

产品规格说明书

PRODUCT SPECIFICATION

FILLED BY BUYER	客户名称 Buyer Name	
	客户料号 Buyer Part No.	
	客户承认签章 Buyer Approved Signatures	

FILLED BY LEADER	文件编号 Spec No.	leader-A609F	
	品名 Part Name	声波电机 Sonic Motor	
	型号 Model No.	LDSM1538-A609F	
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	张亭亭 2024.03.07	张冠军 2024.03.07	王远东 2024.03.07

立得微电子（惠州）有限公司

Leader Micro Electronics (Huizhou) Co., Ltd.

Tiger Industrial Park, Xiaojinkou, Huizhou, 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

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1. 适用范围/ Applicable Scope

本说明书适用于声波电机LDSM1538A系列.
This specification applies to Coin Motor DC model LDSM1538A series.

2. 使用条件/ Operating Conditions

序号/NO.	项目/Item	规格/Specification
2-1	额定电压 Rated voltage	3.6V AC
2-2	使用电压范围 Operating voltage	3.0~4.5 AC
2-3	使用频率范围 Operaing frequency	170~350Hz
2-4	空载频率 No load frequency	380Hz（Type/代表值）
2-5	额定负载 Rated load	4.5g(牙刷头掉重)
2-6	使用姿势/Moter Position	全方向/Any positions
2-7	外观 Appearance	无缺损、生锈、污损或变形 No scar, rust, stain or dent

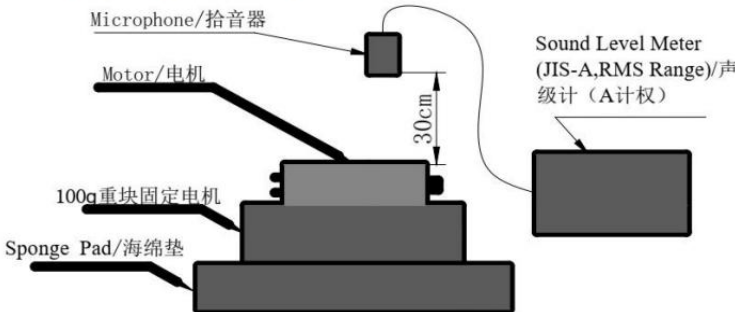
3. 测定条件/ Testing Conditions

序号/NO.	项目/Item	规格/Specification
3-1	测定条件 Measuring condition	在常温常湿下测试,若对结果有任何异议,均 $20\pm3^{\circ}\text{C}$, 相对湿度 $60\pm5\%$ 环境下的测试数据为准 Normal temperature and humidity if there is any doubt about judgment , measurements shall be made within $20\pm3^{\circ}\text{C}$ $60\pm5\%\text{RH}$
3-2	使用温度/湿度范围 Temperature Humi dity Range	1.工作环境温度/Working temperature: $-10^{\circ}\text{C}\sim60^{\circ}\text{C}$ 湿度/Humidity: $\leq90\%\text{RH}$ 2.保存温度/Storage temperature: $-30^{\circ}\text{C}\sim70^{\circ}\text{C}$ 湿度/Humidty: $\leq80\%\text{RH}$

