

# 产品规格说明书

## PRODUCT SPECIFICATION

|                |                                     |  |
|----------------|-------------------------------------|--|
| FILED BY BUYER | 客户名称<br>Buyer Name                  |  |
|                | 客户料号<br>Buyer Part No.              |  |
|                | 客户承认签章<br>Buyer Approved Signatures |  |

|                 |                                  |                                     |                   |
|-----------------|----------------------------------|-------------------------------------|-------------------|
| FILED BY LEADER | 文件编号<br>Spec No.                 | leader-3134                         |                   |
|                 | 品名<br>Part Name                  | 扁平振动马达<br>Coin Type Vibration Motor |                   |
|                 | 型号<br>Model No.                  | LCM0720A3134F                       |                   |
|                 | 样品提交日期<br>Date Samples Submitted |                                     |                   |
|                 | 作成 Designed by                   | 检讨 Checked by                       | 承认 Approved by    |
|                 | 张婷婷<br>2021.02.26                | 张冠军<br>2021.02.26                   | 王运东<br>2021.02.26 |

立得微电子（惠州）有限公司

Leader Micro Electronics (Huizhou) Co., Ltd.

Tiger Industrial Park, Baigang, Xiaojinkou, Huizhui, Guangdong 516000, China

Tel: +86-752-5853255, Fax: +86-752-5839222, Website: www. leader-cn.cn

生产地址：中国广东省惠州市小金口老虎岭工业园，邮政编码：516000

# 规格书内容

## Contents of Specifications

|  |           |
|--|-----------|
| 1. 适用范围/ Applicable Scope                      | 1/10      |
| 2. 使用条件/ Operating Conditions                  | 1/10      |
| 3. 测试条件/ Test Conditions                       | 1/10      |
| 4. 初期电气性能/ Initial Electrical Characteristics  | 1/10      |
| 5. 机械性能/ Mechanical Characteristics            | 2/10      |
| 6. 耐久性能/ Reliability Characteristics           | 2/10-4/10 |
| 7. 标准测量方法/ Standard Measuring Method           | 5/10      |
| 8. 测量方法及回路图/ Measuring Method & Circuit Map    | 5/10      |
| 9. 使用注意事项/ Cautions in Use                     | 6/10      |
| 10. 特性曲线图/ Characteristics Graph               | 6/10      |
| 11. 环境管理物质/ Environmental Management Materials | 7/10      |
| 12. 包装/ Packaging                              | 8/10      |
| 13. 外形图/ Mechanical Drawing                    | 9/10      |
| 14. 更改记录/ Revision Records                     | 10/10     |

## 1. 适用范围/ Applicable Scope

本说明书适用于扁平式永磁直流电机LCM0720A系列。

This specification applies to Coin Motor DC model LCM0720A series.

## 2. 使用条件/ Operating Conditions

| 项目/Item |                               | 规格/Specification                        |
|---------|-------------------------------|---|
| 2-1     | 额定电压<br>Rated voltage         | 3.0V DC                                 |
| 2-2     | 使用电压范围<br>Operating voltage   | 2.7~3.3V DC                             |
| 2-3     | 旋转方向<br>Rotation              | CW(clockwise) or CCW(counter clockwise) |
| 2-4     | 使用环境<br>Operating environment | -20~+60°C, 65±20%RH                     |
| 2-5     | 保存环境<br>Storage environment   | -30~+70°C, 65±20%RH                     |

## 3. 测定条件/ Testing Conditions

| 项目/Item |                    | 规格/Specification              |
|---------|--------------------|-------------------------------|
| 3-1     | 温度<br>Temperature  | 25±3°C                        |
| 3-2     | 湿度<br>Humidity     | 65±2% RH                      |
| 3-3     | 气压<br>Air Pressure | 1013±40 hPa                   |
| 3-4     | 电源<br>Power        | 稳压直流电流<br>Constant DC Current |

