

 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

立得微电子（惠州）有限公司

Leader Micro Electronics (Huizhou) Co., Ltd.

产 品 规 格 书

PRODUCT SPECIFICATION

客 户 信 息 Customer Information	客户名称/Customer	
	客户料号/Part No.	
	客户承认签/Customer Apprroved Signatures	

产 品 信 息 Product Information	文件编号/Spec No.	LEADER-BC-0257F	
	品名/Description	线性振动马达 Linear Vibrator Motor	
	规格型号/Model	8.0×9.0×3.5T,170Hz,0.9Vrms AC	
	日期/Date	2024.05.18	
	编制/Designed	审核/checked	批准/Approved
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 	SPECIFICATION	PRODUCT	LINEAR VIBRATOR
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		REVISION NO.	REV.00

规格书目录

Specification Content

No.	规格书内容/Specification contents	页码/Page
1	适用范围/General	4
2	使用条件/Operating Condition	4
3	测定条件/Determination Conditions	4
4	性能标准/ characteristics Standard	5
5	机械性能/Mechanical characteristics	6
6	测定方法/ Determination Condition	7
7	可靠性实验/Reliability Test	8/9
8	判断特性/Requirements after reliable test	10
9	使用注意事项/Points for Attentions	11
10	包装/Packing	12/13
11	马达外形图/Motor outline drawing	14

 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

1、适用范围/General

本规格书适用于线性振动马达 LD0809AA 系列。

This specification applies to linear type motor LD0809AA series.

2、使用条件/Operating conditions

项目/Item		规格/Specification
2-1	额定电压/Rated Voltage	0.9 Vrms AC, Sinewave
2-2	使用电压范围/Operating Voltage	0.1 ~0.95 Vrms AC
2-3	输入频率/Input Frequency	170±8 Hz
2-4	振动方向/Direction of vibration	X axis
2-5	使用环境/Operating Environment	-20℃~+70℃无水气凝结 (65±20%RH)
2-6	保存条件/Storage Conditions	-40℃~+85℃无水气凝结 (65±20%RH)

3、测定条件/Determination Conditions

一般情况下，马达可以在 22~28℃，相对湿度 45~85%RH 的环境中测试. 为保证一致性，测试应在下表规定内进行 Normally, the motor could be tested under 22~28℃, 45~85%RH. To ensure the coherence, it must be tested under below environment requirements:

项目/Item		规格/Specification
3-1	温度/Temperature	25℃±3℃
3-2	湿度/Humidity	65±20%RH
3-3	气压/Air Pressure	1011±40 hpa

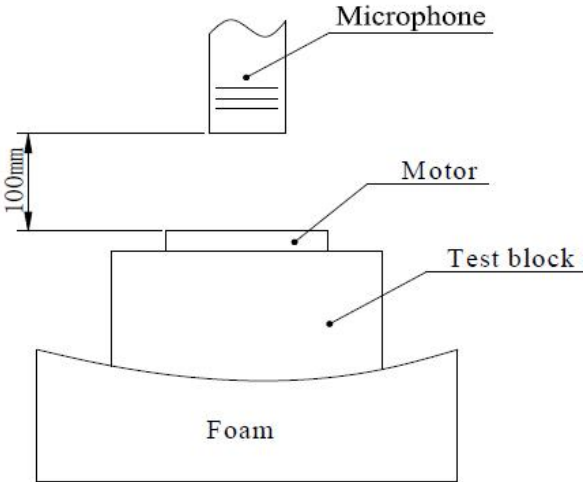
 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

4、性能标准/ characteristics Standard

项目 Item		规格 Specification	测试条件 Test Condition	
4-1	额定电压 Rated Voltage	0.9VrmsAC, Sine wave	0.9VrmsAC, Sine wave	
4-2	额定频率 Rated Frequency	170±8 Hz	170Hz, 0.9VrmsAC, sine wave	
4-3	额定电流 Rated Current	Max145mA _{rms}		
4-4	Acceleration F0 点振动量	0.65±0.12G		
4-5	Start Time 启动时间	Max 100ms 额定电压及谐振频率下, 从上电开始, 振动量上升至90%额定振动量的时间	170Hz, 0.9Vrms AC, sine wave	
4-6	Stop time 停止时间	Max 130ms 驱动电压撤销后, 从下电开始, 振动量下降至 10%额定振动量的时间	170Hz, 0.9Vrms AC, sine wave	
4-7	绝缘电阻 Insulation Resistance	10MΩ Min (100V)	在 100V 直流电压下机壳与导线 /At DC 100V Between wire and case	
4-8	阻抗 Resistance	8.0±1.0 Ω	在 25℃ 下/Below 25℃	
4-9	瞬态振动量 Transient vibration acceleration	0.9±0.15Gp	9Vp+1cycle sine wave@F0	