4. 初期电气性能/ Initial Electrical Characteristics

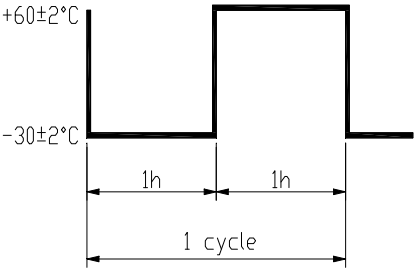
序号 NO.	项目/Item	规格 Specification	代表值 Type	条件/Condition
4-1	额定电压 Rated voltage	3.6V AC		
4-2	额定频率 Rated frequency	260Hz	260Hz	额定电压、额定负荷、额定频率、45%占空比相对于半周期，负载带牙刷头上带 200g 砝码。 At rated voltage and rated load and rated frequency and 45%Duty cycle relative to half cycle. The load is a toothbrush head with 200g weight
4-3	额定电流 Rated current	300 mA ±20%	300mA	
4-4	空载电流 (380Hz) NO load current	200mA Max	120mA	额定电压、无负荷、额定频率、45%占空比相对于半周期 At rated voltage and NO load and rated frequency and 45%Duty cycle relative to half cycle.
4-5	堵转电流 Stall current	720mA ±20%	720mA	额定电压，直接连接交流电源，不带驱动 PCB At rated voltage 3.6V AC, no driving PCB
4-6	启动电压 Starting vltage	3.0V AC Min		
4-7	绝缘电阻 Insulation resistance	10MΩ Min		直流电压 100V，测电机端子与 机壳间绝缘阻抗At 100V DC between motor terminal and case
4-8	力矩 Torque	270gf.cm min	280gf.cm	At rated voltage 额定电压、平衡位置的扭力 额定电压 3.6V AC、平衡位置的扭力
4-9	扭矩/Torque	0		额定电压、额定负荷、额定频率、45%占空比相对半周期 At rated voltage and rated load and rated frequency and 45%Duty cycle relative to half cycle.
4-10	角度/Angle	4.5°min		
4-11	轴扁位的偏角	0 ± 7.0°		电机壳平面的中心法线为基准 0 位，轴扁位法线与基准 0 位的夹角 The angle between Vertical line of casing flat and Vertical line of shaft flat

5. 机械特性/ Mechanical characteristics

序号/NO.	项目/Item	规格/Specification	
5-1	主轴最大承受力 Shaft press fit foree	≤8Kgf	
5-2	质量 Mass	23g±2g	
5-3	瞬间容许最大扭力 Max Transient Torque	≤5Kgf.cm	
5-4	机械噪音 Mechanical Noise	45dB(A)Max	42dB(A)
		额定电压、空载 At rated voltage and No-load 背景噪音/Back ground noise: 30dB(A)MAX  Microphone/拾音器 Motor/电机 100g重块固定电机 Sponge Pad/海绵垫 Sound Level Meter (JIS-A,RMS Range)/声级计 (A计权)	

6. 耐久性能/ Reliability Characteristics

项目/Item		规格/Specification	判定标准/Judgment
6-1	寿命 Life	电压/Voltage: 3.6V AC 额定负荷/Rated Load 环境条件/Environment: 常温、常湿/Normal temperature and humidity 260Hz 45%占空比 Duty cycle relative to half cycle, ON 120s,OFF 30s,1000H。	试验后，马达能满足7-1 的规定 After the test ,motors shall beapproved as specified initem 7-1

项目/Item		规格/Specification	判定标准/Judgment
6-2	低温放置 Low Temperature Exposure	温度 /Temperature: $-30\pm 2^{\circ}\text{C}$ 时间 /Time: 24hours	常温常湿条件下放置4小时后，马达满足7-2的规定 After 4hours exposure in ordinary temperature and humidity, motors shall be approved as specified in item 7-2
6-3	高温放置 High Temperature Exposure	温度 /Temperature: $+70\pm 2^{\circ}\text{C}$ 时间 /Time: 24hours	
6-4	湿度放置 Humidity Exposure	温度 /Temperature : $+40\pm 2^{\circ}\text{C}$ 湿度 /Humidity: 90 ~ 95%RH 放置时间 / Exposure time : 48hours 无水气凝结 /No condensation of moisture	
6-5	自然跌落 Free fall	高度/Height: 75cm 方向/Direction : $\pm x, \pm y, \pm z$ 次数/Number of times: 6 times each direction 将产品在包装OK状态距混泥土地面高75cm处自然落下，6个面各跌落一次，共6次。 Set the motors in the carton : Drop the motors with carton on the concrete floor from 75cm in height. Drop once in each of the six perpendicular planes, totally 6 times.	试验终止后，马达能满足 7-1 项的判定基准 After the test, motors shall be approved as specified in item 7-1
6-6	热冲击 Heat shock test	 Test cycle/试验循环周期数: 25cycles	常温常湿条件下放置 4 小时后，马达 满足 7-3 的规定 After 4hours exposure in ordinary temperature and humidity, motors shall be approved as specified in item 7-3