## 4. 初期电气性能/ Initial Electrical Characteristics

| 项目/Item |                               | 规格/Specification             | 条件/Condition  |
|---------|-------------------------------|------------------------------|---|
| 4-1     | 额定转速<br>Rated Speed           | 9000 Min rpm                 | 额定电压下和额定负载下。<br>At rated voltage and rated load.            |
| 4-2     | 额定电流<br>Rated Current         | ≤85mA                        |   |
| 4-3     | 起动电流<br>Starting Current      | ≤120mA                       | 在最小起动电压下起动<br>Motor is rotating at min starting voltage.    |
| 4-4     | 起动电压<br>Starting Voltage      | ≤2.5V DC                     |   |
| 4-5     | 绝缘电阻<br>Insulation Resistance | ≥10MΩ                        | 在100V直流下，导线和机壳间测量<br>At DC 100V between lead wire and case. |
| 4-6     | 端子阻抗<br>Terminal Resistance   | 35Ω±15% (单相)<br>70Ω±15% (串联) | 在25°C下<br>At 25°C   |

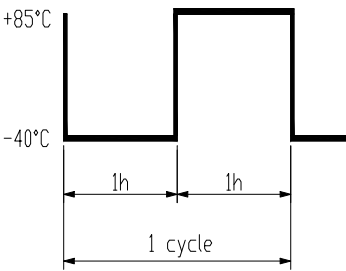
## 5. 机械性能/ Mechanical Characteristics

| 项目/Item |  | 规格/Specification         |
|---------|--|--------------------------|
| 5-1     | 底盖偏转强度<br>Bracket deflection strength  | 9.8N以上<br>≥9.8N          |
| 5-2     | 机械噪音<br>Mechanical noise   | 小于50分贝. A计权<br>≤50dB (A) |
|         | <p>在额定电压下。<br/>背景噪音：不大于28dB.A计权<br/>电机轴向水平固定在约100g测试夹具上，<br/>拾音器沿轴向正对电机平面。<br/>测试距离100mm</p> <p>At rated voltage and scene noise as<br/>28dB (A)Max,<br/>the shaft is horizontally fastened to<br/>the test jig (100g).<br/>The Microphone faces the plane of<br/>motor along The shaft .<br/>The distance is 100mm.</p> |                          |
| 5-3     | Vibration Test<br>振动测定   | <p>0.8G (AVG)</p>        |

## 6. 耐久性能/ Reliability Characteristics

| 项目/Item           | 规格/Specification                       | 判定标准/Judgment  |
|-------------------|--|--|
| 6-1<br>寿命<br>Life | <p>试验循环 /Test cycle: 35,000 cycles</p> | <p>在常温常湿下放置4h后，电机性能应符合以下要求。</p> <ol style="list-style-type: none"> <li>1)额定转速:指标不低于初始值-30%；不高于初始值+50%</li> <li>2)额定电流:指标在初始值±30%以内。</li> <li>3)起动电压:2.5V DC Max直流电压。</li> </ol> <p>After 4h exposure in the ordinary temperature and humidity,the motor's performance should accord with below requirements:</p> <ol style="list-style-type: none"> <li>1)Rated speed:Data-30% Initial Min, Data+50% Initial Max.</li> <li>2)Rated current:Data±30% Max.</li> <li>3)Starting voltage: 2.5V DC Max</li> </ol> |

