-3	0.895	2.07	PASS
4	5.015E-3	1.296	387.00E-3	PASS
5	10.990E-3	1.071	1.03	PASS
6	1.393E-3	0.516	270.00E-3	PASS
7	9.219E-3	1.330	693.00E-3	PASS
8	2.224E-3	1.074	207.00E-3	PASS
9	46.323E-3	12.867	360.00E-3	PASS
10	1.903E-3	1.149	165.60E-3	PASS
11	12.418E-3	4.181	297.00E-3	PASS
12	1.653E-3	1.198	138.00E-3	PASS
13	14.183E-3	7.504	189.00E-3	PASS
14	1.894E-3	1.601	118.29E-3	PASS
15	7.474E-3	5.536	135.00E-3	PASS
16	1.839E-3	1.777	103.50E-3	PASS
17	9.978E-3	8.377	119.11E-3	PASS
18	1.836E-3	1.995	92.00E-3	PASS
19	4.553E-3	4.272	106.58E-3	PASS
20	1.942E-3	2.345	82.80E-3	PASS
21	14.745E-3	15.292	96.43E-3	PASS
22	2.568E-3	3.412	75.28E-3	PASS
23	7.272E-3	8.260	88.05E-3	PASS
24	1.805E-3	2.616	68.99E-3	PASS
25	2.601E-3	3.211	81.00E-3	PASS
26	2.034E-3	3.194	63.69E-3	PASS
27	5.782E-3	7.709	75.00E-3	PASS
28	2.017E-3	3.411	59.14E-3	PASS
29	3.634E-3	5.204	69.83E-3	PASS
30	1.726E-3	3.127	55.20E-3	PASS
31	5.853E-3	8.960	65.32E-3	PASS
32	1.912E-3	3.694	51.75E-3	PASS
33	4.324E-3	7.046	61.36E-3	PASS
34	1.866E-3	3.832	48.71E-3	PASS
35	8.380E-3	14.483	57.86E-3	PASS
36	2.119E-3	4.606	46.00E-3	PASS
37	7.098E-3	12.969	54.73E-3	PASS
38	2.017E-3	4.629	43.58E-3	PASS
39	4.120E-3	7.936	51.92E-3	PASS
40	1.847E-3	4.462	41.40E-3	PASS



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## TEST REPORT

<i>Maximum harmonic current results</i>				
Hn	$I_{eff}$ [A]	% of Limit	Limit [A]	Result
1	457.032E-3			
2	2.479E-3	0.115	2.16	PASS
3	20.204E-3	0.439	4.60	PASS
4	5.153E-3	0.599	860.00E-3	PASS
5	11.753E-3	0.515	2.28	PASS
6	1.636E-3	0.273	600.00E-3	PASS
7	10.828E-3	0.703	1.54	PASS
8	2.600E-3	0.565	460.00E-3	PASS
9	47.566E-3	5.946	800.00E-3	PASS
10	2.413E-3	0.656	368.00E-3	PASS
11	14.268E-3	2.162	660.00E-3	PASS
12	2.055E-3	0.670	306.66E-3	PASS
13	15.992E-3	3.808	420.00E-3	PASS
14	2.355E-3	0.896	262.86E-3	PASS
15	9.052E-3	3.017	300.00E-3	PASS
16	2.019E-3	0.878	230.00E-3	PASS
17	11.259E-3	4.253	264.70E-3	PASS
18	2.200E-3	1.076	204.44E-3	PASS
19	7.198E-3	3.039	236.84E-3	PASS
20	2.254E-3	1.225	184.00E-3	PASS
21	15.887E-3	7.414	214.28E-3	PASS
22	2.940E-3	1.758	167.28E-3	PASS
23	8.652E-3	4.422	195.66E-3	PASS
24	2.064E-3	1.346	153.32E-3	PASS
25	4.257E-3	2.365	180.00E-3	PASS
26	2.202E-3	1.556	141.54E-3	PASS
27	6.304E-3	3.783	166.66E-3	PASS
28	2.292E-3	1.744	131.42E-3	PASS
29	4.883E-3	3.147	155.18E-3	PASS
30	1.966E-3	1.603	122.66E-3	PASS
31	7.147E-3	4.923	145.16E-3	PASS
32	2.195E-3	1.909	115.00E-3	PASS
33	5.816E-3	4.265	136.36E-3	PASS
34	2.168E-3	2.003	108.24E-3	PASS
35	9.722E-3	7.561	128.58E-3	PASS
36	2.489E-3	2.435	102.22E-3	PASS
37	8.356E-3	6.870	121.62E-3	PASS
38	2.381E-3	2.459	96.84E-3	PASS
39	4.841E-3	4.196	115.38E-3	PASS
40	2.119E-3	2.303	92.00E-3	PASS