6-7	盐雾试验 Salt spray test	浓度/Concentration: 5% NaCl溶液 / 5% NaCl PH值/PH value: 6.5~7.2 试验槽温度/Test chamber temperature: 35±2°C 盐雾沉降量/Salt spray deposition: 1--2ml/80cm2*h 试验时间/Time: 8H (Shaft /电机轴 96H)	试验后恢复 2h, 马达外壳不可出现不可擦拭的锈迹 After 2 hours exposure in ordinary temperature and humidity,non-wipe-able rust on the case isnot allowed
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7.判定基准/Requirements

7-1	TABLE A	1) Rated speed/额定转速: Initial data/初始值±50%Max 2) Rated current/额定电流: Initial data/初始值±50%Max 3) Insulation resistance/绝缘阻抗: 1 MΩ Min 4) Starting voltage/起动电压: 3.5V AC Max
7-2	TABLE B	1)Rated speed/额定转速: Initial data/初始值±30%Max 2)Rated current/额定电流: Initial data/初始值±30%Max
7-3	TABLE C	1)Rated speed/额定转速: Initial data/初始值±35%Max 2)Rated current/额定电流: Initial data/初始值±35%Max

8.驱动方式/Drive way

如下图，正反两个方向交替供电，供电频率控制 170Hz~350Hz 的范围内，可按照实际需求控制占空比大小As shown in the figure below, the forward and reverse directions are alternately powered. The power supply frequency is controlled within the range of 170Hz~350Hz, and the duty cycle can be controlled according to the actual demand.



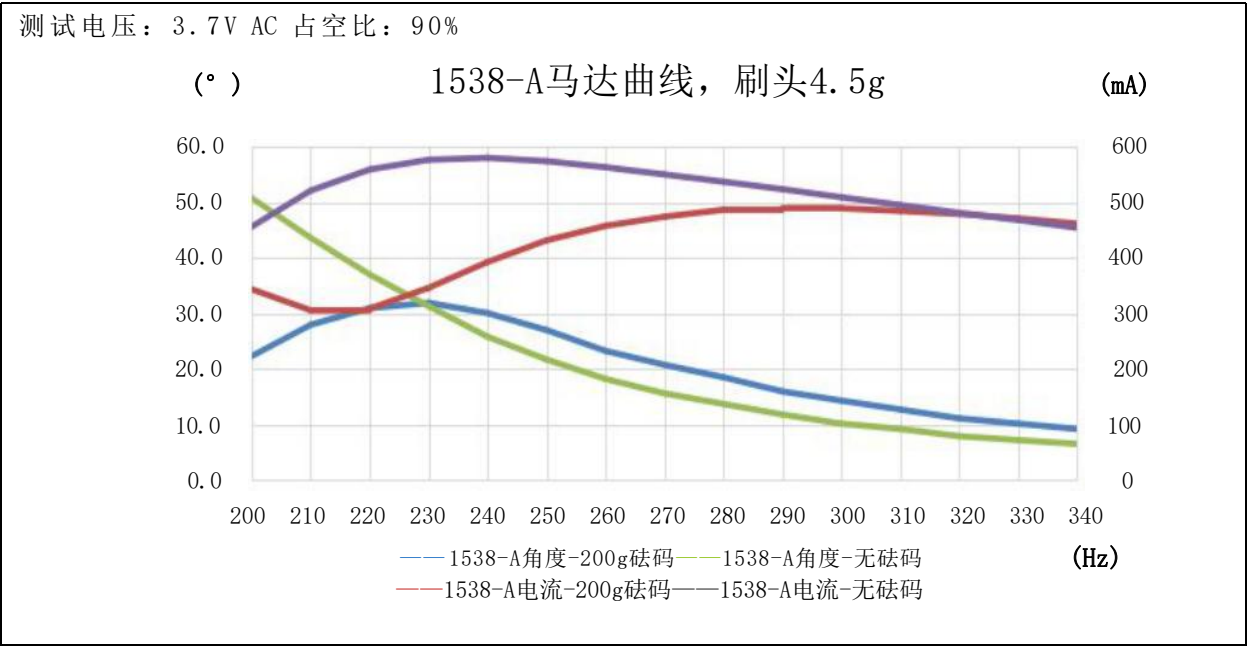
注意:

1、因为电机做的是左右摆动运动，正反两个方向的通电时长需调节成一致，这样会有最佳的振动力及振幅。

Because the motor is swinging from side to side, the power-on duration of the positive and negative directions should be adjusted to be consistent, so as to have the best vibration force and amplitude.