| 项目/Item |                                   | 规格/Specification  | 判定标准/Judgment  |
|---------|-----------------------------------|---|--|
| 6-2     | 低温放置<br>Low Temperature Exposure  | 温度 /Temperature: $-20 \pm 2^{\circ}\text{C}$<br>时间 /Time: 96h   | <p>在常温常湿下放置4h后, 电机性能应符合以下要求。</p> <p>1)额定转速:指标在初始值<math>\pm 30\%</math>以内。<br/>2)额定电流:指标在初始值<math>\pm 30\%</math>以内。<br/>3)起动电压:2.5V DC Max.</p> <p>After 4h exposure in the ordinary temperature and humidity, change rates of the motor's performance should accord with below requirements:</p> <p>1)Rated speed: within <math>\pm 30\%</math> of initial value.<br/>2)Rated current: within <math>\pm 30\%</math> of initial value.<br/>3)Starting voltage: 2.5V DC Max</p> |
| 6-3     | 高温放置<br>High Temperature Exposure | 温度 /Temperature: $+ 70 \pm 2^{\circ}\text{C}$<br>时间 /Time: 96h  |  |
| 6-4     | 湿度放置<br>Humidity Exposure         | 温度 /Temperature : $+ 40 \pm 2^{\circ}\text{C}$<br>湿度 /Humidity: 90 ~ 95%RH<br>放置时间 / Exposure time : 96h<br>无水气凝结 /No condensation of moisture  |  |
| 6-5     | 振动<br>Vibration                   | 频率 /Frequency: 10~55Hz<br>加速度 /Acceleration: 22m/s <sup>2</sup><br>周期 /Period: 10 Minutes log sweep (1.0G), (10~55~10Hz)<br>条件 /Condition: This motion shall be applied for a period of 10 minutes in direction of X, Y, Z.   | <p>在常温常湿下放置4h后, 电机性能应符合以下要求。</p> <p>1)额定转速:指标在初始值<math>\pm 30\%</math>以内。<br/>2)额定电流:指标在初始值<math>\pm 30\%</math>以内。<br/>3)起动电压:2.5V DC Max.</p> <p>After 4h exposure in the ordinary temperature and humidity, change rates of the motor's performance should accord with below requirements:</p> <p>1)Rated speed: within <math>\pm 30\%</math> of initial value.<br/>2)Rated current: within <math>\pm 30\%</math> of initial value.<br/>3)Starting voltage: 2.5V DC Max</p> |
| 6-6     | 自然跌落<br>Free fall                 | 试验状态: 将马达固定在约50克(包括马达本身)的物体上, 落向水泥地面。<br>Test state: Set the motor to a block of an approx. 100g weight (including the motor) and drop it onto the concrete floor.<br>Height: 1.2m<br>Direction : $\pm x, \pm y, \pm z$<br>Number of times: 3 times each direction<br>Shock: 29420m/s <sup>2</sup> equivalent to 3000G. | <p>在常温常湿下放置4h后, 电机性能应符合以下要求。</p> <p>1)额定转速:指标在初始值<math>\pm 30\%</math>以内。<br/>2)额定电流:指标在初始值<math>\pm 30\%</math>以内。<br/>3)起动电压:2.5V DC Max.</p> <p>After 4h exposure in the ordinary temperature and humidity, change rates of the motor's performance should accord with below requirements:</p> <p>1)Rated speed: within <math>\pm 30\%</math> of initial value.<br/>2)Rated current: within <math>\pm 30\%</math> of initial value.<br/>3)Starting voltage: 2.5V DC Max</p> |

