



Model No.
NFP-ELV080935

SPECIFICATIONS

This specification applies to NFP-ELV080935 Linear Vibration Motors.

1. Applicable scope

This specification provided by NFP-Motor is applied to model NFP-ELV080935 linear resonant actuator, which is used for cellular phone and other handy communication tools.

2. Applicable conditions

No.	Item	Specification	Notes
2-1	Rated Voltage	0.9Vrms AC	Input voltage should be lower than 0.9Vrms
2-2	Work Voltage	0.1-0.95Vrms AC	The linear vibrator can vibrate below the rated voltage; while can vibrate over the rated voltage with no problem
2-3	Vibration Direction	X axis	The vibration direction is defined as the product length direction
2-4	Operating Environment	-20°C~+70°C, Ordinary Humidity:0-95%RH	No condensation of moisture
2-5	Input Frequency	170 Hz	Resonant Frequency
2-6	Storage Conditions	-40°C~+85°C, Ordinary Humidity:65±20%RH	No condensation of moisture

3. Measurement Conditions

Normally, the vibrator could be measured under 22~28°C, 45~85%RH. For coherence, it must be measured under below environment requirements.

No.	Item	Specification
3-1	Temperature	25°C±3°C
3-2	Humidity	65±20%RH
3-3	Air Pressure	1011±40 hpa

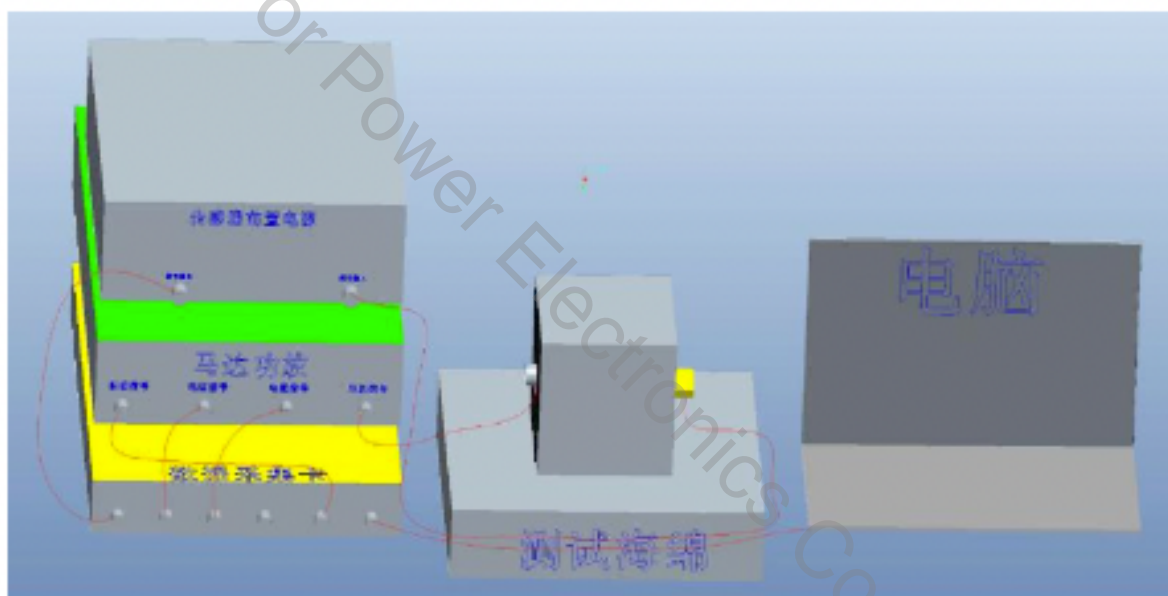
4. Characteristics Standard

No.	Item	Specification	Test Condition
4-1	Rated Voltage	0.9Vrms AC, Sine wave	0.9Vrms AC, Sine wave
4-2	Rated Frequency	170Hz	@nominal rated voltage
4-3	Rated Current	Max 145mA Arms	0.9Vrms AC, F0, sine wave Refer to Figure 1
4-4	Acceleration	Min 0.52 Grms	0.9Vrms AC, F0, sine wave
4-5	Frequency Characteristics	170±10Hz	Resonant Frequency
4-6	Transient vibration acceleration	0.90+/-0.15Gp	9Vp+1cycle sine wave@F0
4-7	Rise Time	Max 100ms The time from 0 up to 90% maximum acceleration.	170Hz, 0.9Vrms AC, sine wave
4-8	Falling Time	Max 130ms The decay time free fall acceleration from 100% down to 10%.	170Hz, 0.9Vrms AC, sine wave
4-9	Insulation Resistance	10MΩ Min (100V)	Min 10MΩ@100V DC between terminal and housing
4-10	Resistance	8.0±1.0 Ohm	25°C±3°C

