

EMC

TEST REPORT

Report No.: TS11020117-EME
Model No.: NS-PSE, NS-POINTED, NS-PSQUARE,
NS-PF-S, NS-PT, NS-PR, NS-PU, NS-PF-H,
NS-BALIBA, NS-FLEXMA
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Test Method/ Standard: EN 61000-6-3: 2007
IEC 61000-3-2: 2005+A2: 2009
IEC 61000-3-3: 2008
EN 61000-6-1: 2007

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2004).

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1. General Information

1.1 Identification of the EUT

Product:	Massage Pillow Series With Vibrator Units
Model No.:	NS-PSE
Rated Power:	DC 3 V
Power Cord:	N/A
Sample receiving date:	Feb. 23, 2011
Sample condition:	Workable
Testing date:	Feb. 24, 2011

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Note 2: The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.

Note 3: When determining the test conclusion, the Measurement Uncertainty of test has been considered.

1.2 Additional information about the EUT

The customer confirmed the models NS-POINTED 、 NS-PSQUARE 、 NS-PF-S 、 NS-PT 、 NS-PR 、 NS-PU 、 NS-PF-H 、 NS-BALIBA and NS-FLEXMA are series models to NS-PSE (EUT), for these models are identical in hardware aspect.

MOTOR: "MABUCHI" brand motor RC-260RA-21785A.

The vibrator unit information please see listed as below.

Vibrator Unit	Model No
NS-VS	NS-POINTED 、 NS-PSQUARE 、 NS-PF-S NS-PF-H
NS-VSL	NS-PT 、 NS-PR 、 NS-PU 、 NS-PSE
NS-VD	NS-PSE

For more detail features, please refer to user's Manual.

2. Test Summary

<i>Emission (EN 61000-6-3: 2007)</i>			
Standard	Test Type	Result	Remarks
CISPR 16-2-3: 2006	Conducted Test	N/A	N/A
	Radiated Test	PASS	Meet the requirements
IEC 61000-3-2: 2005+A2: 2009	Harmonic current emissions	N/A	N/A
IEC 61000-3-3: 2008	Voltage fluctuation & flicker	N/A	N/A

<i>Immunity (EN 61000-6-1: 2007)</i>				
Standard	Test Type	Performance Criteria	Result	Test Judgment
IEC 61000-4-2: 2008	ESD test	Criterion B	PASS	Meets the requirements of Performance Criterion A
IEC 61000-4-3: 2010	RS test	Criterion A	N/A	N/A
IEC 61000-4-4: 2004	EFT test	Criterion B	N/A	N/A
IEC 61000-4-5: 2005	Surge test	Criterion B	N/A	N/A
IEC 61000-4-6: 2008	CS test	Criterion A	N/A	N/A
IEC 61000-4-8: 2009	Magnetic Field test	Criterion A	N/A	N/A
IEC 61000-4-11: 2004	Dip test	1. 100% reduction- Performance Criterion B 2. 100% reduction- Performance Criterion B 3. 30% reduction- Performance Criterion C 4. 100% reduction- Performance Criterion C	N/A	N/A

3. Test Specifications

3.1 Standards

EN 61000-6-3: 2007 Electromagnetic Compatibility Generic emission standard — For Residential, commercial and light industry environments.

CISPR 16-2-3: 2006 Specification for radio disturbance and immunity measuring apparatus and methods-Part 2-3: Methods of measurement of disturbances and immunity-Radiated disturbance measurements.

IEC 61000-3-2: 2005+A2: 2009 Electromagnetic compatibility — Part 3. Limits Section 2. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

IEC 61000-3-3: 2008 Electromagnetic compatibility — Part 3. Limits Section 3. Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A

EN 61000-6-1: 2007 Electromagnetic compatibility - Generic immunity standard — For Residential, commercial and light industry environments.

3.2 Performance criteria

The performance criterias listed below are based on those regulated in the standard, specified by the manufacturer or derived from the product specification.

Criteria A:

The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criteria B:

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criteria C:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

3.3 Performance verification

The EUT has been monitored based on manufacturer's specification; the performance fulfilled the requirements of standard.

3.4 Mode of operation during the test

The EUT was supplied with DC 3 V from battery and was tested in normal operating mode during all the tests.