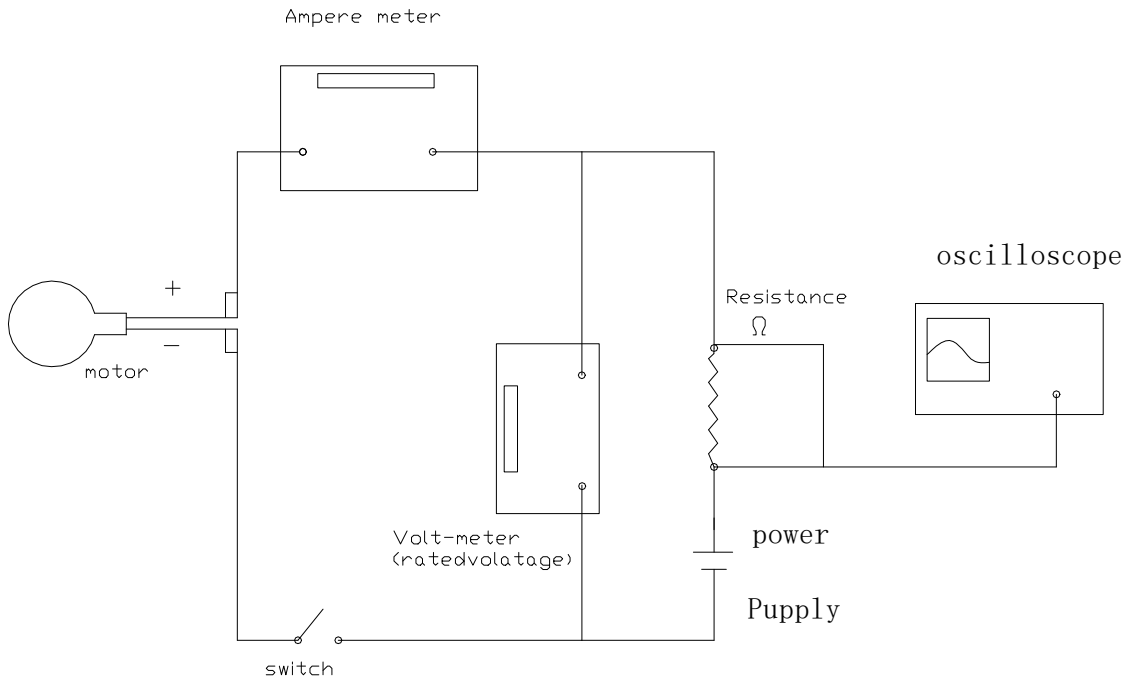
| 项目/Item |                          | 规格/Specification   | 判定基准 / Requirements   |
|---------|--------------------------|--|---|
| 6-7     | 滚筒试验<br>Barrel roll test | 滚筒高度: 1.0M<br>滚筒次数: 300次.<br>滚筒速率: 13±1次/分钟<br><br>Height: 1.0M<br>Times: 300 times.<br>Speed: 13±1 times/Minute       | 在常温常湿下放置4h后, 电机性能应符合以下要求。<br>1)额定转速:指标在初始值±30%以内。<br>2)额定电流:指标在初始值±30%以内。<br>3)起动电压:2.5V DC Max.<br>After 4h exposure in the ordinary temperature and humidity, change rates of the motor's performance should accord with below requirements:<br>1)Rated speed: within ±30% of initial value.<br>2)Rated current: within ±30% of initial value.<br>3)Starting voltage: 2.5V DC Max |
| 6-8     | 热冲击<br>Heat stock test   |  <p>试验循环 /Test cycle: 15 cycles</p> | 在常温常湿下放置4h后, 电机性能应符合以下要求。<br>1)额定转速:指标在初始值±30%以内。<br>2)额定电流:指标在初始值±30%以内。<br>3)起动电压:2.5V DC Max.<br>After 4h exposure in the ordinary temperature and humidity, change rates of the motor's performance should accord with below requirements:<br>1)Rated speed: within ±30% of initial value.<br>2)Rated current: within ±30% of initial value.<br>3)Starting voltage: 2.5V DC Max |

### 7. 标准测量方法/ Standard Measuring Method



- 振动量测试仪  
Vibration meter
- 马达安放装置  
Test Jig (for  
Clamping  
the Motor in Place)
- 马达综合测试仪  
Multi-functional  
Test Mete
- 波形脉冲显示  
Oscilloscope
- 噪音测试仪  
Noise Test Meter

### 8. 测量方法及回路图/ Measuring Method & Circuit Map



## 9. 使用时注意事项/ Caution in Use

9-1 必须按照规格书标准使用,否则性能和寿命都将受到相当减少, 必须注意电压的使用范围./ The performance and lifetime would be considerably reduced if the operation is not done as per the specification defines. Do pay attention to the range of operating voltage in use.

9-2 建议马达在六个月内使用,不要在以下环境中使用及保存:

- 高温和高湿的场所;
- 腐蚀性气体,如:  $H_2S$ 、 $SO_2$ 、 $NO_2$ 、 $Cl_2$ ;
- 生锈场所。

It is suggested to use the motors within 6 months as possible as you can.

It is not suggested to use or store the motors under the following conditions:

- High temperature and high humidity area.
- Corrosive gas environment, such as  $H_2S$ ,  $SO_2$ ,  $NO_2$ ,  $Cl_2$  etc.
- Dusty areas.