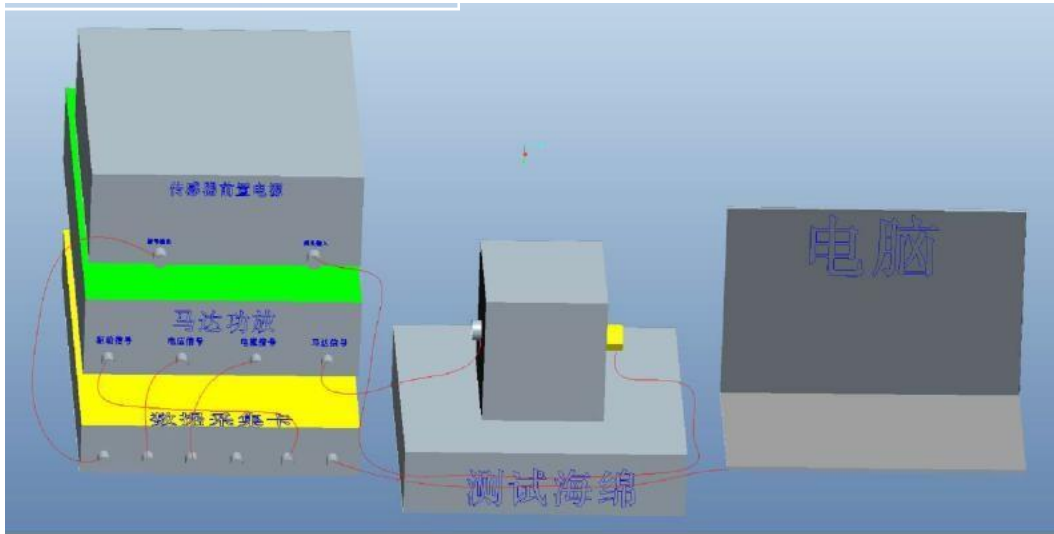
 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

5、机械性能/Mechanical characteristics

项目 Item		规格 Specification	测试条件 Test Conditions
5-1	噪音/Noise	45分贝最大/45dB Max. (10cm distance from microphone/ 距离麦 克风10 cm 的位置	170Hz, 0.9VrmsAC, sinewave) 在额定电压下。 At rated voltage 背景噪音：不大于28dB. A计权 Back ground noise 28dB (A) Max 
	静态压力试验	50N, 1min	1) 测试前对样品进行外观、性能检查，需满足规格要求； 2) 使用平面压头，压头表面大于马达样品表面； 3) 将待测样品正面向上放置在精密荷重仪的刚性平面上，位于压头正下方，启动精密荷重仪，压头以 5mm/min 速度下降，直至载荷达到 50N； 4) 保持载荷 50N 1 分钟，卸去载荷；
5-2	马达尺寸 Vibrator Size	L9.0*W8.0*H3.5 mm	micrometer calipers

 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
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			REVISION NO.	REV.00

6、测试方法/Test Method



Linear Vibrator Test Method/线性马达测试方法

- 测试工装尺寸及重量：40mm*40mm*40mm，100g。
The dimension and weight of test jig: 40mm*40mm*40mm， weight:100g.
- 马达必须放置必须穿过测试工装的质心。
The motor should be fixed by cross the center of test jig.
- 加速度探头必须放置在马达的正对面。
The acceleration sensor should be fixed on the opposite of motor.

 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

7. 可靠性实验/Reliability Test

项目/Item		测试条件/Test Condition	判定标准/Judgment
7-1	自然跌落 Drop test	1. 重量约 220g (包括马达本身)落向花岗岩地面 2. 高度: 1.5m 3. 方向: 6 个面, 4 个角 4. 次数: 3 Cycles 220g $\pm$ 5g test jig (the motor contained) , drop from 1.5m, the contact surface is monto granite base, six faces and four corners with three cycles.	试验后马达性能满足 8.0 condition B 判定要求 After the test, the 8.0 condition B pass criteria must be satisfied.
7-2	低温放置 Low temperature storage test	温度/Temperature: $-40 \pm 2^{\circ}\text{C}$ 时间/Time :96H	试验后马达性能满足 8.0 condition B 判定要求 After the test, the 8.0 condition B pass criteria must be satisfied.
7-3	高温放置 High temperature storage test	温度/Temperature: $85 \pm 2^{\circ}\text{C}$ 时间/Time :96H	
7-4	湿度放置 Humidity storage test	温度/Temperature: $85 \pm 2^{\circ}\text{C}$ 湿度/Humidity: 85%RH 时间/Time :500H 无水气凝结/No condensation of moisture	
7-5	温度冲击试验 Temperature shock test	低温 -40°C 30 分钟, 高温: 85°C 30 分钟 温度转换时间小于 20 秒, 共 50 个循环。 $-40^{\circ}\text{C} @ 30 \text{ minutes}$ and $85^{\circ}\text{C} @ 30 \text{ minutes}$, the exchange time within 20seconds, 50 cycles.	试验后马达性能满足 8.0 condition B 判定要求 After the test, the 8.0 condition B pass criteria must be satisfied.

