

Produkte
Products

Prüfbericht - Nr.: 15006666 008		Seite 1 von 19	
<i>Test Report No.:</i>		<i>Page 1 of 19</i>	
Auftraggeber:		Bestway Inflatables & Material Corp.	
<i>Client:</i>		No. 3065 Cao An Road, Shanghai 201812, P.R. China.	
Gegenstand der Prüfung: Air Pump			
<i>Test item:</i>			
Bezeichnung:	#62056	Serien-Nr.:	N/A
<i>Identification:</i>		<i>Serial No.:</i>	
Wareneingangs-Nr.:	153126931	Eingangsdatum:	06.08.2009
<i>Receipt No.:</i>		<i>Date of receipt:</i>	
Prüfort:	Refer to section 1.1		
<i>Testing location:</i>			
Prüfgrundlage:	EN 55014-1:2006		
<i>Test specification:</i>	EN 55014-2:1997+A1		
	EN 61000-3-3:1995+A1+A2		
	EN 61000-3-2:2006		
Prüfergebnis:	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).		
<i>Test Result:</i>	<i>The test item passed the test specification(s).</i>		
Prüflaboratorium:	TÜV Rheinland (Shanghai) Co., Ltd.		
<i>Testing Laboratory:</i>			
geprüft/ tested by:		kontrolliert/ reviewed by:	
03.09.2009 Fan Bo/PE		03.09.2009 Li Yanhua/TC	
<i>Datum</i>	<i>Name/Stellung</i>	<i>Unterschrift</i>	<i>Unterschrift</i>
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	<i>Signature</i>
		<i>Fan Bo</i>	<i>Li Yanhua</i>
Sonstiges/ Other Aspects:			
This report is for performing all tests on the above model again which was already EMC tested in 15006666 001-007 and issuing a new EMC report.			
Abkürzungen:		Abbreviations:	
<i>P(ass)</i>	= entspricht Prüfgrundlage	<i>P(ass)</i>	= passed
<i>F(ail)</i>	= entspricht nicht Prüfgrundlage	<i>F(ail)</i>	= failed
<i>N/A</i>	= nicht anwendbar	<i>N/A</i>	= not applicable
<i>N/T</i>	= nicht getestet	<i>N/T</i>	= not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.			
<i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>			

Prüfbericht - Nr.: 15006666 008

Test Report No.:

Seite 2 von 19

Page 2 of 19

TEST SUMMARY

4.1.1 HARMONICS ON AC MAINS

*Result:**Passed*

4.1.2 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER ON AC MAINS

*Result:**Passed*

4.1.3 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE

*Result:**Passed*

4.1.4 DISCONTINUOUS INTERFERENCE ON AC MAINS

*Result:**N/A*

4.2.1 DISTURBANCE POWER

*Result:**Passed*

5 IMMUNITY

*Result:**Passed*

Contents

1	TEST SITES	4
1.1	TEST FACILITIES	4
1.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	4
2	GENERAL PRODUCT INFORMATION	5
2.1	PRODUCT FUNCTION AND INTENDED USE.....	5
2.2	RATINGS AND SYSTEM DETAILS	5
2.3	INDEPENDENT OPERATION MODES	5
2.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	5
2.5	SUBMITTED DOCUMENTS.....	5
3	TEST SET-UP AND OPERATION MODES	6
3.1	PRINCIPLE OF CONFIGURATION SELECTION	6
3.2	PHYSICAL CONFIGURATION FOR TESTING	6
3.3	TEST OPERATION AND TEST SOFTWARE	6
3.4	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	6
3.5	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	6
4	TEST RESULTS EMISSION	7
4.1	EMISSION IN THE FREQUENCY RANGE UP TO 30 MHz	7
4.1.1	<i>Harmonics on AC Mains.....</i>	<i>7</i>
4.1.2	<i>Voltage changes, voltage fluctuations and flicker on AC mains</i>	<i>9</i>
4.1.3	<i>Mains Terminal Continuous Disturbance Voltage.....</i>	<i>10</i>
4.1.4	<i>Discontinuous Interference on AC Mains</i>	<i>13</i>
4.2	EMISSION IN THE FREQUENCY RANGE ABOVE 30 MHz.....	14
4.2.1	<i>Disturbance Power</i>	<i>14</i>
5	TEST RESULTS IMMUNITY.....	16
6	PHOTOGRAPHS OF THE TEST SET-UP	17
7	LIST OF TABLES.....	19
8	LIST OF FIGURES.....	19
9	LIST OF PHOTOGRAPHS	19

1 Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland (Shanghai) Co., Ltd.