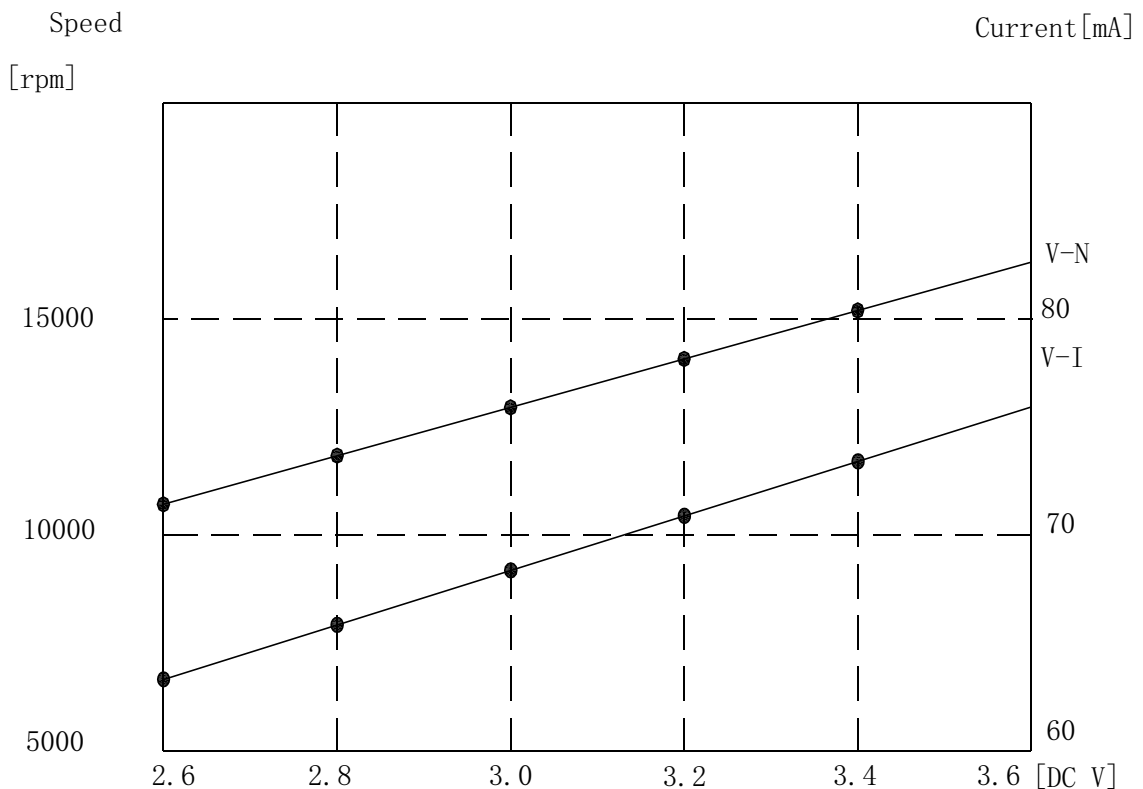
9-3 注意处理马达的工作环境, 避免含铁质物体被马达吸住, 否则马达将会产生噪声, 性能会降低, 从而减少产品可靠性。/ Keep clean the working environments to avoid the objects such as iron powder etc are attracted by the magnet. Otherwise, it would cause noise, function deterioration and lower reliability.

9-4 应确信本产品不会与相关标准、法律、政令相背。/ Be sure not to disobey the local laws and rules.

9-5 拿马达时, 要轻拿轻放。/ The motors should be taken up and placed gently in operation.

9-6 钢板面或边缘有少许锈斑是允许的。/ Slight rust on the edge of the steel housing is permitted.

## 10. 特性曲线图/Characteristics Graph





## 11. 环境管理物质/ Environmental Management Materials:

11.1 本产品应符合RoHS 指令要求和无卤素要求。

The product should be in compliance with RoHS/ REACH requirements:

\* 镉及其化合物最大允许含量为100PPM

Cadmium and Compound:  $\leq 100\text{PPM}$

\* 铅及其化合物最大允许含量为1000PPM

Lead and Compound:  $\leq 1000\text{PPM}$

\* 汞及其化合物最大允许含量为1000PPM

Hydrargyrum and Compound:  $\leq 1000\text{PPM}$

\* 六价铬及其化合物最大允许含量为1000PPM

+6 Chromium and Compound:  $\leq 1000\text{PPM}$

\* 多溴联苯及其化合物最大允许含量为1000PPM

PBB and Compound:  $\leq 1000\text{PPM}$

\* 多溴二苯醚及其化合物最大允许含量为1000PPM

PBDE and Compound:  $\leq 1000\text{PPM}$

\* 氯溴两种卤素之和最大允许含量为1500PPM

The allowed content of Cl and Br is 1500PPM Max for total.