5. Mechanical characteristics

No.	Item	Specification	Test Conditions
5-1	Noise	45 dBA Max. 10cm distance from microphone	170Hz, 0.9Vrms AC, sine wave/ 9Vp+1cycle sine wave Background noise 28dBA Max.
5-2	Vibrator Size	L9.0*W8.0*H3.5 mm	micrometer calipers

6. Test Method



Linear Vibrator Test Method

Note:

- The dimension and weight of test jig: 40mm*40mm*40mm, weight:100g.
- The motor should be fixed by cross the center of test jig.
- The acceleration sensor should be fixed on the opposite of motor.

7. Reliability characteristics

7-1 Mechanical test

No.	Item	Test Condition	Judgment	Quantity
7-1-1	Static-pressure test	50N, 1min	After the test, the 7.5 condition A pass criteria must be satisfied and obvious deformation is not allowed, the height meet $3.5\pm 0.05\text{mm}$.	20
7-1-2	Tumbling test	220g \pm 5g test jig (the motor contained), half a meter high, 500 times, the contact surface is steel base, 10-12 per minute recommended.	After the test, the 7.5 condition A pass criteria must be satisfied and obvious deformation is not allowed, the height meet $3.5\pm 0.05\text{mm}$.	20
7-1-3	Free fall	220g \pm 5g test jig (the motor contained), drop from 1.5m, the contact surface is monto granite base, six faces and four corners with three cycles.	After the test, the 7.5 condition A pass criteria must be satisfied and obvious deformation is not allowed, the height meet $3.5\pm 0.05\text{mm}$.	20
7-1-4	Vibration test	The motor fixed fixture weight 220g \pm 5g, Frequency: 5~500Hz, PSD = $0.04\text{g}^2/\text{Hz}$ Do the test for one hour per three straight shaft directions.	After the test, the 7.5 condition A pass criteria must be satisfied and obvious deformation is not allowed, the height meet $3.5\pm 0.05\text{mm}$.	20
7-1-5	Micro-drop test	220g \pm 5g test jig(the motor contained), drop from 0.1m, six faces with 500 times each for one cycle, six cycles.	After the test, the 7.5 condition A pass criteria must be satisfied and obvious deformation is not allowed, the height meet $3.5\pm 0.05\text{mm}$.	20

7-2 Environmental test

No.	Item	Test Condition	Judgment	Quantity
7-2-1	High temperature storage test	The temperature rise 1°C per minute to 85°C from normal temperature, and stay for 96 hours, then drop 1°C per minute to normal temperature, pick out after two hours. Temperature: 85±2°C Time: 96hs	After the test, the 7.5 condition B pass criteria must be satisfied.	20
7-2-2	Low temperature storage test	The temperature drop 1°C per minute to -40°C from normal temperature, and stay for 96 hours, then rise 1°C per minute to normal temperature, pick out after two hours. Temperature: -40±2°C Time: 96 hours	After the test, the 7.5 condition B pass criteria must be satisfied.	20
7-2-3	Temperature shock	-40°C@ 30 minutes and 85°C@ 30 minutes, the exchange time within 20 seconds, 50 cycles.	After the test, the 7.5 condition B pass criteria must be satisfied.	20
7-2-4	Temperature and humidity test	The temperature rise 1°C per minute to 85°C, with 85%RH, for 500 hours.	After the test, the 7.5 condition B pass criteria must be satisfied.	20
7-2-5	Salt spray test	The five percentage NaCl solutions(by mass) is sprayed continuously for 24 hours at 35°C, then remove the products from the test condition, one cycle.	Stop the test at any time, the crust and FPC pad corrosion situation must meet the specification request.	20
7-2-6	Temperature Humidity storage test	The deep blue is temperature curve, and the light blue is humidity curve. Two cycles following the above temperature-humidity curve.	After the test, the 7.5 condition B pass criteria must be satisfied.	20

