



Model No.

NFP-ELV451230

SPECIFICATIONS

This specification applies to NFP-ELV451230 linear vibration motor. This specification provided by NFP-Motor is applied to model NFP-ELV451230 linear resonant actuator, which is used for cellular phone and other handy communication tools.

1. Environmental protection

The motors meet the customer's requirements for environmental protection, and provide the corresponding environmental protection declaration form, material composition table (MCD) and third-party environmental protection test report about material.

2. Appearance

Inspection method: Visual method:

Environmental temperature: 15~35 °C, recommend 25 °C;

Relative humidity: 25%~75%;

Air pressure: 86~106kPa;

The distance between human eye and the surface of the object under test is 300mm-350mm;

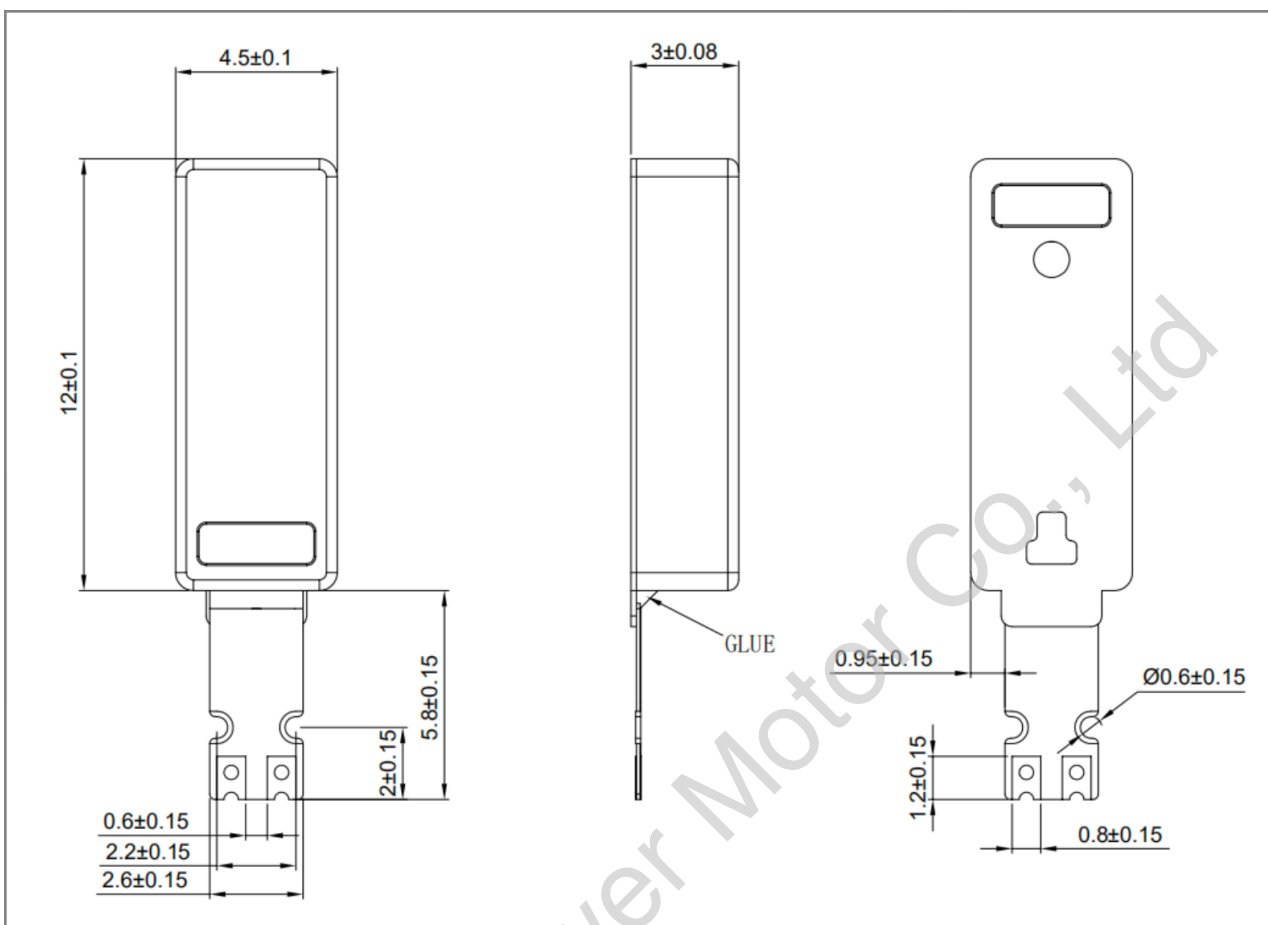
The viewing angle of surface and desktop is made up of 45°, then turn 45°up, down, left and right;