**Address: 10-15/F, Huatsing Building, No. 88, Lane 777, West Guangzhong Road
Zhabei District, Shanghai 200072, P.R.China**

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

No.	Equipment	Model	Inventory no.	Cal. due date
1	EMI test receiver	ESIB26	100227	10.06.2010
2	Artificial mains network	NNB 42	04/10048	25.02.2010
3	Absorbing clamp	AMZ 41	20356	23.10.2010
4	Harmonic emission/voltage fluctuation and flicker test system	ProfLine 2105-400-413-LNS	55907&72292	10.06.2010

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an air pump for household and similar use. For the further information, refer to the user's manual.

2.2 Ratings and System Details

System input voltage : AC 220-240V
Frequency : 50Hz
Rated input : 85W
Protection class : II

2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off", without power regulation means.
Refer to the circuit diagram for further information.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the circuit diagram for further information.

2.5 Submitted Documents

Rating label and circuit diagram.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible emission level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

Immunity:

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

3.5 Countermeasures to achieve EMC Compliance

The tested sample contained noise suppression capacitor and inductors as described in circuit diagram. No special measure is employed to achieve the requirement.

Prüfbericht - Nr.: 15006666 008

Test Report No.:

Seite 7 von 19

Page 7 of 19

4 Test Results EMISSION

4.1 Emission in the Frequency Range up to 30 MHz

4.1.1 Harmonics on AC Mains

Result:	Passed
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Date of testing : 25.08.2009
Test procedure : EN 61000-3-2:2006
Test duration : 2.5min
Harmonic order : 2 – 40th
Frequency range : 0 – 2kHz
Test voltage : AC 232.23V; 50Hz
Ambient condition : Temperature: 23.5°C; Relative humidity: 43%
Following are the measurement results, which were obtained via an automatic measurement system.

Table 2: Harmonic currents measurement result

Equipment category: Class A;

Fundamental current I1: 0.415A; Power factor: 0.990; Active input power: 96.0W.

Harmonic order	Measured result (A)	Limits (A)	Harms(max) (A)	150%Limit (A)	Result
2	0.001	1.080	0.002	1.620	Pass
3	0.038	2.300	0.040	3.450	Pass
4	0.001	0.430	0.001	0.645	Pass
5	0.005	1.140	0.005	1.710	Pass
6	0.001	0.300	0.001	0.450	Pass
7	0.002	0.770	0.002	1.155	Pass
8	0.001	0.230	0.001	0.345	Pass
9	0.001	0.400	0.001	0.600	Pass
10	0.001	0.184	0.001	0.276	Pass
11	0.001	0.330	0.001	0.495	Pass
12	0.001	0.153	0.001	0.230	Pass
13	0.001	0.210	0.001	0.315	Pass
14	0.001	0.131	0.001	0.197	Pass
15	0.001	0.150	0.001	0.225	Pass
16	0.001	0.115	0.001	0.173	Pass
17	0.001	0.132	0.001	0.199	Pass
18	0.001	0.102	0.001	0.153	Pass
19	0.001	0.118	0.001	0.178	Pass
20	0.001	0.092	0.001	0.138	Pass
21	0.001	0.107	0.001	0.161	Pass
22	0.001	0.084	0.001	0.125	Pass
23	0.001	0.098	0.001	0.147	Pass
24	0.001	0.077	0.001	0.115	Pass
25	0.001	0.090	0.001	0.135	Pass
26	0.001	0.071	0.001	0.106	Pass
27	0.001	0.083	0.001	0.125	Pass
28	0.001	0.066	0.001	0.099	Pass
29	0.001	0.078	0.001	0.116	Pass
30	0.001	0.061	0.001	0.092	Pass
31	0.001	0.073	0.001	0.109	Pass
32	0.001	0.058	0.001	0.086	Pass
33	0.001	0.068	0.001	0.102	Pass
34	0.001	0.054	0.001	0.081	Pass
35	0.001	0.064	0.002	0.096	Pass
36	0.001	0.051	0.001	0.077	Pass
37	0.001	0.061	0.002	0.091	Pass
38	0.001	0.048	0.001	0.073	Pass
39	0.001	0.058	0.001	0.087	Pass
40	0.000	0.046	0.001	0.069	Pass