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## TEST REPORT

<i>Harmonic current results - DS: 100</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	455.021E-3			
2	1.577E-3	0.146	1.08	PASS
3	17.715E-3	0.770	2.30	PASS
4	5.074E-3	1.180	430.00E-3	PASS
5	10.591E-3	0.929	1.14	PASS
6	1.413E-3	0.471	300.00E-3	PASS
7	8.239E-3	1.070	770.00E-3	PASS
8	2.027E-3	0.881	230.00E-3	PASS
9	47.113E-3	11.778	400.00E-3	PASS
10	1.735E-3	0.943	184.00E-3	PASS
11	12.670E-3	3.839	330.00E-3	PASS
12	1.616E-3	1.054	153.33E-3	PASS
13	14.012E-3	6.673	210.00E-3	PASS
14	1.961E-3	1.492	131.43E-3	PASS
15	7.193E-3	4.795	150.00E-3	PASS
16	1.864E-3	1.621	115.00E-3	PASS
17	10.685E-3	8.073	132.35E-3	PASS
18	1.863E-3	1.822	102.22E-3	PASS
19	3.758E-3	3.173	118.42E-3	PASS
20	1.733E-3	1.884	92.00E-3	PASS
21	15.366E-3	14.342	107.14E-3	PASS
22	2.579E-3	3.084	83.64E-3	PASS
23	7.446E-3	7.611	97.83E-3	PASS
24	1.766E-3	2.304	76.66E-3	PASS
25	2.709E-3	3.010	90.00E-3	PASS
26	2.059E-3	2.909	70.77E-3	PASS
27	6.078E-3	7.294	83.33E-3	PASS
28	1.974E-3	3.005	65.71E-3	PASS
29	3.620E-3	4.665	77.59E-3	PASS
30	1.791E-3	2.921	61.33E-3	PASS
31	6.613E-3	9.112	72.58E-3	PASS
32	1.979E-3	3.442	57.50E-3	PASS
33	5.385E-3	7.898	68.18E-3	PASS
34	1.747E-3	3.228	54.12E-3	PASS
35	8.578E-3	13.343	64.29E-3	PASS
36	2.172E-3	4.250	51.11E-3	PASS
37	6.974E-3	11.468	60.81E-3	PASS
38	1.916E-3	3.957	48.42E-3	PASS
39	3.638E-3	6.305	57.69E-3	PASS
40	1.757E-3	3.819	46.00E-3	PASS



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## TEST REPORT

Port: L3

<i>Power and THD results - DS: 100</i>			
True power P:	430.5W	Apparent power S:	1.316kVA
Reactiv power Q:	1.244kvar	Power factor:	0.327
THD (U):	0.001	THD (I):	0.162
Crest Factor (U):	1.414	Crest Factor (I):	1.597

## TEST REPORT

<i>Average harmonic current results</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	5.598			
2	20.459E-3	2.105	972.00E-3	PASS
3	885.669E-3	42.786	2.07	PASS
4	11.408E-3	2.948	387.00E-3	PASS
5	59.587E-3	5.808	1.03	PASS
6	5.040E-3	1.867	270.00E-3	PASS
7	34.525E-3	4.982	693.00E-3	PASS
8	4.987E-3	2.409	207.00E-3	PASS
9	52.533E-3	14.592	360.00E-3	PASS
10	4.737E-3	2.860	165.60E-3	PASS
11	68.362E-3	23.017	297.00E-3	PASS
12	4.700E-3	3.406	138.00E-3	PASS
13	29.081E-3	15.387	189.00E-3	PASS
14	4.587E-3	3.878	118.29E-3	PASS
15	44.859E-3	33.229	135.00E-3	PASS
16	4.381E-3	4.233	103.50E-3	PASS
17	34.557E-3	29.012	119.11E-3	PASS
18	5.385E-3	5.853	92.00E-3	PASS
19	22.225E-3	20.853	106.58E-3	PASS
20	4.967E-3	5.999	82.80E-3	PASS
21	13.451E-3	13.949	96.43E-3	PASS
22	23.133E-3	30.730	75.28E-3	PASS
23	24.567E-3	27.902	88.05E-3	PASS
24	19.772E-3	28.658	68.99E-3	PASS
25	18.452E-3	22.780	81.00E-3	PASS
26	5.824E-3	9.144	63.69E-3	PASS
27	13.596E-3	18.129	75.00E-3	PASS
28	4.830E-3	8.168	59.14E-3	PASS
29	17.757E-3	25.428	69.83E-3	PASS
30	4.204E-3	7.617	55.20E-3	PASS
31	16.348E-3	25.026	65.32E-3	PASS
32	3.471E-3	6.708	51.75E-3	PASS
33	12.893E-3	21.011	61.36E-3	PASS
34	4.160E-3	8.540	48.71E-3	PASS
35	7.644E-3	13.212	57.86E-3	PASS
36	4.678E-3	10.170	46.00E-3	PASS
37	10.200E-3	18.637	54.73E-3	PASS
38	3.019E-3	6.928	43.58E-3	PASS
39	9.819E-3	18.912	51.92E-3	PASS
40	3.636E-3	8.783	41.40E-3	PASS