100W cool white fluorescent lamp, the light source is 500 mm~550mm away from the surface of the motor to be tested (illumination up to 800 Lux -1200 Lux);

The sign is clear, the appearance is clean, and the surface is free of obvious dents, scratches, peeling of coating, and blistering of plastic parts, cracking, deformation, mildew and other phenomena.

100% appearance inspection is guaranteed.

3. Configuration



This linear vibration motor include the following elements.

1. bracket, FPC, Coil, vibrator, magnetic plate, magnetic steel, leaf spring, chassis

4. Operating condition

No.	Item	Specification	Test Conditions
4-1	Operating environment	-20~70°C	No condensation of moisture (0~95% RH)
4-2	Storage environment	-40~85°C	No condensation of moisture (0~95% RH)

5. Conventional electrical parameters

No.	Item	Definition & Test Conditions	Specification	Note
5-1	Rated Voltage	The driving voltage value for the motor to work normally for a long time, is the test and use voltage.	1.8VrmsAC	
5-2	Work current	Under the rated working voltage, the working current of the motor.	100 mA Max	
5-3	Coil resistance	Normal performance resistance of the motor	$20 \pm 2\Omega$	At temperature $25 \pm 3^\circ\text{C}$
5-4	Resonance Frequency	The frequency point corresponding to the maximum peak-to-peak value of the acceleration curve when the motor vibrates stably under the rated voltage	$235 \pm 10\text{Hz}$	
5-5	Vibration direction		Z direction	
5-6	Rise time	After the rated driving voltage is applied, the acceleration rises from 0 to 90% of the time (sweep frequency F0)	100ms Max	
5-7	Fall time	After the rated driving voltage is removed, the time for the vibration amount to drop from 100% to 10% (frequency sweep F0)	180ms Max	
5-8	Vibration Acceleration	At rated voltage, measure the vibration acceleration of the motor, in G, take the rms value	Input Source: Motor F0, 1.8Vrms AC, sinewave	
5-9	Noise	Background noise: 28dBA Max.	$\leq 45\text{dB(A)}$, (10cm distance from decibel meter Input Source: Motor F0, 1.8Vrms AC, Sinewave)	
5-10	Insulation resistance	Test voltage 100VDC, insulation resistance between motor terminals and case	$\geq 10\text{M}\Omega$	

6. Test Method

Judgement methods	Judgement conditions
After the test is stopped, the product is placed at room temperature for 2 hours for visual inspection and functional test	Resonance frequency: within $\pm 5\%$ of initial value; Vibration: within $\pm 30\%$ of initial value; Working current: within $\pm 30\%$ of initial value; Stop time variation within $\pm 30\%$; Noise: Max 48dB(A); Other parameters meet the original specification requirements.

7. Mechanical properties

No.	Item	Test condition	Test method	Judgment	Sample quantity
7-1	Housing dismantling strength	20N, 1min	Apply a dismantling force of 20N in the axial direction to the upper cover and base for 1 minute	The riveting point of the casing is stable, no deformation, no disengagement	10
7-2	Stress strength	20N, 10min	Evenly apply 20N pressure to the front of the motor, the pressure head completely covers the surface of the motor, and keep it for 10 minutes	Test with the pressure removed to meet the judgment conditions	10
7-3	Tumbling box	0.5m, 1500 times	The motor is installed in a watch-like square carrier, which is rigid plastic and weighs 100g. A cover can be installed to protect the motor and avoid direct collision with the motor during the test.	After the test, the motor has no deformation, no parts drop, no noise, and the judgment conditions are met	10
7-4	Drop	1.5 meters, 6 faces and 4 corners, 3 rounds of granite drop faces in total.	The motor installation device is the same as 7-3 (the counterweight is 100g jig.) (The bottom of the drop is granite)	After the test, the motor has no deformation, no parts drop, no noise, and the judgment conditions are met	10