2、不能在电机上供直流电压，这时电机可能会工作在堵转状态，会持续发热，且不会动作。即当不需要电机振动时，电机两端的供电应完全切断。

The DC voltage cannot be supplied to the motor. At this time, the motor will work in a locked-rotor state, continue to heat up, and will not operate. That is, when the motor vibration is not required, the power supply at both ends of the motor should be completely cut off.



9.注意事项/ Caution in Use

9-1 工作范围/ Allowable range for use

注意电压及电流的使用范围，并且在本标准规定情况下使用马达，否则将相应降低马达的使用寿命和性能。

Pay attention to voltage and current ranges for use and use the vibration motor in the condition accordance with this specification, or the life and performance should be considerably receded.

9-2 移动电机/ Move your motor

拿电机时，应轻拿轻放，应尽可能的利用外壳部分。请勿将其跌落,否则会引起电机的外部形态和电气特性的改变。电机在运输过程中应小心轻放，避免严重碰撞敲击引起的电机机身和性能受损。

Please deal with the motors gently; you should make use of the outer case as possible as you can. Do not press the product, in case cause the transformation of performance or external appearance.Please lay the motors carefully during transportation to avoid any serious damage to the motor body or its electric function because of collision.



9-3 储存/Storage

9-3-1 避免储存在高温、低温、潮湿的环境中，连续存放不应超过 6 个月。

Avoids storing in high temperature、low temperature、high humidity environment, Not to be stored without running for more than 6 months.

9-3-2 马达储存和运转环境中均不可存在腐蚀性气体。

例如：H2S、SO2、NO2、CL2 等。另外存储环境中不可有诸如硅、氰、甲醛水和苯酚等能放射出腐蚀性气体的物质，否则，会引起马达不运转。

Storage and operating environment must not contain corrosive gases. For example, H2S. SO2. NO2. CL2. Etc. In addition storage environment must not have materials that emit corrosive gases especially from silicon、cyanic、Formalin and phenol group, otherwise ,the motor will not run.

9-4 马达使用/ Motor operation

9-4-1 小心拿取、使用。

To handle and hold the vibration motor case softly.

9-4-2 避免放置在磁性物体附近或接触其表面，这将影响其功效。

Do not bring magnetized object near or contact with the surface of motor to avoid of performance being deteriorated.

9-4-3 注意操作环境，尤其注意若铁粉被磁铁吸附，将出现噪音问题，降低使用寿命。

Pay attention to the handling and working environments of motor, because such objects as iron powder if attracted by motor magnet, will cause noise characteristic deterioration ,thus reducing the reliability.

9-4-4 请勿靠近磁体或有磁场的装置存放或运行电机。

Please do not operate or store the motor near magnet or magnetic devices.

9-4-5 在使用和打开马达外包装时请避免水气结。

Condensation of atmosphere must be avoided in motor usage or opening the packaging of the motor.