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## TEST REPORT

<i>Maximum harmonic current results</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	5.608			
2	35.179E-3	1.629	2.16	PASS
3	896.167E-3	19.482	4.60	PASS
4	18.790E-3	2.185	860.00E-3	PASS
5	68.276E-3	2.995	2.28	PASS
6	9.112E-3	1.519	600.00E-3	PASS
7	46.849E-3	3.042	1.54	PASS
8	7.004E-3	1.523	460.00E-3	PASS
9	62.237E-3	7.780	800.00E-3	PASS
10	7.412E-3	2.014	368.00E-3	PASS
11	91.073E-3	13.799	660.00E-3	PASS
12	6.550E-3	2.136	306.66E-3	PASS
13	36.679E-3	8.733	420.00E-3	PASS
14	6.433E-3	2.447	262.86E-3	PASS
15	53.780E-3	17.927	300.00E-3	PASS
16	6.062E-3	2.636	230.00E-3	PASS
17	53.138E-3	20.075	264.70E-3	PASS
18	6.764E-3	3.309	204.44E-3	PASS
19	29.823E-3	12.592	236.84E-3	PASS
20	5.716E-3	3.106	184.00E-3	PASS
21	22.025E-3	10.279	214.28E-3	PASS
22	24.883E-3	14.875	167.28E-3	PASS
23	31.142E-3	15.917	195.66E-3	PASS
24	22.193E-3	14.475	153.32E-3	PASS
25	25.787E-3	14.326	180.00E-3	PASS
26	7.080E-3	5.002	141.54E-3	PASS
27	20.702E-3	12.421	166.66E-3	PASS
28	5.791E-3	4.407	131.42E-3	PASS
29	27.446E-3	17.687	155.18E-3	PASS
30	5.376E-3	4.383	122.66E-3	PASS
31	37.364E-3	25.740	145.16E-3	PASS
32	6.009E-3	5.225	115.00E-3	PASS
33	24.549E-3	18.003	136.36E-3	PASS
34	5.479E-3	5.062	108.24E-3	PASS
35	21.914E-3	17.043	128.58E-3	PASS
36	6.155E-3	6.021	102.22E-3	PASS
37	32.378E-3	26.622	121.62E-3	PASS
38	4.568E-3	4.717	96.84E-3	PASS
39	19.626E-3	17.010	115.38E-3	PASS
40	5.557E-3	6.040	92.00E-3	PASS



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## TEST REPORT

<i>Harmonic current results - DS: 100</i>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	5.597			
2	23.066E-3	2.136	1.08	PASS
3	891.605E-3	38.765	2.30	PASS
4	8.120E-3	1.888	430.00E-3	PASS
5	58.072E-3	5.094	1.14	PASS
6	3.964E-3	1.321	300.00E-3	PASS
7	46.315E-3	6.015	770.00E-3	PASS
8	4.116E-3	1.790	230.00E-3	PASS
9	34.135E-3	8.534	400.00E-3	PASS
10	4.204E-3	2.285	184.00E-3	PASS
11	85.240E-3	25.830	330.00E-3	PASS
12	4.346E-3	2.835	153.33E-3	PASS
13	15.266E-3	7.269	210.00E-3	PASS
14	3.784E-3	2.879	131.43E-3	PASS
15	31.192E-3	20.795	150.00E-3	PASS
16	4.147E-3	3.606	115.00E-3	PASS
17	51.889E-3	39.206	132.35E-3	PASS
18	6.450E-3	6.310	102.22E-3	PASS
19	29.727E-3	25.103	118.42E-3	PASS
20	5.245E-3	5.702	92.00E-3	PASS
21	22.025E-3	20.558	107.14E-3	PASS
22	22.880E-3	27.356	83.64E-3	PASS
23	22.499E-3	22.998	97.83E-3	PASS
24	19.151E-3	24.981	76.66E-3	PASS
25	25.787E-3	28.652	90.00E-3	PASS
26	6.010E-3	8.492	70.77E-3	PASS
27	20.702E-3	24.843	83.33E-3	PASS
28	5.108E-3	7.774	65.71E-3	PASS
29	23.114E-3	29.790	77.59E-3	PASS
30	5.188E-3	8.460	61.33E-3	PASS
31	35.429E-3	48.813	72.58E-3	PASS
32	4.042E-3	7.030	57.50E-3	PASS
33	23.998E-3	35.198	68.18E-3	PASS
34	5.139E-3	9.496	54.12E-3	PASS
35	21.673E-3	33.712	64.29E-3	PASS
36	5.984E-3	11.709	51.11E-3	PASS
37	30.615E-3	50.346	60.81E-3	PASS
38	3.708E-3	7.657	48.42E-3	PASS
39	19.626E-3	34.020	57.69E-3	PASS
40	4.176E-3	9.078	46.00E-3	PASS



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## **TEST REPORT**

### **3.4 ELECTROSTATIC DISCHARGE IMMUNITY**

#### **3.4.1 TEST METHOD**

The configuration consisted of a wooden table 0.1m high standing on the Ground Reference Plane. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k $\Omega$  total impedance. The EUT was located 0.1m minimum from all side of the **Horizontal Coupling Plane (HCP)** and **Vertical Coupling Plane (VCP)**, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1m minimum was provided between the EUT and the walls of the laboratory and any other metallic structure. The discharges shall be applied in two ways:

a) Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 20 discharges at each test points, 10 each at negative and positive polarity. One of the test points shall be subjected to the center of the front edge of the **HCP** and **VCP**. Test shall be performed at a maximum repetition rate of one discharge per second.