7-3 Lifetime test

No.	Item	Test Condition	Judgment	Quantity
7-3-1	Lifetime test at normal temperature	F0 pure sine wave drive at rated voltage, 2.0s on/ 1.0s off, one million cycles at room temperature.	After the test, the 7.5 condition A pass criteria must be satisfied.	20
7-3-2	Long-term lifetime with temperature	2sON/1sOFF-20 °C~55°C, stay 30 minutes per 10°C /min, total 78 cycles. 2sON/1sOFF	After the test, the 7.5 condition A pass criteria must be satisfied.	20
7-3-3	High temperature and humidity life	The temperature rise 1°C per minute to 65°C, with 95%RH, F0 pure sine wave drive at rated voltage for 44hours, then drop 1°C per minute to normal temperature, pick out after two hours.	After the test, the 7.5 condition A pass criteria must be satisfied.	20
7-3-4	Continuous life	24 hours@-10°C, 24 hours@55°C, and 192 hours@25°C, total 240 hours, @rated voltage, @F0.	After the test, the 7.5 condition A pass criteria must be satisfied.	20

7-4 Jig and test methods

The surface compression of the motor is 10±5N in the test jig, and the detail drawings are determined by customers.

7-5 Requirements after reliable test

Test pass criteria

After reliability tests, all test samples must be meet the following conditions, otherwise they will be regarded as NG.

Condition A:

F0 variation: Within $\pm 8\text{Hz}$ of F0 measured before tests.

Operating current variation: $\leq 20\%$ (Within 20% of work current measured before tests)

Vibration variation: $\leq 20\%$ (Within 20% of Acceleration measured before tests @ F0)

Stop time variation within $\pm 20\text{ms}$ (Within 20ms of stop time measured before tests @ F0)

Noise: $\leq 48\text{dB}$ (Max 48dB(A))

Condition B:

F0 variation: Within $\pm 8\text{Hz}$ of F0 measured before tests.

Operating current variation: $\leq 10\%$ (Within 10% of work current measured before tests)

Vibration variation: $\leq 10\%$ (Within 10% of Acceleration measured before tests @ F0)

Stop time variation within $\pm 20\text{ms}$ (Within 20ms of stop time measured before tests @ F0)

Noise: $\leq 45\text{dB}$ (Max 45dB(A))

8. Points for Attentions

8-1 Make sure to use the motor in accordance with the specifications, if not, the lifetime might be reduced accordingly, pay high attention to the range of the voltage.

8-2 The motor is suggested using within 6 months. Do not use or store the motor under below environments:

8-2-1 High temperature and high humidity area;

8-2-2 Corrosive gas such as H_2S , SO_2 , NO_2 , Cl_2 ;

8-2-3 Dusty area;

8-3 Pay attention to the working environment of the motor, avoid any iron material sucked by the motor, or the motor might cause noise and the performance will be degraded, meanwhile, the reliability might be reduced.

8-4 Make sure the product will not violate any local relevant standards, as well as laws and regulations.

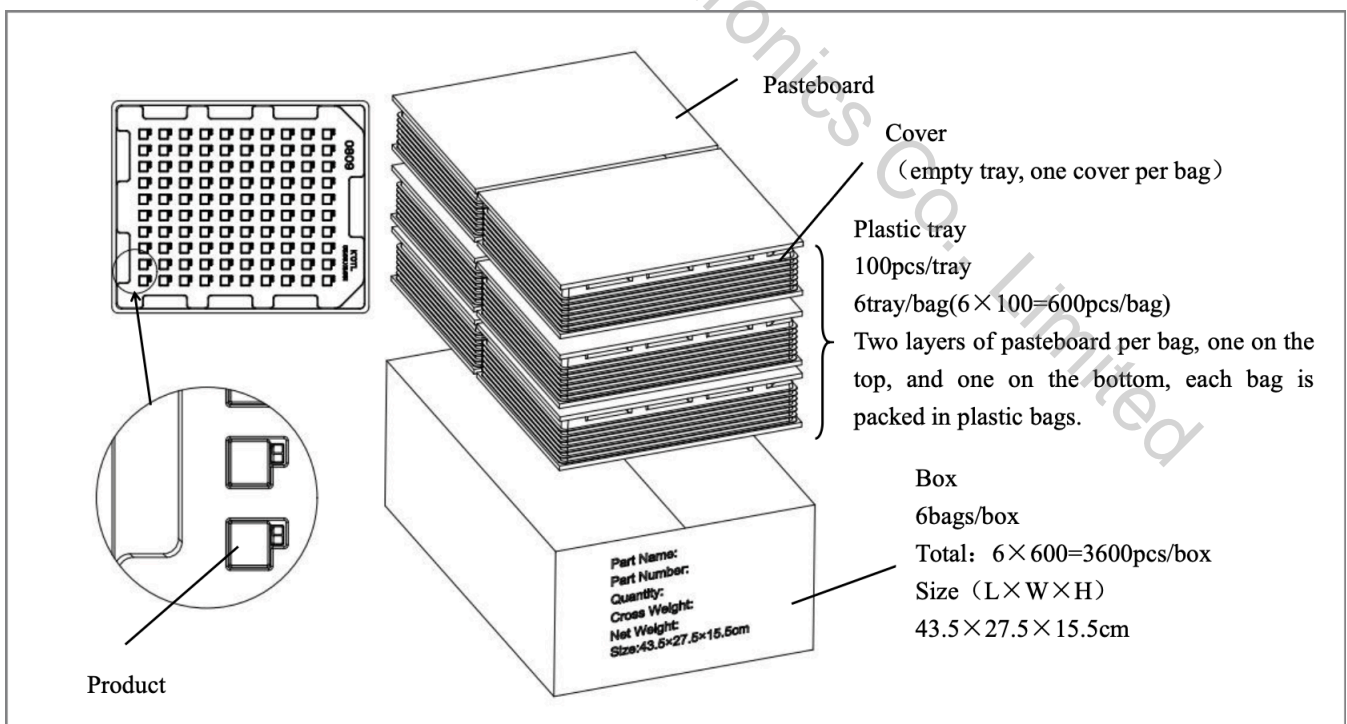
8-5 Handle with care.