4.1.2 Voltage changes, voltage fluctuations and flicker on AC mains

Result:
Passed

Date of testing : 25.08.2009
 Test procedure : EN 61000-3-3:1995+A1+A2
 Ambient condition : Temperature: 23.5°C; Relative humidity: 43%

According to the characteristics of the sample, as specified by clause 5 of the basic standard, following limits apply:

- the value of $d(t)$ during a voltage change shall not exceed 3.3% for more than 500ms;
- the relative steady-state voltage change d_c , shall not exceed 3.3%;
- the maximum relative voltage change d_{max} , shall not exceed 4%.

The measurement was carried in accordance with Annex B of the basic standard. Following are the measurement results obtained via an automatic testing system.

Table 3: Voltage fluctuations and flicker measurement results

	d_c	$d_{max} (average)$	$d(t)$	P_{st}	P_{lt}
Limits	3.3%	4%	3.3%/500ms	N/A	N/A
Result	0%	0.72%	1.42%/0ms	-	-

4.1.3 Mains Terminal Continuous Disturbance Voltage

Result:	Passed
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Date of testing : 25.08.2009
Test procedure : EN 55014-1:2006 and CISPR 16-1 series standards
Frequency range : 0.15 - 30MHz
Kind of test site : shielded room
Ambient condition : Temperature: 23°C; Relative humidity: 43%

Test Setup

Input voltage : AC 264V; 50Hz
Operational mode : ON
Artificial hand : Applied
Earthing : No earthing. (as class II equipment)

The measurement setup was made according to EN 55014-1:2006 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and Artificial Mains Network (AMN) are in compliance with CISPR 16-1 series standards. The tested object was operated under its rated voltage and its rated frequency. Prior to the measurements the test object operated about 15 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

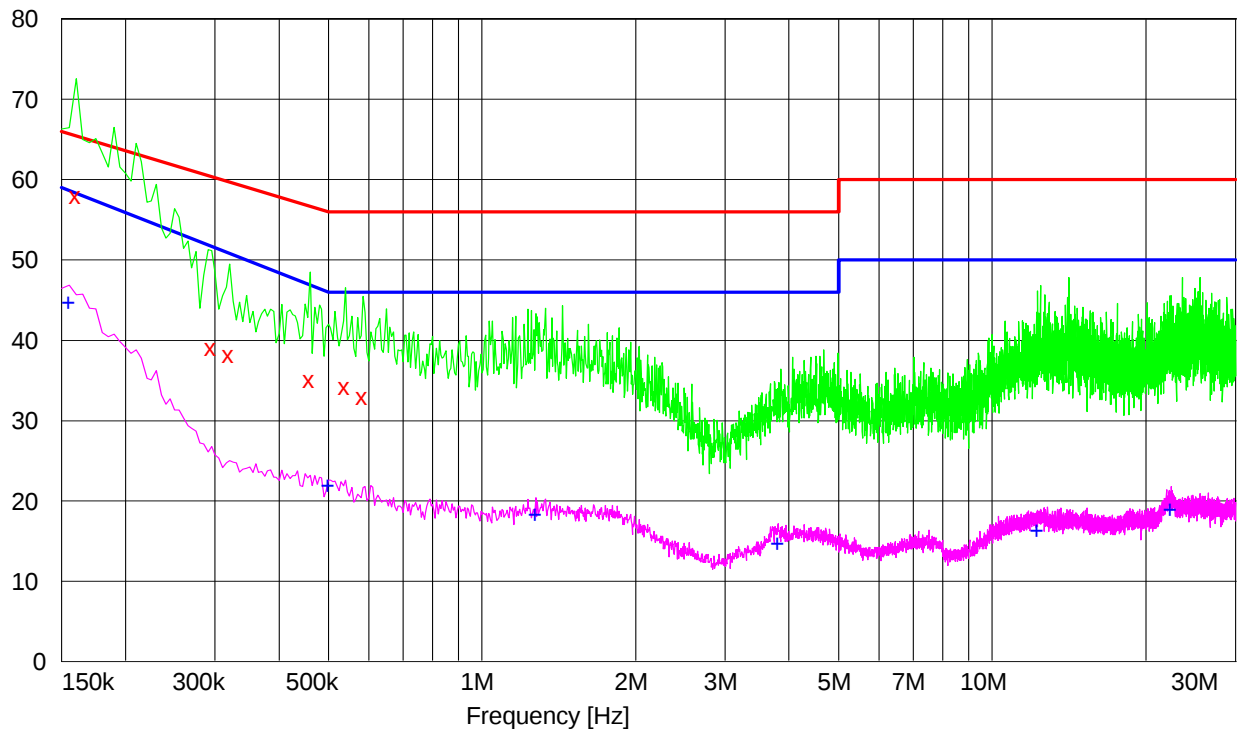
Furthermore an internal calibration with the test receiver was conducted prior to each measurement. Before measurement, a survey was made while the EUT with or without artificial hand to determine in which state the maximum disturbance was obtained. And the measurement was made in the state the maximum disturbance was obtained.