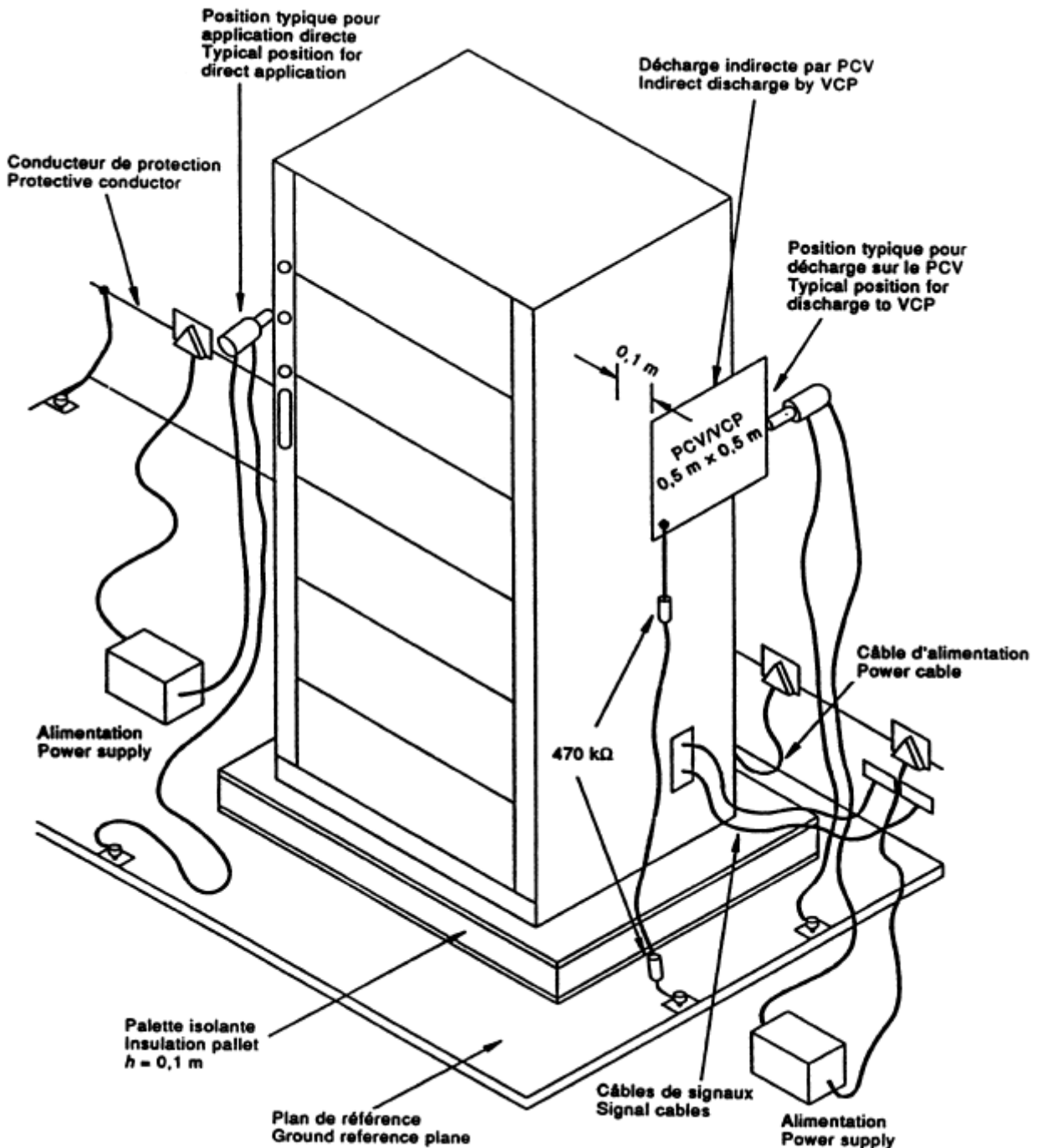
b) Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled by the user. A minimum of 20 single air discharges(10 at negative polarity and 10 at positive polarity.) shall be applied to the selected test point for each such area.

The test setup see below:



## TEST REPORT



## TEST REPORT

### 3.4.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Test point	Test level (kV)	Air (A) Contact (C)	Required Criterion	Performance Criterion	Result
Non-conductive Enclosure	±8	A	B	A	Pass
Key	±8	A	B	A	Pass
LED	±8	A	B	A	Pass
Conductive Enclosure	±4	C	B	A	Pass
VCP	±4	C	B	A	Pass

**Note:** 1.For indirect discharge: VCP=Vertical Coupling Plane  
 2.There was no change compared with initial operation during and after the test.