				SPECIFICATION	PRODUCT	LINEAR VIBRATOR
					MODEL	LD0809BC
					REVISION NO.	REV.00
7-6	寿命 Lifetime test	1、试验循环 /Test cycle:1,000,000 cycle (1cycle: 2sec on/1sec off)			试验后马达性能满足 8.0 condition A 判定要求 After the test, the 8.0 condition A pass criteria must be satisfied.	
7-7	高温高湿寿命 High temperature and humidity Life	温度/Temperature:65±2℃ 湿度/Humidity:95%RH 时间/Time :44H			试验后马达性能满足 8.0 condition A 判定要求 After the test, the 8.0 condition A pass criteria must be satisfied.	
7-8	连续寿命试验 /Continuous life	-10℃工作 24 小时, 55℃工作 24 小时, 25℃常温 192 小时, 合计 240 小时 24 hours@-10℃, 24 hours@55℃, and 192 hours@25℃, total 240 hours			试验后马达性能满足 8.0 condition A 判定要求 After the test, the 8.0 condition A pass criteria must be satisfied..	
7-9	盐雾试验/Salt spray test	喷雾环境温度:35℃, 盐雾浓度: 5%NaCl溶液 在35℃条件连续喷雾24小时			试验过程中, 任一时间点停止试验, 马达外壳及 FPC pad 腐蚀情况满足规格书要求 Stop the test at any time, the crust and FPC pad corrosion situation must meet the specification request.	
7-10	振动试验 /Vibration test	220g ± 5g 工装常规测试: 5-500Hz , PSD=0.04g ² /Hz X, Y, Z三轴每轴1小时; The motor fixed fixture weight 220g ± 5g, Frequency:5 ~ 500Hz, PSD =0.04g ² /Hz Do the test for one hour per three straight shaft directions.			试验后马达性能满足 8.0 condition B 判定要求 After the test, the 8.0 condition B pass criteria must be satisfied.	

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				REVISION NO.	REV.00
7-11	滚筒试验 /Tumbling test		220g±5g 跌落工装, 常规: 高度 0.5 米, 次数为 500 次, 跌落的接触面为钢板;推荐 10-12 次/分钟 220g ± 5g test jig (the motor contained),half a meter high, 500 times,the contact surface is steel base,10-12 per minute recommended.		试验后马达性能满足 8.0 condition B 判定要求 After the test, the 8.0 condition B pass criteria must be satisfied.

8、判断特性/Requirements after reliable test

试验后应满足下列条件/Test pass criteria

After reliability tests, all test samples must be meet the following conditions, otherwise they will be regarded as NG.

Condition A:

F0 变化量: 不超出初始值±8Hz;

Within ±8Hz of F0 measured before tests.

工作电流变化: ≤ ±20%

Within 20% of work current measured before tests

振动量变化: ≤ ±20%

Within 20% of Acceleration measured before tests @ F0

停止时间变化不超过+/-20ms;

Within 20ms of stop time measured before tests @ F0

噪音: ≤48dB;

Max 48dB(A);

Condition B:

F0 变化量: 不超出初始值±8Hz;

Within ±8Hz of F0 measured before tests.

工作电流变化: ≤ ±10%

Within 10% of work current measured before tests

振动量变化: ≤ ±10%

Within 10% of Acceleration measured before tests @ F0

停止时间变化不超过+/-20ms;

Within 20ms of stop time measured before tests @ F0

噪音: ≤48dB;

Max 48dB(A);

试验后马达外观无明显变形, 开裂等

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			MODEL	LD0809BC
			REVISION NO.	REV.00

9、使用注意事项/ Points for Attentions

9-1. 必须安装规格书标准使用, 否则性能与寿命都将受到相当的减少, 必须注意电压的使用范畴.