The tested object was set-up on a wooden table. The EUT was set 0.8m away from the AMN. The cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m. The EUT was wrapped with artificial hand which was earthed through the AMN.

The Interference Voltage was determined according to clause 5 of EN 55014-1:2006 while measuring the line and neutral conductor by turns.

The following figures and tables were those measured by an automatic measuring system. Both Quasi-Peak and Average Value were measured. Quasi-Peak and Average Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, "×" means Quasi-Peak Value and "+" means Average Value which was measured in final measurement.

Figure 1: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, L

Level [dB μ V]


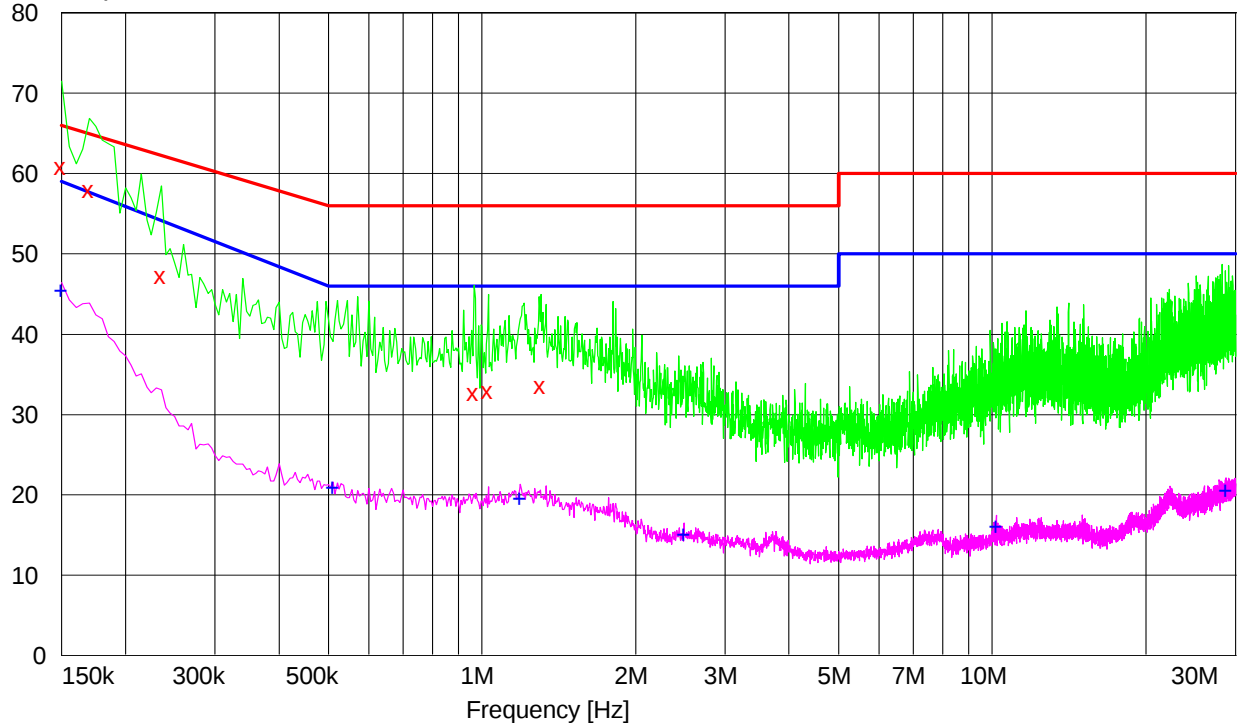
Final quasi-peak measurement results:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB
0.160000	58.00	20.7	65.5	7.5
0.295000	39.10	20.6	60.4	21.3
0.320000	38.20	20.6	59.7	21.5
0.460000	35.10	20.3	56.7	21.6
0.540000	34.30	20.3	56.0	21.7
0.585000	33.00	20.3	56.0	23.0