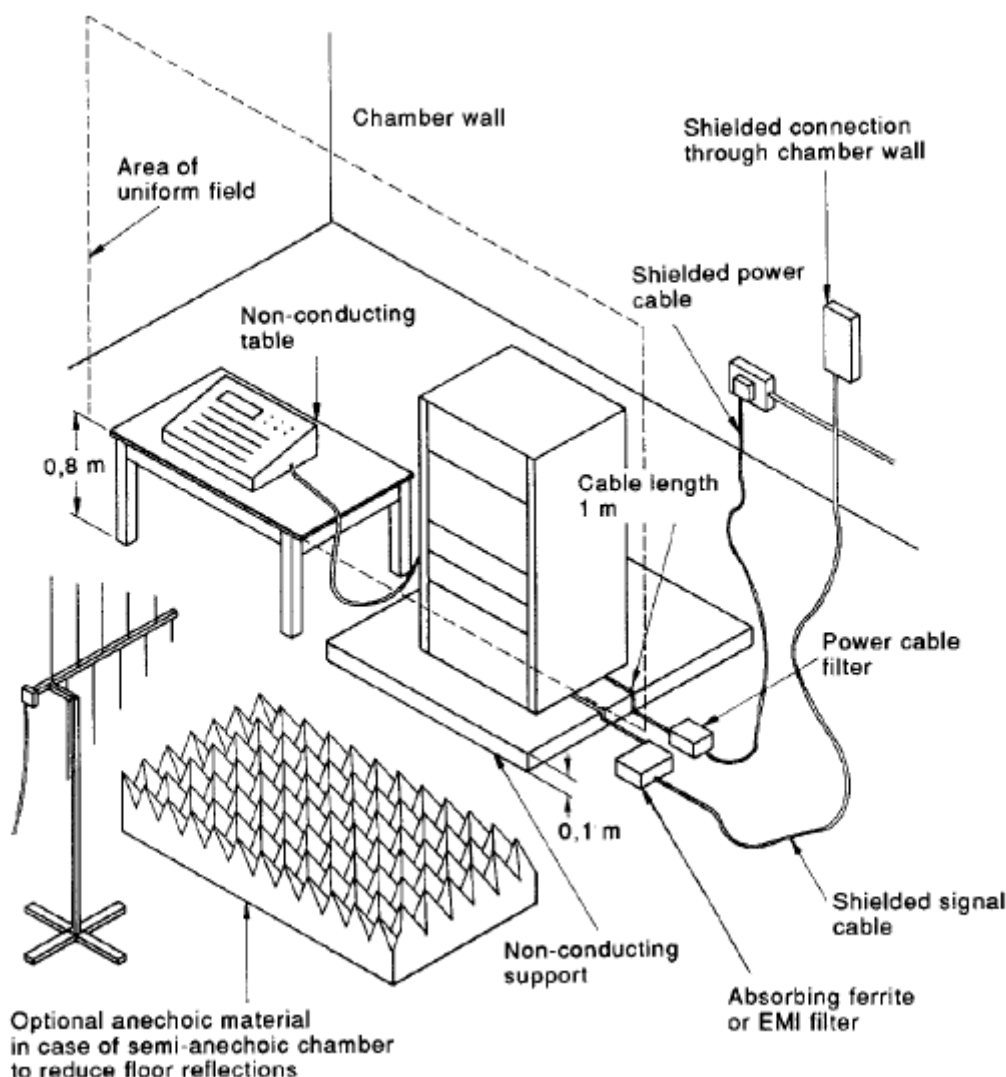
## TEST REPORT

### 3.5 RADIATED IMMUNITY

#### 3.5.1 TEST METHOD

The EUT shall be placed on a non-conductive table such that it is 0.1m high, and should be performed in a configuration as close as possible to the installed case. The wiring was left exposed to the electromagnetic field for a distance of 1m from the EUT.

The test setup see below:





## TEST REPORT

### 3.5.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Frequency Range	Test Level	Sides of EUT	Required Criterion	Performance Criterion	Result
80MHz~1GHz	3V/m	Front	A	A	Pass
		Rear	A	A	Pass
		Left	A	A	Pass
		Right	A	A	Pass

**Note:** There was no change compared with initial operation during and after the test.

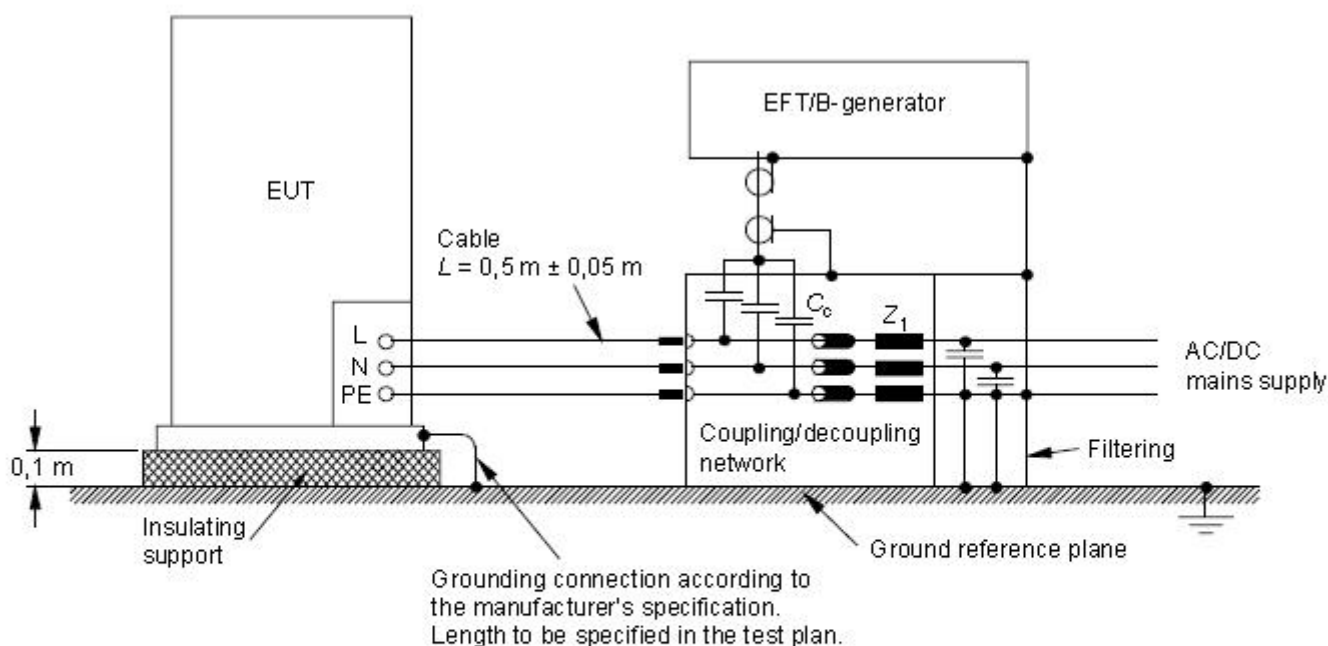
## TEST REPORT

### 3.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY

#### 3.6.1 TEST METHOD

The EUT, whether stationary floor-mounted or table top, and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support  $0.1 \text{ m} \pm 0.01 \text{ m}$  thick. All cables to the EUT shall be placed on the insulation support  $0.1 \text{ m}$  above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables. The minimum distance between the EUT and all other conductive structures (e.g. the walls of a shielded room), except the ground reference plane shall be more than  $0.5 \text{ m}$ . The ground reference plane shall project beyond the EUT by at least  $0.1 \text{ m}$  on all sides.