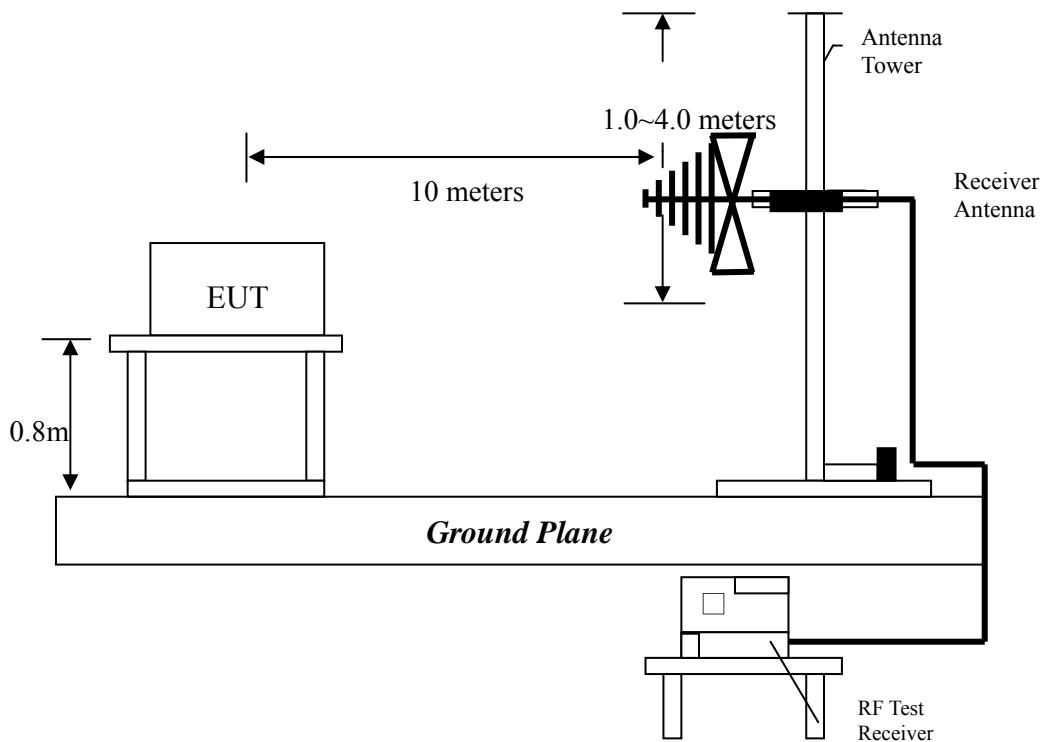
4. Conducted Emission Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

5. Radiated Emission Test

5.1.1 Test Procedure from 30 MHz to 1000 MHz

The figure below shows the test setup, which is utilized to make these measurements.



Radiated testing was performed at a 10 meters open area test site. The equipment under test were placed on a turntable top 0.8 meter above ground. The table was 360 degrees to determine the position of the highest radiation. EUT is set 10 meters from the EMI receiving antenna, which is mounted on a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength. Both horizontal polarization and vertical polarization of the antenna was set to conduct the measurement.

The bandwidth was set on the EMI meter 120 kHz.

The levels are quasi peak value readings. The frequency spectrum from 30 MHz to 1000 MHz was investigated.

5.1.2 Test Equipment

Equipment	Brand	Model No.
EMI Receiver	Rohde & Schwarz	ESCS 30
Bilog Antenna	Schaffner	CBL6112B

Note: The above equipments are within the valid calibration period.

5.1.3 Radiated Emission Limit

Frequency (MHz)	Distance(m)	QP(dB μ V)
30~230	10	30
230~1000	10	37

Note:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument Antenna and the closest point of EUT.

5.1.4 Uncertainty of Radiated Emission

Expanded uncertainty (k=2) of radiated emission measurement is ± 4.96 dB.

5.1.5 Radiated Emission Test Data from 30 MHz to 1000 MHz

Polarity:	Vertical			
Temperature:	25	°C	Model No.:	NS-PSE
Relative Humidity:	58	%	Operating mode:	Refer to section 3.4
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Calculated (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
156.09000	8.82	3.03	6.55	18.40	30	-11.60
165.00000	9.41	3.03	4.66	17.10	30	-12.90
197.40000	10.19	3.13	6.08	19.40	30	-10.60
470.00000	16.97	4.75	3.28	25.00	37	-12.00
521.20000	18.39	5.48	2.63	26.50	37	-10.50
816.60000	21.50	6.30	0.10	27.90	37	-9.10

Remark:

1. Calculated level (dB μ V/m)= Correction Factor (dB/m)+ Meter Reading (dB μ V)
2. Correction Factor = Ant. Factor (dB/m) + cable loss (dB)
3. Margin Value = Calculated level- Limit Value
4. “*” Undetectable