\* 氯卤素最大允许含量为900PPM

The allowed content of Cl is 900PPM Max.

\* 溴卤素最大允许含量为900PPM

The allowed content of Br is 900PPM Max.

11.2 本品所含有以下物质是RoHS指令豁免项

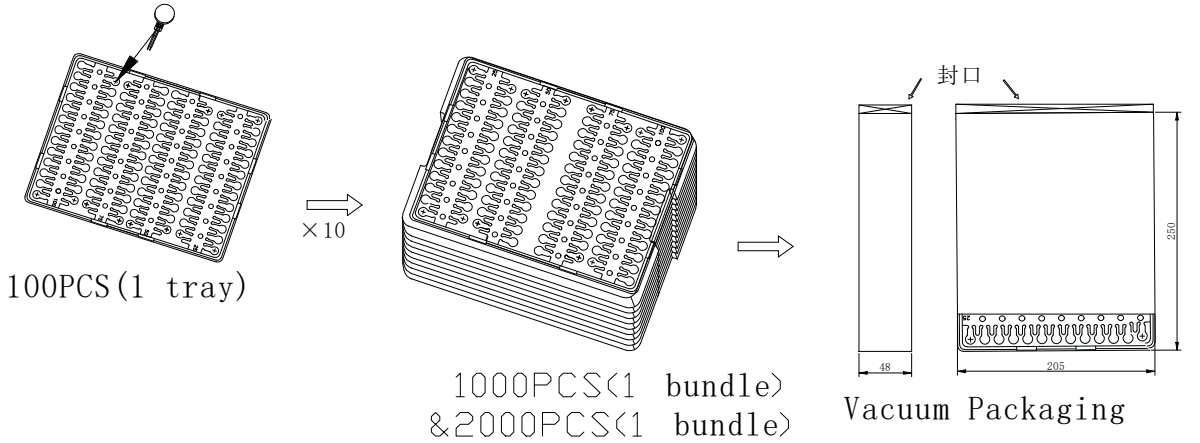
The below substance contained in the motor is exempted from RoHS directives:

| 序号<br>NO. | 品名<br>Part Name       | 材质<br>Material      | 含有材质<br>Harzadaous<br>Substance | 允许容量<br>Limited Content | 部品重量<br>Weight of<br>Part |
|-----------|-----------------------|---------------------|---------------------------------|-------------------------|---------------------------|
| #1        | 含油轴承<br>Oiled Bearing | 铜合金<br>Copper Alloy | 铅<br>Pb                         | $\leq 4\%$              | $\approx 0.03\text{g}$    |

## 12. 包装/ Packaging:

### 振动马达包装

### Pack drawing of Vibrator Motor

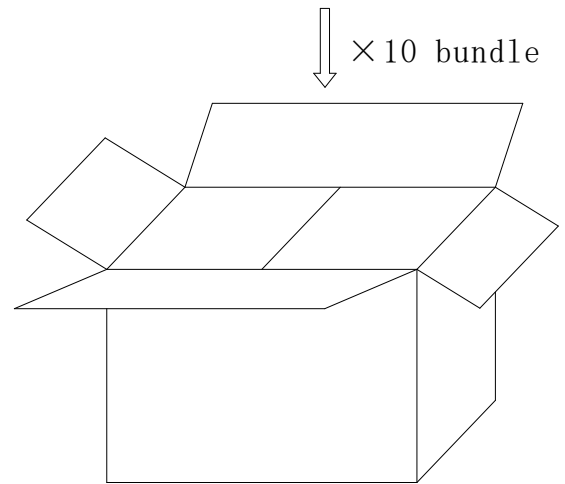


包装尺寸/Packaging Size:

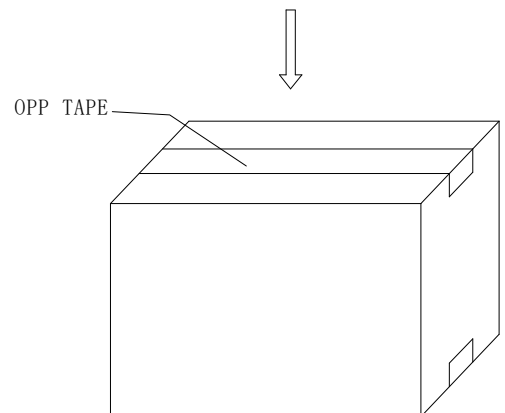
10000PCS/CARTON:  
CARTON SIZE: 430mm\*270mm\*220mm

包装试验要求:

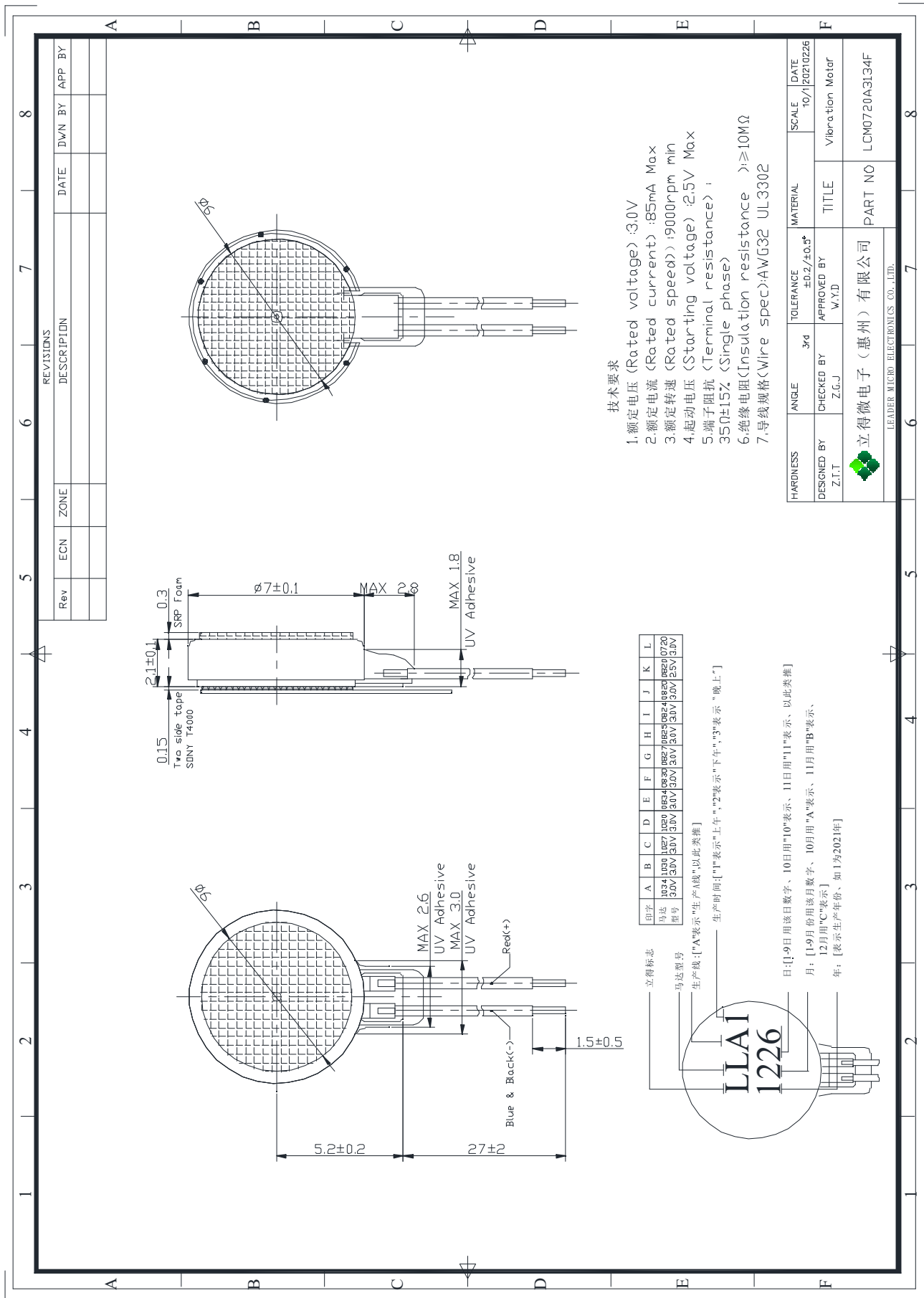
Packaging test requirements:  
沿外包装箱  $\pm x$ ,  $\pm y$  和  $\pm z$  方向, 距水泥地面 1.5m 高度, 各自由跌落 2 次, 马达应无机械损伤, 电气性能仍符合标准要求。  
Along the outer packing box + X, + y and + Z direction, from the cement ground 1.5m height, the free fall 2 times, the motor should have no mechanical damage, electrical performance is still in line with the standard requirements.