Final average measurement results:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB
0.155000	44.70	20.7	58.6	13.9
0.500000	21.90	20.3	46.0	24.1
1.275000	18.30	20.2	46.0	27.7
3.805000	14.60	20.5	46.0	31.4
12.285000	16.30	21.0	50.0	33.7
22.415000	19.00	21.0	50.0	31.0

Figure 2: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, N

Level [dB μ V]


Final quasi-peak measurement results:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB
0.150000	60.80	20.6	66.0	5.2
0.170000	58.00	20.5	65.0	7.0
0.235000	47.30	20.4	62.3	14.9
0.965000	32.70	20.3	56.0	23.3
1.030000	33.00	20.2	56.0	23.0
1.305000	33.60	20.2	56.0	22.4

Final average measurement results:

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB
0.150000	45.40	20.6	59.0	13.6
0.510000	20.90	20.4	46.0	25.1
1.190000	19.60	20.2	46.0	26.4
2.490000	15.10	20.2	46.0	30.9
10.205000	16.00	20.8	50.0	34.0
28.785000	20.50	21.2	50.0	29.5

Prüfbericht - Nr.: 15006666 008*Test Report No.:***Seite 13 von 19***Page 13 of 19***4.1.4 Discontinuous Interference on AC Mains****Result:****N/A**

4.2 Emission in the Frequency Range above 30 MHz

4.2.1 Disturbance Power

Result:	Passed
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Date of testing : 25.08.2009
Port : Mains
Basic standard : EN 55014-1:2006
Frequency range : 30 – 300MHz
Limit : EN 55014-1:2006, clause 4.1.2
Ambient condition : Temperature: 24°C; Relative humidity: 43%

Test Setup

Input voltage : AC 264V; 50Hz
Operational mode : ON
Earthing : No earthing(as class II equipment)

Measuring configuration and description

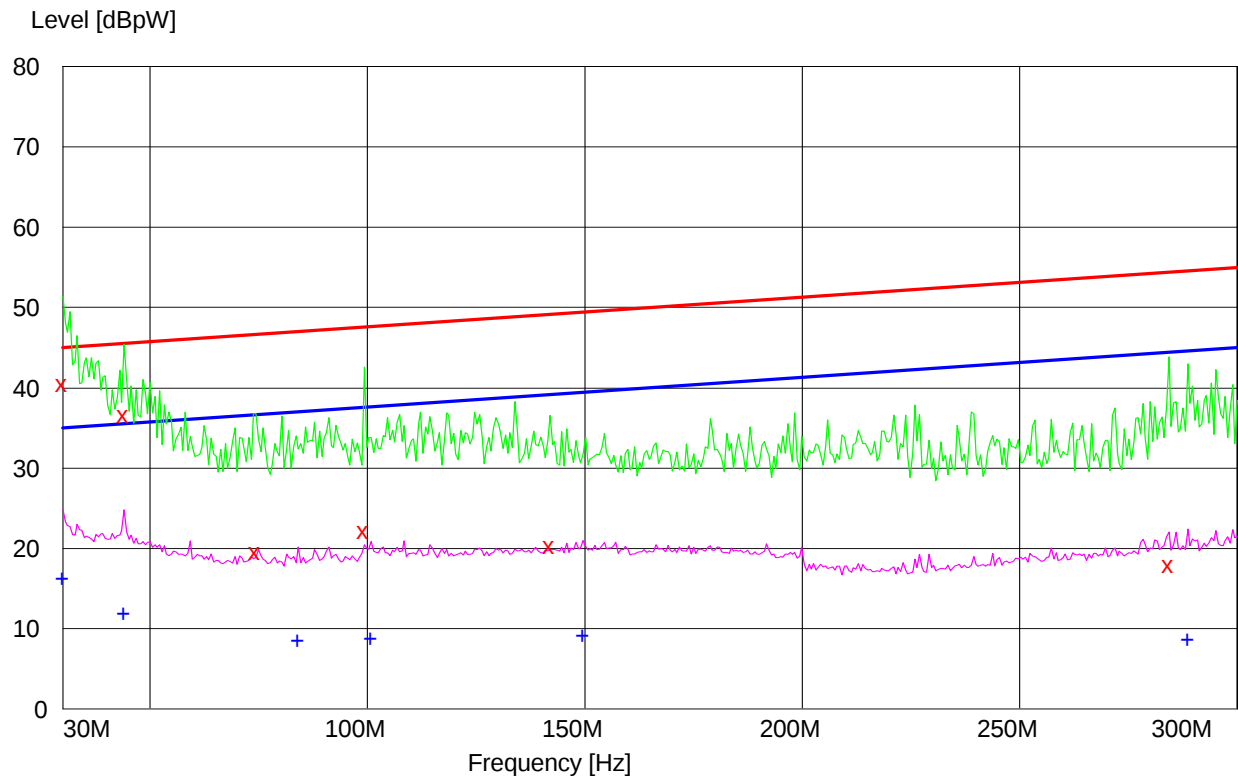
The measurement setup was made according to EN 55014-1:2006.