7-5	Random Vibration Test	XYZ three axes, each axis 1h (5~500Hz , PSD=0.08g ² /Hz	The motor mounting device is the same as 7-3 (weight 100g jig.) 3 axes, 60 minutes per axis	After the test, there is no deformation, no drop, no noise, and the judgment conditions are met	10
7-6	Micro-Drop	Height: 10cm, 6 sides, 500 times each, 1 cycle, 3000 times in total	The motor installation device is the same as 7-3 (the jig with a counterweight of 100g.) The bottom surface of the drop is a steel plate	After the test, there is no deformation, no drop, no noise, and the judgment conditions are met	10
7-7	FPC Pull-out force test	3N, 1min	(1)Check the appearance and performance of the sample before the test, which must meet the specification requirements; (2) Fix the sample to be tested on the platform of the precision load meter, connect the FPC to the drawing head, start the precision load meter, and the drawing head rises until the load Reach 3N; (3) Unload the load after maintaining the 3N load for 1 minute; (4) Check the appearance and performance of the sample.	After the test, there is no deformation, no drop, no noise, and the judgment conditions are met	10

8. Environmental performance

No.	Item	Test condition	Test method	Judgment	Sample quantity
8-1	High temperature Storage	85°C±2°C 96 hours	Store in an environmental test chamber, and then place at room temperature for 2 hours.	Meet the judgment conditions	10
8-2	Low temperature Storage	-40°C±2°C 96 hours	Store in an environmental test chamber, and then place at room temperature for 2 hours.	Meet the judgment conditions	10
8-3	Temperature shock	Low temperature: -40°C, high temperature 85°C, 24 cycles	After 60 minutes of low temperature storage, it was quickly put into a high temperature box for 60 minutes, the maximum switching time between high and low temperature was less than 20s, and a total of 24 cycles were completed. Then leave at room temperature for 2 hours.	Meet the judgment conditions	10
8-4	High temperature and humidity	85°C±2°C 85%RH 200 hours	The temperature was raised to 85°C at a rate of 1°C/min, and the humidity was kept at 85% RH for 200 hours	Meet the judgment conditions	10
8-5	Alternating temperature humidity	-10°C~55°C 95%RH Cycle twice according to the temperature and humidity curve.	<ol style="list-style-type: none"> 1. The humidity of the test chamber rises to 95% within 1 hour, and the temperature is kept at -10°C; 2. 3 hours linear temperature rise to 55°C, humidity maintained at 95%; 3. 55°C, humidity 95%, 9 hours; 4. 3 hours linear cooling to -10°C humidity maintained at 95%; 5. -10 °C, 95% humidity, 9 hours; 6. 2-5 is a cycle, after the test of total 2 times, leave it at room temperature for 2 hours. 	Meet the judgment conditions	10

9. Durability

No.	Item	Test condition	Test method	Judgment	Sample quantity
9-1	Lifetime at normal temperature	1 million cycles	Normal temperature, the drive voltage is set to the rated voltage, the overload voltage is the maximum allowable voltage, the drive frequency is the motor resonance frequency, with overload start and brake, 2sON/1sOFF	After the test, the test parameters meet the judgment conditions	20
9-2	Lifetime at high temperature and humidity	The temperature was raised to 65°C at a rate of 1°C/min and the humidity was maintained at 95% RH. Make the motor in the working state of 2s on and 1s off for a total of 24h. Use standard drive signal: drive voltage is set to rated voltage, 2sON/1sOFF signal drive.	1. Fix the sample to be tested on the tooling, connect the drive signal, and make the motor work under the standard drive signal; 2. Under normal temperature, the temperature rises to 65°C at a rate of 1°C/min, and the humidity is kept at 95 %RH, placed for 24 hours, then cooled to room temperature at a rate of 1°C/min, kept for 2 hours and taken out	After the test, the test parameters meet the judgment conditions	10
9-3	Haptic Lifetime	2 million times	Under normal temperature, rated working voltage amplitude, 100ms On, 400mS Off, test after 2 hours of recovery at normal temperature	After the test, the test parameters meet the judgment conditions	10

10. Package Specification

Tray packaging requirements

- 1) According to 100PCS/disk, 20 disks/small case (package), 2 small case (package)/ large case;
- 2) The motors are placed in the same direction in the Tray;
- 3) Tray trays are required to be designed as A/B molds with fool-proof notches;
- 4) The product name, model and factory name should be marked on the outside of the box.