8-6 A little rusty spot at the steel plate surface is allowed.

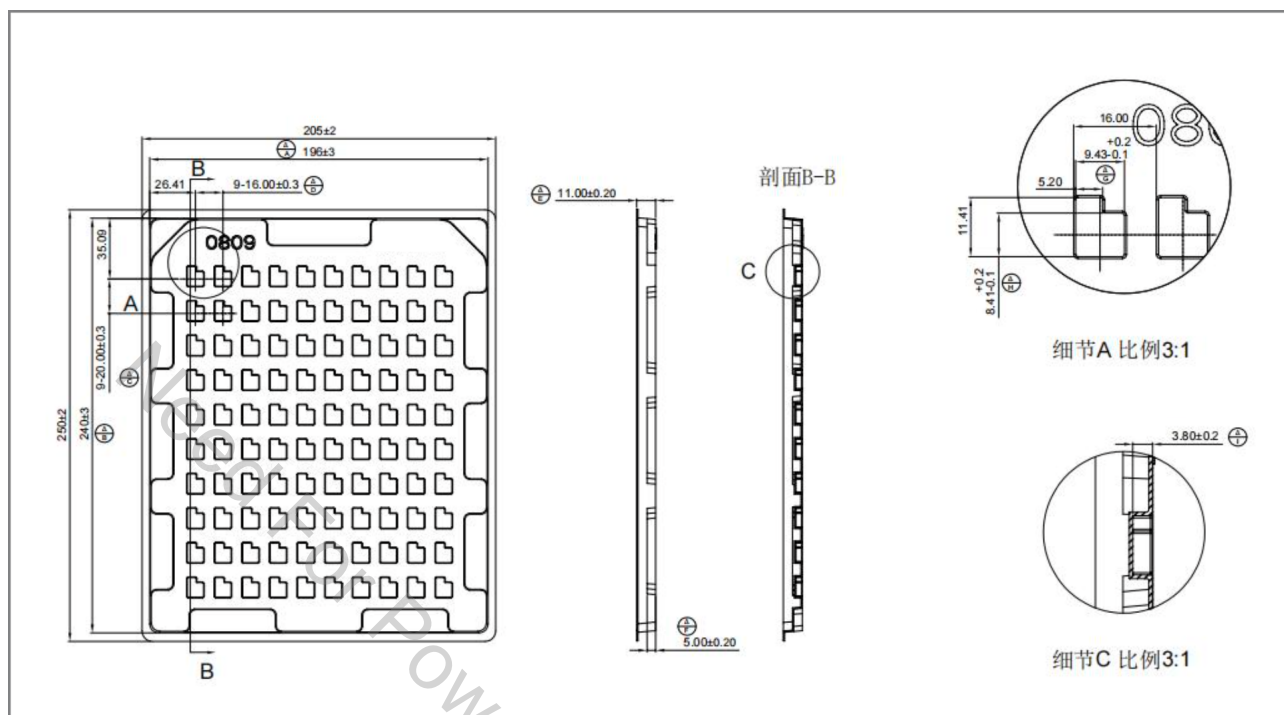
8-7 Our company would follow the sustainable developing strategy, and have the right to make change and improvements to our product without giving notice in advance. of course, these changes and improvements will not affect the characteristics and function of the motor.

9. Packaging specification

9-1 Packaging standard



9-2 Tray drawing



10. Product 2D drawing