The measurement equipment like test receivers and absorption clamp are in compliance with CISPR 16-1 series standards. The test object has been operated under its rated voltage and rated frequency. Prior to the measurements the test objects operated about 10 minutes (warm-up) in order to stabilize their operating conditions and to ensure reliable measurement values.

Furthermore an internal calibration with the test receiver was conducted prior to each measurement.

The Disturbance Power was determined according to clause 6 of EN 55014-1:2006. The length of power cord of EUT plus that of the extension cord was 6.0m.

The measurement was performed by operating the EUT in normal operation mode. The figures and tables below were those measured in the operation mode. Both Quasi-Peak and Average Value were measured. In final measurement, by moving the absorption clamp along the power supply cord and the extension-power cord from the test object, Quasi-Peak and Average Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, “×” means Quasi-Peak Value and “+” means Average Value which was measured in final measurement.

Figure 3: Spectral Diagrams, Disturbance Power, Mains, 30 - 300MHz


Final quasi-peak measurement results:

Frequency MHz	Level dBpW	Transd dB	Limit dBpW	Margin dB
30.000000	40.60	8.1	45.0	4.4
44.068136	36.60	8.9	45.5	8.9
74.368737	19.60	5.2	46.6	27.1
99.258517	22.20	5.2	47.6	25.4
142.004008	20.30	5.5	49.1	28.8
284.308617	18.00	6.1	54.4	36.4

Final average measurement results:

Frequency MHz	Level dBpW	Transd dB	Limit dBpW	Margin dB
30.000000	16.30	8.1	35.0	18.7
44.068136	11.90	8.9	35.5	23.6
84.108216	8.50	5.2	37.0	28.5
100.881764	8.80	5.2	37.6	28.8
149.579158	9.10	5.8	39.4	30.3
288.637275	8.70	6.2	44.6	35.9

5 Test Results I M M U N I T Y

The immunity test was not necessary for the EUT because it belongs to category I apparatus according to EN 55014-2:1997+A1, i.e.,

“Category I: Apparatus containing no electronic control circuitry, for example motor operated appliances, toys, tools, heating appliances and similar apparatus (such as UV and IR radiators).

Electric circuits consisting of passive components (such as. radio interference suppression capacitors or inductors, mains transformers and mains frequency rectifiers) are not considered to be electronic control circuitry.”

According to clause 7.2.1 of EN 55014-2:1997+A1, the EUT is deemed to fulfill the relevant immunity requirements without actual testing.

6 Photographs of the Test Set-Up

Photograph 1: Set-up for measurement of harmonics and voltage fluctuation



Photograph 2: Set-up for measurement of disturbance voltage



Prüfbericht - Nr.: 15006666 008

Test Report No.:

Seite 18 von 19

Page 18 of 19

Photograph 3: Set-up for measurement of disturbance power



7 List of Tables

Table 1: List of Test and Measurement Equipment	4
Table 2: Harmonic currents measurement result.....	8
Table 3: Voltage fluctuations and flicker measurement results	9

8 List of Figures

Figure 1: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, L	11
Figure 2: Spectral Diagrams, Conducted Emission, 150kHz - 30MHz, N.....	12
Figure 3: Spectral Diagrams, Disturbance Power, Mains, 30 - 300MHz	15

9 List of Photographs

Photograph 1: Set-up for measurement of harmonics and voltage fluctuation	17
Photograph 2: Set-up for measurement of disturbance voltage.....	17
Photograph 3: Set-up for measurement of disturbance power	18