The test setup see below:



#### Components

PE	protective earth
N	neutral
L	phase
$Z_1$	decoupling inductive
$C_c$	coupling capacitor

## TEST REPORT

### 3.6.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Test Point	Test Level (kV)	Required Criterion	Performance Criterion	Result
L1	±1	B	A	Pass
L2	±1	B	A	Pass
L3	±1	B	A	Pass
N	±1	B	A	Pass
PE	±1	B	A	Pass
L1-L2-L3-N-PE	±1	B	A	Pass

**Note:** There was no change compared with initial operation during and after the test.

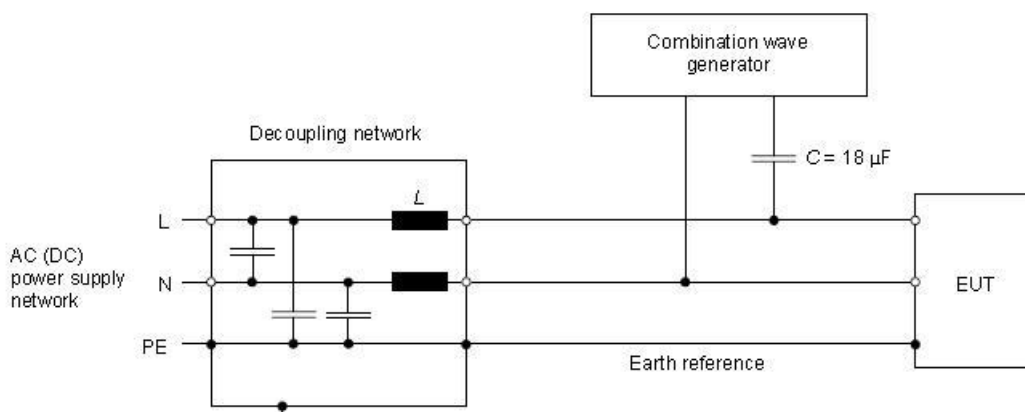
## TEST REPORT

### 3.7 SURGE IMMUNITY

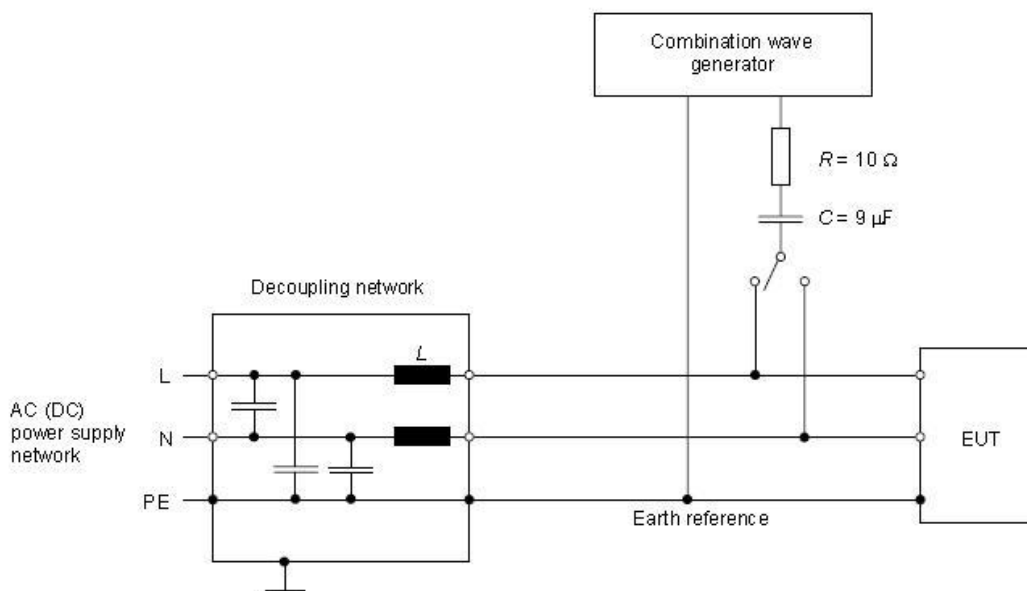
#### 3.7.1 TEST METHOD

The surge is applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

The test setup see below:



**Example of test setup for capacitive coupling on a.c./d.c. lines;  
line-to-line coupling**



**Example of test setup for capacitive coupling on a.c./d.c. lines;  
line-to-ground coupling**

## TEST REPORT

### 3.7.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23℃	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Test Point	Test Level (kV)	Required Criterion	Performance Criterion	Result
L1-L2	±1	B	A	Pass
L1-L3	±1	B	A	Pass
L1-N	±1	B	A	Pass
L2-L3	±1	B	A	Pass
L2-N	±1	B	A	Pass
L3-N	±1	B	A	Pass
L1-PE	±2	B	A	Pass
L2-PE	±2	B	A	Pass
L3-PE	±2	B	A	Pass
N-PE	±2	B	A	Pass

