NEED-FOR-POWER MOTOR™

Model No.

NFP-WS0825

1. Application

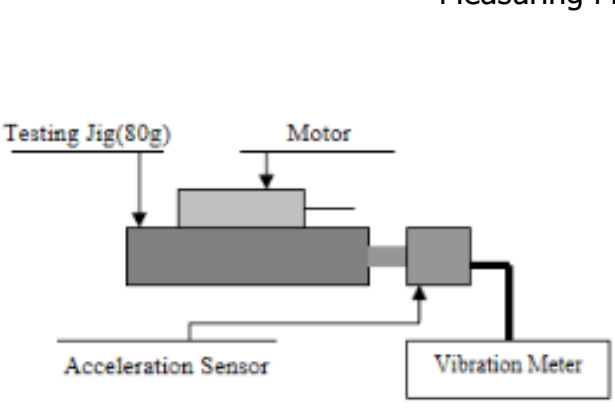
This article regulates the relevant technical requirements and test methods of model NFP-WS0825 BLDC Coin Vibration Motor.

2. Standard Operating Condition

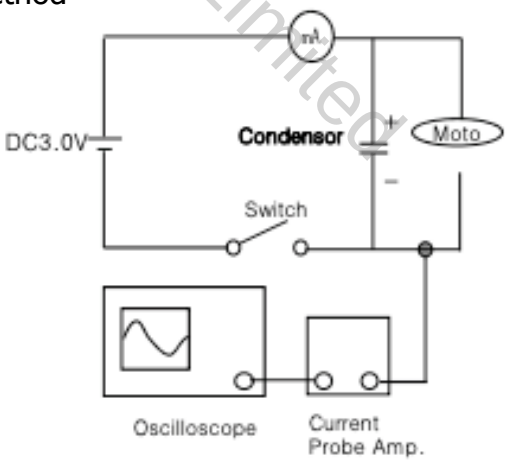
NO.	Item	Specification
2-1	Operating Voltage Range	DC 2.7V ~ 3.3V
2-2	Storage Temperature Range	-30 ~ +70 °C
2-3	Operating Temperature Range	-20~+60 °C However, there is decrease of rated load speed of the section 7-3 at -20°C compared to +25°C
2-4	Operating Position	All Direction

3. Standard Measurement Condition

NO.	Item	Specification
3-1	Temperature	20±5 °C
3-2	Humidity	65%±15% RH
3-3	Measurement Voltage	DC 3.0V
3-4	Measuring Method	



Standard Measurement State



Inspection Circuit Diagram

4. Judgment Environmental Condition

NO.	Item	Condition
4-1	Temperature	20±5 °C
4-2	Humidity	65%±15% RH

5. Test Tolerance

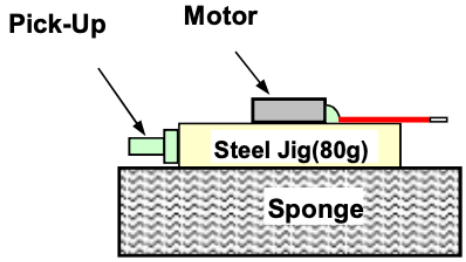
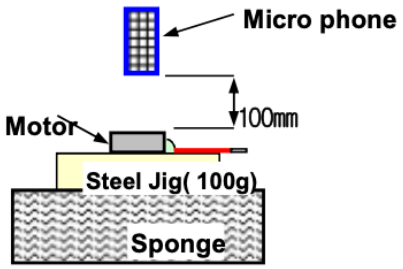
Test set-ups and equipment shall be capable of maintaining following condition, unless otherwise specified.

NO.	Item	Condition
5-1	Room Temperature & Humidity	20±15 °C / 65±20% RH
5-2	Test Chamber Temperature	Limits ±3 °C
5-3	Voltage	Limits ±0.15 V