10000PCS/ CARTON



13. 外形图/ Mechanical Drawing:



| REVISONS |     | DATE | DVN BY | APP BY |
|----------|-----|------|--------|--------|
| Rev      | ECN | ZONE |        |        |
|          |     |      |        |        |
|          |     |      |        |        |

- 技术要求
1. 额定电压 (Rated voltage): 3.0V
  2. 额定电流 (Rated current): 85mA Max
  3. 额定转速 (Rated speed): 9000rpm min
  4. 启动电压 (Starting voltage): 2.5V Max
  5. 端子阻抗 (Terminal resistance):  $35\Omega \pm 15\%$  (Single phase)
  6. 绝缘电阻 (Insulation resistance):  $> \geq 10M\Omega$
  7. 导线规格 (Wire spec): AWG32 UL3302

| 印字 | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    |
|----|------|------|------|------|------|------|------|------|------|------|------|------|
| 马达 | 1024 | 1030 | 1027 | 1030 | 0954 | 0930 | 0927 | 0925 | 0924 | 0923 | 0922 | 0920 |
| 型号 | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 3.0V | 2.5V |

立得标志  
马达型号  
生产时间: ["A"表示"上午", "2"表示"下午", "3"表示"晚上"]

生产时间: ["A"表示"上午", "2"表示"下午", "3"表示"晚上"]

日: [1-9] 用该日数字, 10日用"10"表示, 11日用"11"表示, 以此类推]  
月: [1-9] 月份用该月数字, 10日用"A"表示, 11日用"B"表示, 12日用"C"表示]  
年: [表示生产年份, 如1为2021年]

| HARDNESS             | ANGLE                | TOLERANCE           | MATERIAL | SCALE           | DATE  |
|----------------------|----------------------|---------------------|----------|-----------------|-------|
| DESIGNED BY<br>Z.I.T | CHECKED BY<br>Z.G.J  | $\pm 0.2/\pm 0.3^*$ |          | 10/1/2021       | 20226 |
|                      | APPROVED BY<br>W.Y.D |                     | TITLE    | Vibration Motor |       |
|                      |                      |                     | PART NO  | LCM0720A3134F   |       |

立得微电子 (惠州) 有限公司  
LEADER MICRO ELECTRONICS CO., LTD.

|                   |                   |                     |       |
|-------------------|-------------------|---------------------|-------|
| 2021.02.26(REV,0) | 说明书/Specification | 编号/No.: leader-3134 | 10/10 |
|-------------------|-------------------|---------------------|-------|

#### 14. 更改记录/ Revision Records:

|                          |               |                 |                     |
|--------------------------|---------------|-----------------|---------------------|
| CUSTOMER<br>顾客           |               | SPEC NO<br>规格书号 | 编号/No.: leader-3134 |
| PRODUCT<br>MODEL<br>产品型号 | LCM0720A3134F | DATE<br>日期      | 2021.02.26          |

### REVISION RECORDS 修改记录表

| REV NO<br>修改号 | DATE<br>日期 | PAGE<br>页码 | REVISION ITEM<br>修改项目 | REASON<br>更改原因 |
|---------------|------------|------------|-----------------------|----------------|
| REV,0         | 2021.02.26 | /          | 产品发布                  |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |
|               |            |            |                       |                |