Make sure to use the motor in accordance with the specifications, if not, the lifetime might be reduced accordingly, pay high attention to the range of the voltage.

9-2. 建议马达在 6 个月内使用, 不要在以下环境中使用及保存.

10-2-1. 高温与高湿的场所.

10-2-2. 腐蚀性气体, 如: H₂S, SO₂, NO₂, Cl₂;

10-2-3. 生锈场所;

The motor is suggested using within 6 months. Do not use or store the motor under below environments:

10-2-1. High temperature and high humidity area;

10-2-2. Corrosive gas such as H₂S, SO₂, NO₂, Cl₂;

10-2-3. Dusty area;

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音, 性能会降低, 从而降低产品的可靠性.

Pay attention to the working environment of the motor, avoid any iron material sucked by the motor, or the motor might cause noise and the performance will be degraded, meanwhile, the reliability might be reduced.

9-4. 应确信本产品不会违背相关的标准, 以及法律法规与行政令.

Make sure the product will not violate any local relevant standards, as well as laws and regulations.

9-5. 拿马达时, 要轻拿轻放.

Handle with care.

9-6. 钢板面边缘有少许锈斑是允许的.

A little rusty spot at the steel plate surface is allowed.

9-7. 我司遵循持续发展的策略, 在不预先通知的情况下, 有对产品 (部品) 进行修改和改进的权利,

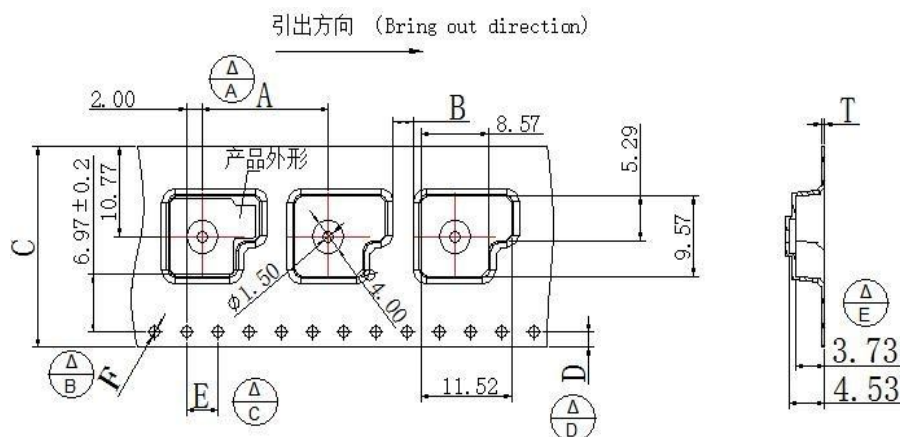
当然这些都不会影响马达的特性及使用功能.

Our company follow the sustainable developing strategy, and have the right to make change and improvements to our product without giving notice in advance . of course , these changes and improvements will not affect the characteristics and function of the motor.

 	SPECIFICATION		PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

10、包装/Packing

10-1 载带包装（材料:PS 黑色 防静电）



尺寸栏 (dimensions)	
D	1.75±0.10
F	1.50 ± $\begin{smallmatrix} 0.10 \\ 0.00 \end{smallmatrix}$
E	4.00±0.10
10*E	40.00±0.20
C	24.00±0.20
拔模角 (draft angle)	5° -6°
T	0.40±0.05
B	2.6
A	16.00±0.10

技术要求:

1. 10个边孔的累计公差不能超过±0.1mm。

The accumulative tolerance of ten side holes should not exceed 0.1mm

2. 材料规格: PS 黑色抗静电, 厚度0.4mm。

Material specification: PS, Black, anti-static, 0.4mm thick.

3. 13英寸卷轮卷装长度: 15.36米 (参考)。

The length of the 13 inch reel is 15.36 meters. (for references)

4. 13吋卷轮包装零件总颗数: 960颗, 实际包装数量900颗。产品包装时内圈空格30颗, 产品包装时外圈空格30颗。

The total packing numbers the reel: 960 pieces, with inner 30 pieces, and outer 30 empty pieces, the actual packing motor number is 900 pieces.

5. 胶盘颜色: 蓝色。

The reel color is blue.

6. 标记Δ为重要控制项目, 未注公差按0.1mm。

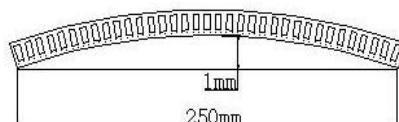
The dimension labeled Δ are important, and the tolerance not indicated is 0.1mm.