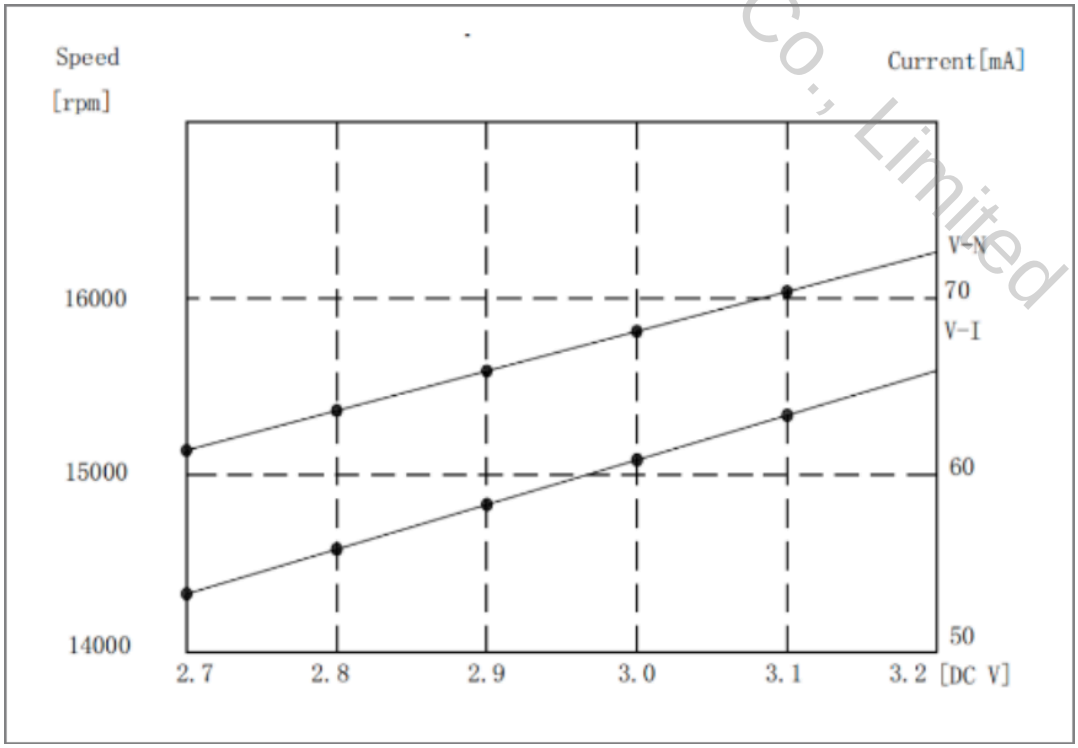
6. Electrical Characteristics

NO.	Item	Test Condition	Condition
6-1	Rated Voltage		DC 3.0V
6-2	Rotating Direction	[Red Wire (+), Black Wire(-)]	CW
6-3	Rated Load Speed	It is based on the standard measurement condition of the section 4.	14,000 ± 3,500 rpm
6-4	Rated Load Current	It is based on the standard measurement condition of the section 4.	90 mA max
6-5	Starting Current	It is based on the standard measurement condition of the section 4.	175 mA max
6-6	Starting Voltage	Motor On/Off test based on the standard measurement condition of the section 4-1, 4-2, and 4-4.	DC 2.5 V max
6-7	Insulation Voltage	Measured between terminal and case with DC 100V Megger.	/

7. Mechanical Characteristics

NO.	Item	Specification	Condition
7-1	Vibration Force	 - Motor shall be fixed on Jig by adhesive tape.	It is referred to the rated load speed of the section 7-3 (reference) (0.4 G MIN)
7-2	Mechanical Noise	 - Background Noise : 24dB MAX - Motor shall be fixed on Jig by adhesive tape.	50dB MAX
7-3	Weight	about 0.95g	

8. Characteristic Graph



9. Reliability Test

<table>
<tr><th>NO.</th><th>Item</th><th>Test Condition</th><th>Specification</th></tr>
<tr><td>9-1</td><td>Room Temperature & Humidity Life Test</td><td>
<table>
<tr><td>Item</td><td>Room Temp. & Humi. L/T</td></tr>
<tr><td>Voltage</td><td>DC 3.0V</td></tr>
<tr><td>Temperature</td><td>20±5℃</td></tr>
<tr><td>Humidity</td><td>65±15% RH</td></tr>
<tr><td>Life cycles</td><td>1,000,000 cycles</td></tr>
<tr><td>Duty Cycle</td><td>0.5 sec ON /0.5 sec OFF</td></tr>
</table>
Motor shall be fixed on Jig by adhesive tape.
(Refer to the section 4-4)
</td><td rowspan="6">Rated Load Speed: Initial value +40, -20%

Rated Load Current: Initial value±30%

The others: Conform to the section 7-6 and 7-7.</td></tr>
<tr><td>9-2</td><td>Low Temperature Storage Performance</td><td>Exposed to -40°C for 96 hours and then room temperature for 4 hours.</td></tr>
<tr><td>9-3</td><td>High Temperature Storage Performance</td><td>Exposed to +85°C for 96 hours and then room temperature for 4 hours.</td></tr>
<tr><td>9-4</td><td>High Temperature and Humidity Storage Performance</td><td>Exposed to +60°C, 95%RH for 96 hours and then room temperature for 4 hours.</td></tr>
<tr><td>9-5</td><td>Thermal Shock Test</td><td>Total 100cycles at -40°C and +85°C for 30 minutes each (1cycle=1 H)

Temperature Change Time< 5min

Motor shall be measured after exposure at room temperature for 4 hours.</td></tr>
<tr><td>9-6</td><td>Drop Test</td><td>Dummy set (about 150g) motor shall be dropped onto concrete plate. 3 times each side of 6 directions from a height of 150 cm, total 18 times.</td></tr>
</table>

NO.	Item	Test Condition	Specification
9-7	Vibration Test	Dummy set motor shall be subjected to sine wave of 10Hz~500Hz each of 2 hours. acceleration: 1.5mm or14.7m/s² Direction: x, y, z (each 15 minutes) Dummy set motor shall be subjected to sine wave of 33.2Hz each of 3 hours. acceleration: 43.2m/s² Direction: x, y, z (each 15 minutes)	Rated Load Speed: Initial value±30% Rated Load Current: Initial value ±30% The others: Conform to the section 7-6 and 7-7. No scar, rust, stain, or deformation by visual inspection.

10. Caution

NO.	Item	Specification
10-1	Operating Range	When using on the operating condition different from a standard, a problem can be generated to the performance and the life of a product.
10-2	Storage	Temperature 5~30°C, Humidity 60% Max.
10-3	Motor Handling	To handle the motor, hold the case softly. Do not bring a magnetized object or attracted object by the magnet of motor, or such object may deteriorate a performance of motor. At the time of power input short to the motor due to mis-operating, Drive IC of the motor inside can be damaged. To avoid this problem, please add capacitor of 2uF or more between the power line in parallel with the motor. Supplying voltage more than DC4.5V can make IC out of function.
10-4	Motor Usage	- Motor must be installed in device within 6 months of our ship date. For best reliability, it is recommended that the motor be exercised by powering it up for 3 seconds when the device is powered on.

11. Specification Change

Even when there is any change to this specification, change application report which has the information of details of the change, lot of product, and etc shall be presented to customer before that change being carried out. And mutual discussion may be necessary before the change being carried out.

Revision history shall be recorded on to the specification sheet when the change record and approval may be required.

12. Outline Drawing