Polarity:	Horizontal			
Temperature:	25	°C	Model No.:	NS-PSE
Relative Humidity:	58	%	Operating mode:	Refer to section 3.4
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Calculated (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
162.84000	8.78	3.03	6.39	18.20	30	-11.80
171.21000	8.84	3.03	5.23	17.10	30	-12.90
252.75000	11.42	3.50	9.38	24.30	37	-12.70
379.10000	15.78	4.33	6.79	26.90	37	-10.10
496.70000	17.88	4.75	1.57	24.20	37	-12.80
551.30000	17.69	5.48	0.03	23.20	37	-13.80

Remark:

1. Calculated level (dB μ V/m)= Correction Factor (dB/m)+ Meter Reading (dB μ V)
2. Correction Factor = Ant. Factor (dB/m) + cable loss (dB)
3. Margin Value = Calculated level- Limit Value
4. “*” Undetectable

6. Harmonics Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

7. Voltage Fluctuations-Flicker Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

8. Electrostatic Discharge Immunity Test

8.1 Purpose

The object of the test is to evaluate the ESD immunity performance of EUT.

8.2 Test Set-Up

A horizontal coupling plane (HCP) was placed on a non-metallic table 0.8 meter above a reference ground plane (RGP) and connected to it with a cable with two 470 kΩ resistors. The EUT was placed on an insulation sheet on the HCP and was operated according to the specified operating mode.

A vertical coupling plane (VCP) was connected to the RGP with a cable with two 470 kΩ resistors.

8.3 Test Specification

Test level: Air discharge ----- +/- 8 kV
 Contact discharge ----- +/- 4 kV

Single discharge at 1 second interval positive discharge and negative discharge

The selected test points are listed in this table, the numbers refer to the figures attached.

8.4 Test Equipment

Equipment	Manufacturer	Model No.
Electrostatic Discharge System	NoiseKen	ESS-2002

Note: The above equipments are within the valid calibration period.

8.5 Test Result

Temperature:	25	°C	Model No.:	NS-PSE
Relative Humidity:	50	%	Operating mode:	Refer to section 3.4
Atmospheric Pressure:	1008	hPa	Remark:	N/A

Point of Discharge	Applied Voltage (kV)	Total No. of Discharge (Each Point)	Result	Remark
Contact Test Point	±2	20	PASS	Criterion A
	±4	20	PASS	Criterion A
Air Test Point	±2	20	PASS	Criterion A
	±4	20	PASS	Criterion A
	±6	20	PASS	Criterion A
	±8	20	PASS	Criterion A
VCP (4 sides)	±2	20	PASS	Criterion A
	±4	20	PASS	Criterion A
HCP (4 sides)	±2	20	PASS	Criterion A
	±4	20	PASS	Criterion A

Description of Discharge Point

Contact Discharge 1 Test points		Air Discharge	
<input type="checkbox"/>	Metallic Screws	<input type="checkbox"/>	Plastic Screws
<input type="checkbox"/>	Metallic Case	<input type="checkbox"/>	Plastic Case (gap)
<input checked="" type="checkbox"/>	Metallic Connect ports	<input type="checkbox"/>	Plastic Connect ports
<input type="checkbox"/>	Metallic Junctions	<input type="checkbox"/>	Plastic Junctions
<input type="checkbox"/>	Others:	<input type="checkbox"/>	LED indicator
		<input type="checkbox"/>	Panel Board
		<input checked="" type="checkbox"/>	Others: Enclosure

9. Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

After engineer judgment, no tests were considered necessary.

10. Electrical Fast Transient/Burst Immunity Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

11. Surge Immunity Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

12. Immunity to Conducted Disturbances, Inducted by Radio-Frequency Fields

Since the EUT is not connected to AC source, therefore, the test can be waived.

13. Power Frequency Magnetic Field Immunity Test

The equipment does not contain components susceptible to magnetic fields; therefore, the test can be waived

14. Voltage Dips, Short Interruptions and Voltage Variations Immunity Test

Since the EUT is not connected to AC source, therefore, the test can be waived.

Appendix A1: External photo of EUT (Model No: NS-PSE)



Appendix A2: External photo of Series Model (Model No: NS-POINTED)



Appendix A3: External photo of Series Model (Model No: NS-PSQUARE)



Appendix A4: External photo of Series Model (Model No: NS-PF-H)



Appendix A5: External photo of Series Model (Model No: NS-PF-S)



Appendix A6: External photo of Series Model (Model No: NS-PU)



Appendix A7: External photo of Series Model (Model No: NS-PT)



Appendix A8: External photo of Series Model (Model No: NS-PR)



Appendix A9: External photo of Series Model (Model No: NS-BALIBA)



Appendix A10: External photo of Series Model (Model No: NS-FLEXMA)