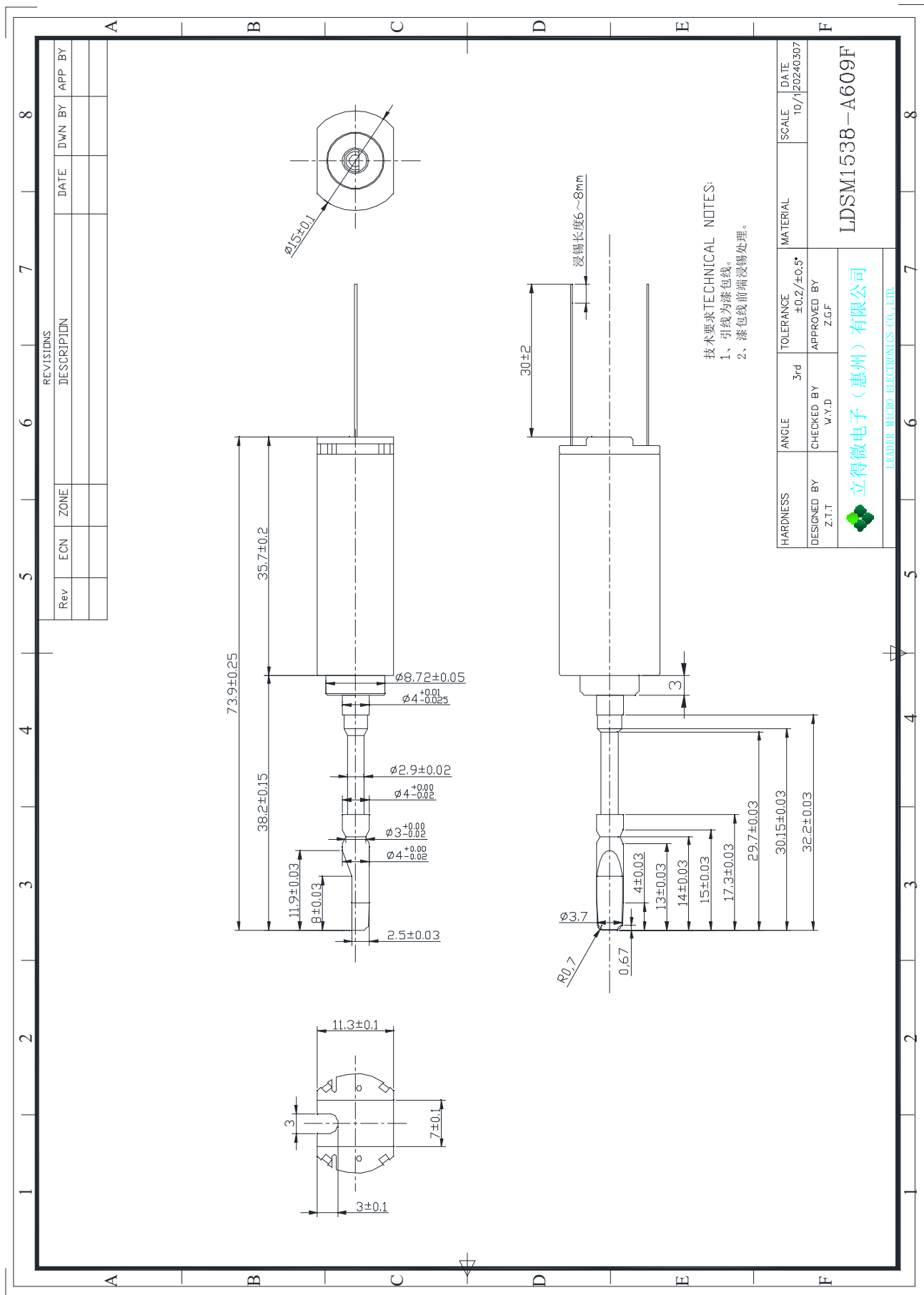
9-4-6 在输出轴部不可施加过大的外力，避免减速器内部受损。

Do not press the shaft with a excessive force to avoid any damage to the gear body.

9-4-7 焊接应在 1-2 秒内完成,以免损坏端子或导线。

To avoid damaging terminals or lead wires, soldering time should be completed within 1-2 seconds.

10. 外形图/ Mechanical Drawing:



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11. 更改记录/ Revision Records:

CUSTOMER 顾客		SPEC NO 规格书号	编号/No.: leader-A609
PRODUCT MODEL 产品型号	LDSM1538-A609F	DATE 日期	2024.03.07

REVISION RECORDS
修改记录表

REV NO 修改号	DATE 日期	PAGE 页码	REVISION ITEM 修改项目	REASON 更改原因
REV,0	2023.09.05	/	产品发布	
REV,1	2024.03.07	/	更新完善产品规格书	内部更改