# STEPPING MOTOR SPECIFICATION

**MOONS’ MODEL**
35PM048L6-00501 4611120001792

## 1. RATED CHARACTERISTICS AND CONDITIONS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>SPECIFICATION</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Rated Voltage</td>
<td>24 V DC</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Constant Current</td>
<td>0.63 A/Phase</td>
<td>Chopper Driver IC</td>
</tr>
<tr>
<td>1.3</td>
<td>Phase Number</td>
<td>Two (2)</td>
<td>Phases A&amp;B</td>
</tr>
<tr>
<td>1.4</td>
<td>Step Angle</td>
<td>7.5°</td>
<td>Full-Step</td>
</tr>
<tr>
<td>1.5</td>
<td>Excitation Method</td>
<td>Bipolar Full-Step</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Insulation Class</td>
<td>Class B</td>
<td></td>
</tr>
</tbody>
</table>

## 2. ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>SPECIFICATION</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Resistance per Phase</td>
<td>5.30 ± 10%</td>
<td>@ 25°C</td>
</tr>
<tr>
<td>2.2</td>
<td>Inductance per Phase A/B</td>
<td>9mH ±20%</td>
<td>1 kHz 1V rms</td>
</tr>
<tr>
<td>2.3</td>
<td>Holding Torque</td>
<td>620 gcm min.</td>
<td>Two-Phase On</td>
</tr>
<tr>
<td>2.4</td>
<td>Detent Torque</td>
<td>95 gcm max.</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Dynamic Pull-in Torque</td>
<td>430 gcm min.</td>
<td>300 pps Full-Step</td>
</tr>
<tr>
<td>2.6</td>
<td>Dynamic Pull-out Torque</td>
<td>380 gcm min.</td>
<td>800 pps Full-Step</td>
</tr>
<tr>
<td>2.7</td>
<td>Pull-in Pulse Rate</td>
<td>900 pps min.</td>
<td>No Load Full-Step</td>
</tr>
<tr>
<td>2.8</td>
<td>Step Angle Accuracy</td>
<td>7.5°± 7%</td>
<td>@1 pps Full-Step</td>
</tr>
<tr>
<td>2.9</td>
<td>Insulation Resistance</td>
<td>100 MO min.</td>
<td>Case-lead DC500V</td>
</tr>
<tr>
<td>2.10</td>
<td>Dielectric Strength</td>
<td>Leak Current 3mA max.</td>
<td>Case-lead AC600V 1 sec</td>
</tr>
<tr>
<td>2.11</td>
<td>Temperature Rise</td>
<td>80K max. Two phase on</td>
<td>On 105x105x2t Al Plate</td>
</tr>
<tr>
<td>2.12</td>
<td>Direction of Rotation</td>
<td>CW &amp; CCW</td>
<td>Seen from Flange Side</td>
</tr>
</tbody>
</table>

**REV** | **DESCRIPTION** | **DATE** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>FIRST ISSUED</td>
<td>2016.11.16</td>
</tr>
<tr>
<td>B</td>
<td>CHANGE WIRE ORDERS</td>
<td>2017.05.18</td>
</tr>
<tr>
<td>C</td>
<td>HOLDING TORQUE AND PULL-IN AND PULL-OUT TORQUE CHANGED</td>
<td>2017.06.30</td>
</tr>
<tr>
<td>D</td>
<td>Cover and P/N changed</td>
<td>2019.04.10</td>
</tr>
<tr>
<td>E</td>
<td>ELECTRICAL CHARACTERISTICS</td>
<td>2019.05.30</td>
</tr>
</tbody>
</table>
3. MECHANICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>SPECIFICATION</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Radial Shaft Loading</td>
<td>7.5N Max.</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Axial Shaft Loading</td>
<td>1N Max.</td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Radial Shaft Play</td>
<td>0.05 mm Max.</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Axial Shaft Play</td>
<td>0.6 mm Max.</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>Mass</td>
<td>Approximate 90g</td>
<td></td>
</tr>
<tr>
<td>3.6</td>
<td>Rotor Inertia</td>
<td>Approximate 4.65gcm²</td>
<td></td>
</tr>
</tbody>
</table>

4. OPERATING CONDITIONS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
<th>SPECIFICATION</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Operating Temperature</td>
<td>-20°C ~ +50°C</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Operating Humidity</td>
<td>15 ~ 85% RH</td>
<td>No Condensation</td>
</tr>
<tr>
<td>4.3</td>
<td>Storage Temperature</td>
<td>-30°C ~ +70°C</td>
<td></td>
</tr>
<tr>
<td>4.4</td>
<td>Storage Humidity</td>
<td>15 ~ 85% RH</td>
<td>No Condensation</td>
</tr>
</tbody>
</table>

5. RELIABILITY AND WARRANTY

<table>
<thead>
<tr>
<th>NO.</th>
<th>SPECIFICATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>3,000 Hours min.</td>
<td>1. Normal Operating Conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Full-Step @600RPM, Rated voltage, Rated current and load</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. No Unusual Vibration &amp; Noise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Satisfactory Electrical &amp; Mechanical Characteristics</td>
</tr>
<tr>
<td>5.2</td>
<td>Satisfactory Electrical &amp; Mechanical Characteristics</td>
<td>1. Vibration Test at Motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. 0 ~ 100 Hz Sweep for 5 Minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. 1.5 mm, 3 Directional Amplitude for 30 Minutes</td>
</tr>
<tr>
<td>5.3</td>
<td>Satisfactory Electrical &amp; Mechanical Characteristics</td>
<td>1. Shock Test at Package</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. 30 G, 3 Directions each for 1 time</td>
</tr>
</tbody>
</table>

6. REMARKS

6.1 An abnormal operation may extremely shorten the performance or service life.
6.2 Do not hold the motor by lead wire or PCB.
6.3 The motor is subject to change for improving the performance within the range satisfying its specification.
**CONNECTOR PIN LOCATION**

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>COLOR</th>
<th>CCW (SEEN FROM FLANGE SIDE)</th>
<th>CW</th>
<th>PHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BLACK</td>
<td>ON</td>
<td>ON</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>BROWN</td>
<td>ON</td>
<td>ON</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>ORANGE</td>
<td>ON</td>
<td>ON</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>YELLOW</td>
<td>ON</td>
<td>ON</td>
<td>B</td>
</tr>
</tbody>
</table>

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**Remarks**

- **Electrical characteristics changed**
  - First angle method
  - Tolerances for linear and angular dimensions without individual tolerance indications
  - Geometrical tolerances for features without individual tolerance indications

- **Cover and P/N changed**
  - Tolerances for linear and angular dimensions without individual tolerance indications
  - Geometrical tolerances for features without individual tolerance indications

- **Holding torque and detent torque and pull-in and pull-out torque**
  - Tolerances for linear and angular dimensions without individual tolerance indications
  - Geometrical tolerances for features without individual tolerance indications

- **Wire changed**
  - Tolerances for linear and angular dimensions without individual tolerance indications
  - Geometrical tolerances for features without individual tolerance indications

- **Original revision**
  - Tolerances for linear and angular dimensions without individual tolerance indications
  - Geometrical tolerances for features without individual tolerance indications

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Approval</th>
<th>Standard</th>
<th>Technology</th>
<th>Check</th>
<th>Design</th>
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<tbody>
<tr>
<td>19.05.30</td>
<td>35FM048L6-00501</td>
<td></td>
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