**Note:** There was no change compared with initial operation during and after the test.

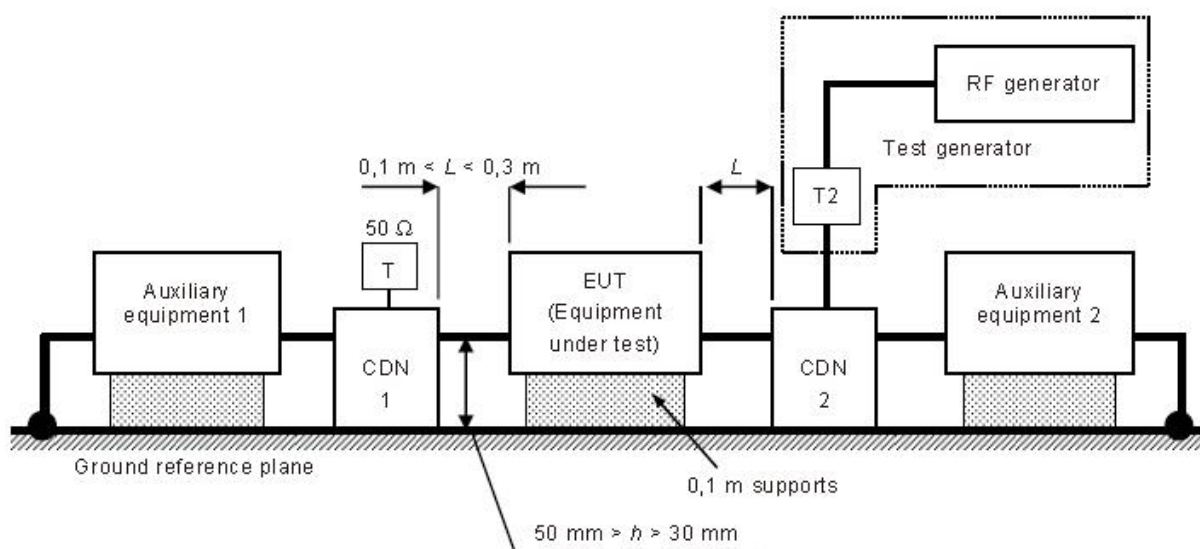
## TEST REPORT

### 3.8 RF CONDUCTED IMMUNITY

#### 3.8.1 TEST METHOD

The EUT is placed on an insulating support of 0.1 m height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 m and 0.3 m from the projected geometry of the EUT on the ground reference plane. Testing with the signal levels established during the setting process, and with the disturbance signal 80 % amplitude modulated with a 1 kHz sine wave. The step size shall be 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s. The sensitive frequencies shall be analyzed separately.

The test setup see below:



#### 3.8.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23°C	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Cable	Frequency Band (MHz)	Field Strength (Vrms)	Required Criterion	Performance Criterion	Result
AC mains	0.15 ~ 80	3	A	A	Pass

**Note:** There was no change compared with initial operation during and after the test.

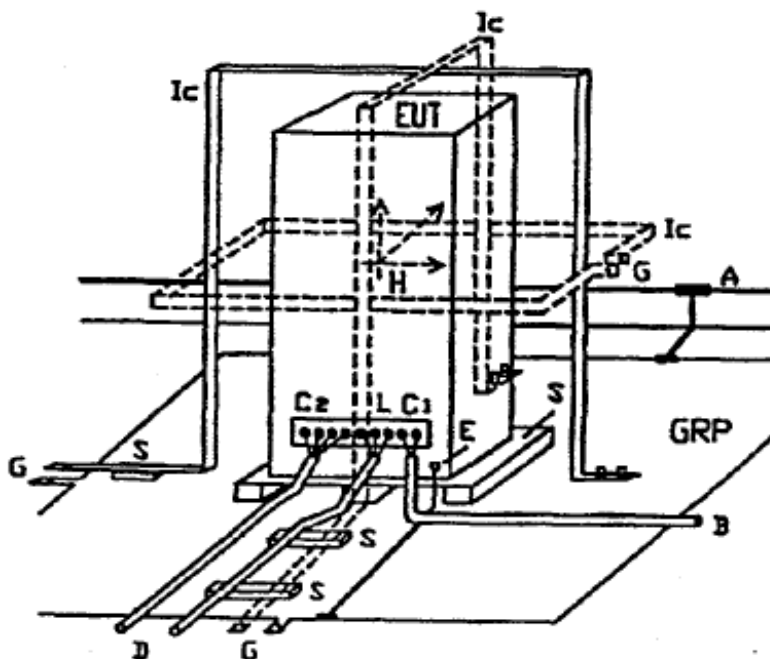
## TEST REPORT

### 3.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY

#### 3.9.1 TEST METHOD

The EUT is placed on the ground reference plane with the interposition of a 0.1m thickness insulating support. The EUT cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT. The cables supplied or recommended by the equipment manufacturer shall be used. In absence of any recommendation, unshielded cables shall be adopted, of a type appropriate for the signals involved, all cables shall be exposed to the magnetic field for 1m of their length.