7. 所有尺寸设计参照EIA-481-C-2003。

All the dimensions design should follow the EIA-481-C-2003.

8. 载带在250mm长度以内最大弯曲度不超过1mm (见下图)。

The maximum bending of the tape should not exceed 1mm within 250mm. (see the picture below)





SPECIFICATION

PRODUCT

LINEAR VIBRATOR

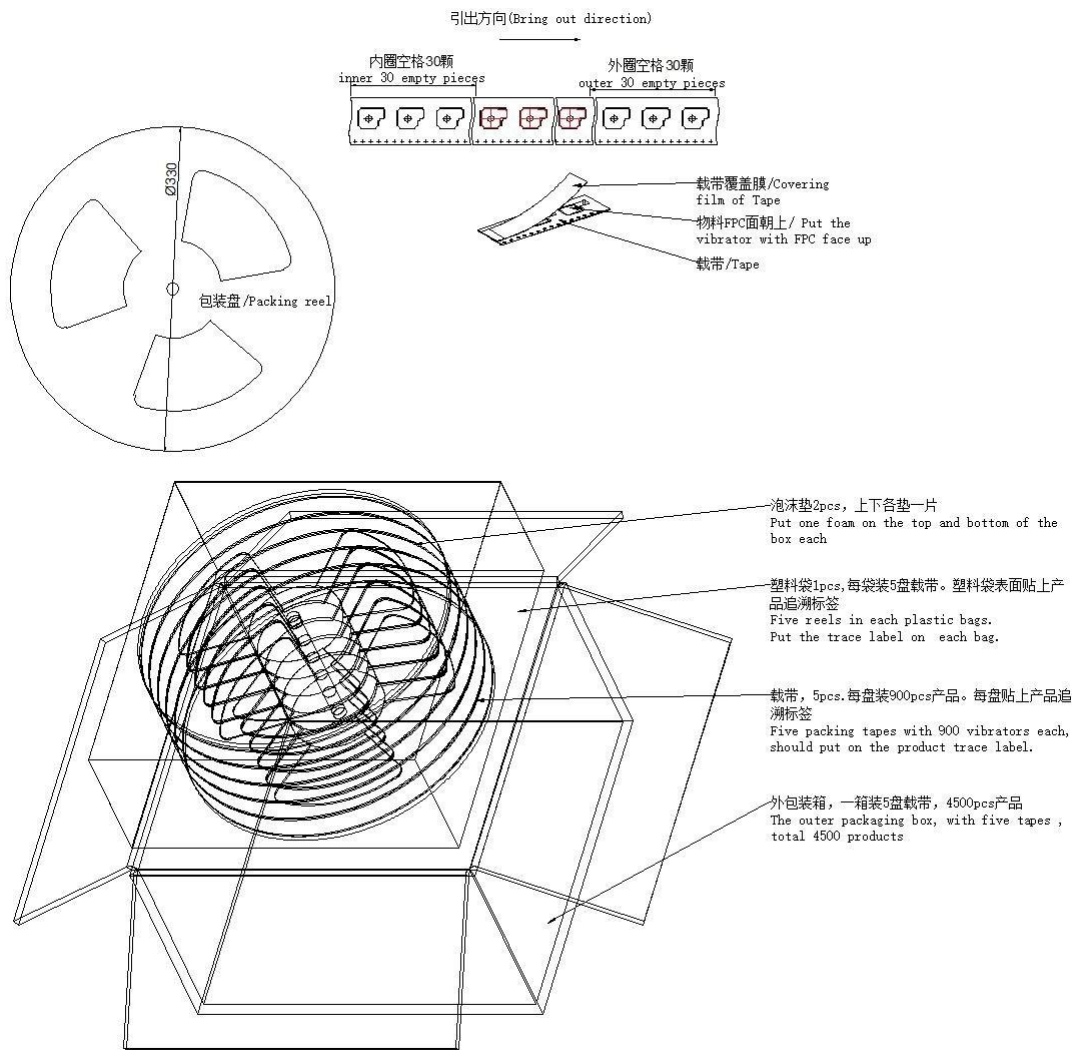
MODEL

LD0809BC

REVISION NO.

REV.00

10-2 纸箱包装



标签：卷盘上面贴一张追溯标签

 LEAD-FREE	 HF HF0809BC/0809BC-0809BC	SPECIFICATION	PRODUCT	LINEAR VIBRATOR
			MODEL	LD0809BC
			REVISION NO.	REV.00

11.马达外形图/Motor outline drawin