The test setup see below:



#### 3.9.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23°C	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Test port	Frequency	Magnetic field strength	Required Criterion	Performance Criterion	Result
Enclosure	50Hz	10A/m	A	A	Pass

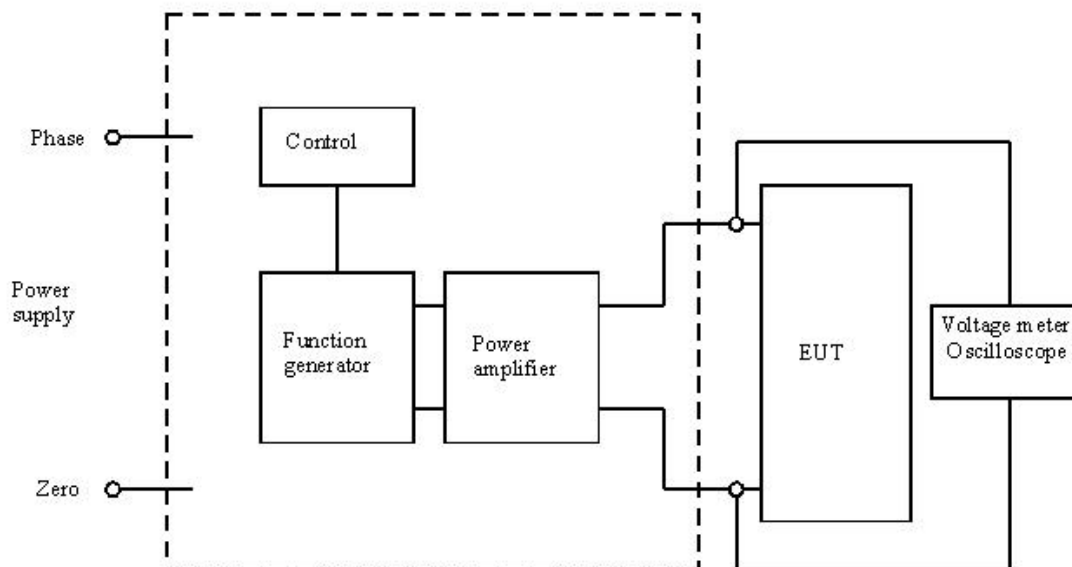
**Note:** There was no change compared with initial operation during and after the test.

## TEST REPORT

### 3.10 VOLTAGE DIPS AND INTERRUPTION IMMUNITY

#### 3.10.1 TEST METHOD

The test shall be performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. If no cable length is specified, it shall be the shortest possible length suitable to the application of the EUT. The test setup see below:



#### 3.10.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23°C	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Reduction of supply voltage of	Voltage in %	Duration in parts of period (in ms)	Required Criterion	Performance Criterion	Result
>95%	0%	0.5 (10 ms)	B	B	Pass
30 %	70%	25 (500 ms)	C	C	Pass
Interruption(>95%)	0%	250(5000 ms)	C	C	Pass

**Note:** There was no change compared with initial operation during and after the test.

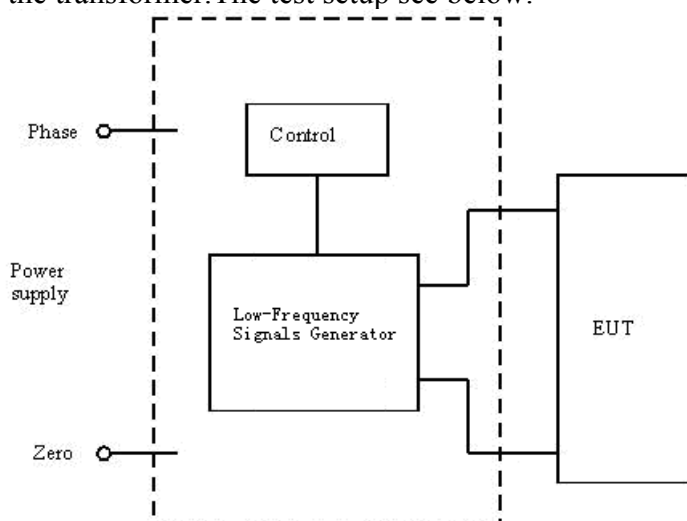


## TEST REPORT

### 3.11 LOW-FREQUENCY SIGNALS

#### 3.11.1 TEST METHOD

The test shall be performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. The test as a minimum shall be performed with a single sinusoidal disturbing voltage of 10 V, at a frequency which is slowly varied from 140 Hz to 360 Hz. Use can be made of a series injection circuit where the mains supplies 50/60Hz power and the amplifier delivers only the harmonics. Power line unbalance (three-phase UPS systems only), The amplitude unbalance test is made with a 230:5 transformer typically connected for a 230V application is as in Figure D.1. The test shall be performed both with the shown and with the reversed connection of the primary side of the transformer. The test setup see below:



#### 3.11.2 TEST DATA

<b>Environmental Condition:</b>	Temperature: 23°C	Humidity: 48%	Pressure: 101kPa
<b>Power Supply:</b>	AC 230V 50Hz	<b>Test Mode:</b>	Normal Operation
<b>Tested By:</b>	Elite Wu	<b>Total Result:</b>	Pass

Cable	Frequency Band (Hz)	Disturbing Voltage (V)	Required Criterion	Performance Criterion	Result
AC mains	140 ~ 360	10	A	A	Pass
AC mains	The amplitude unbalance test is made with a 230:5 transformer typically connected for a 230V		A	A	Pass

**Note:** There was no change compared with initial operation during and after the test.

## TEST REPORT

### 4 PHOTOS

Product Photos:



\*\*\*\*\*End of Report\*\*\*\*\*