

## 产品规格书

## PRODUCT SPECIFICATION

客 户 信 息	客户名称/ Buyer Name	
	客户料号/Buyer's Part No.	
	客户承认签章 /Buyer's Approval & Signatures	

金 龙 公 司	文件编号/Spec No.	KOTL-L-B-044	版本: X1
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	送样日期/Date		
	设计/Designed by	审核/Checked by	批准/Approved by
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**Specification Content**

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### 修改记录/Change Records

版本/ Version	拟制人/DRI	拟制日期 /Date	更改理由/ Reason of Change	主要更改内容/ Description of Change
X1	李福庆	2022.02.18	Draft	

# 马达需求规格书/Linear Vibrator Specification

## 1. 适用范围/Applicable scope

本规格书适用于线性振动马达 081530 系列，包括使用条件、测定条件，性能标准，机械性能，测试方法，可靠性试验，使用注意事项，包装和外形图等。

This specification applies to linear type motor 081530 series, the document contains applicable conditions, measurement conditions, performance standard, mechanical characteristic, test methods, reliability tests, usage attentions, packing and outline drawings.

## 2. 使用条件/Applicable conditions

编号/Number	名称/Item	规格/Specification	备注/Notes
2.1	额定电压 Rated Voltage	0.9Vrms AC	最大工作电压 Input voltage should be lower than 0.9Vrms
2.2	工作电压 Work Voltage	0.1-0.95Vrms AC	低于额定电压时马达能振动;高于额定电压时马达能正常工作 The linear vibrator can vibrate below the rated voltage; while can vibrate over the rated voltage with no problem
2.3	振动方向 Vibration Direction	X axis	振子振动方向为产品的长度方向 The vibration direction is defined as the product length direction
2.4	使用环境 Operating Environment	-20℃~+70℃, Ordinary Humidity:65±20%RH	无水汽凝结 No condensation of moisture
2.5	输入频率 Input Frequency	170 Hz	谐振频率 Resonant Frequency
2.6	保存条件/Storage Conditions	-40℃~+85℃, Ordinary Humidity:65±20%RH	无水汽凝结 No condensation of moisture

## 3. 测定条件/Measurement 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 vibrator could be measured under 22~28℃,45~85%RH. For coherence, it must be measured 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

#### 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	0.9Vrms AC, Sine wave	0.9Vrms AC, Sine wave
4-2	额定频率 Rated Frequency	170Hz	@nominal rated voltage
4-3	额定电流 Rated Current	Max 130mArms	0.9Vrms AC, F0, sine wave Refer to Figure 1
4-4	F0 点振动量 Acceleration	0.9±0.2Grms	0.9Vrms AC, F0, sine wave Refer to Figure 2
4-5	频率特性 Frequency Characteristics	170±10Hz 参照图形 1 Refer to Figure 1	
4-6	瞬态振动量 Transient vibration acceleration	1.0+0.20/-0.15Gp	7Vp+1cycle sine wave@F0
4-7	上升时间 Rise Time	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 The time from 0 up to 90% maximum acceleration.	170Hz, 0.9Vrms AC, sine wave
4-8	下降时间 Falling Time	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 The decay time free fall acceleration from 100% down to 10%.	170Hz, 0.9Vrms AC, sine wave
4-9	绝缘电阻 Insulation Resistance	10MΩ Min (100V)	在 100V 直流电压下马达端子与外壳的绝缘电阻 Min 10MΩ @100V DC between terminal and housing
4-10	端子阻抗 Resistance	9.0±1.0 Ohm	25°C ± 3°C

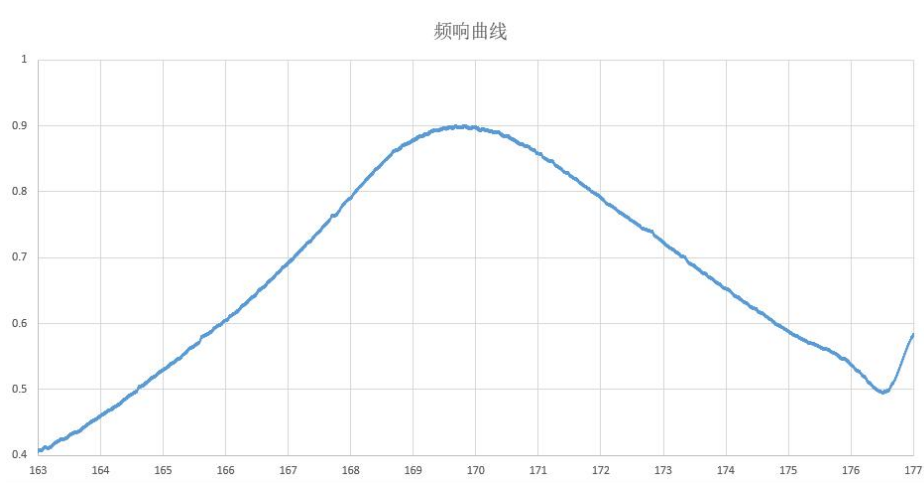


Figure 1. Linear Vibrator Frequency Characteristics/频率特性

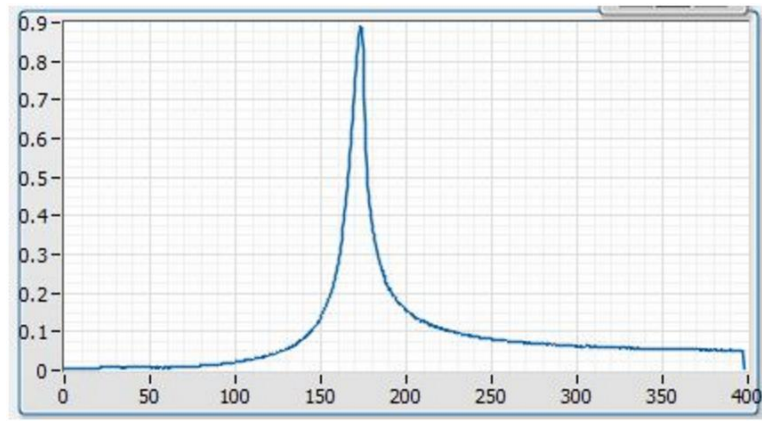
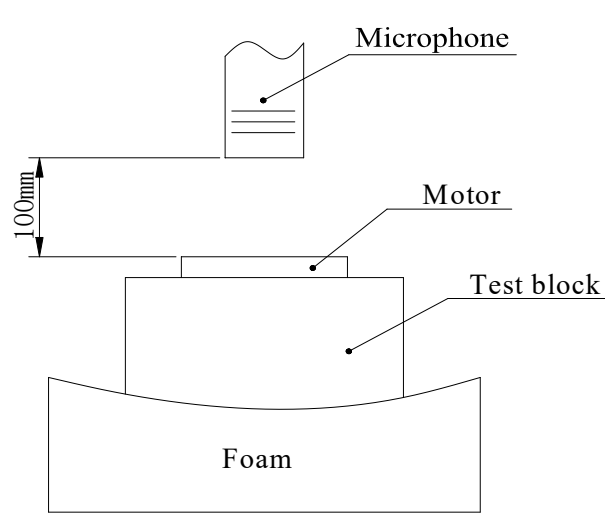
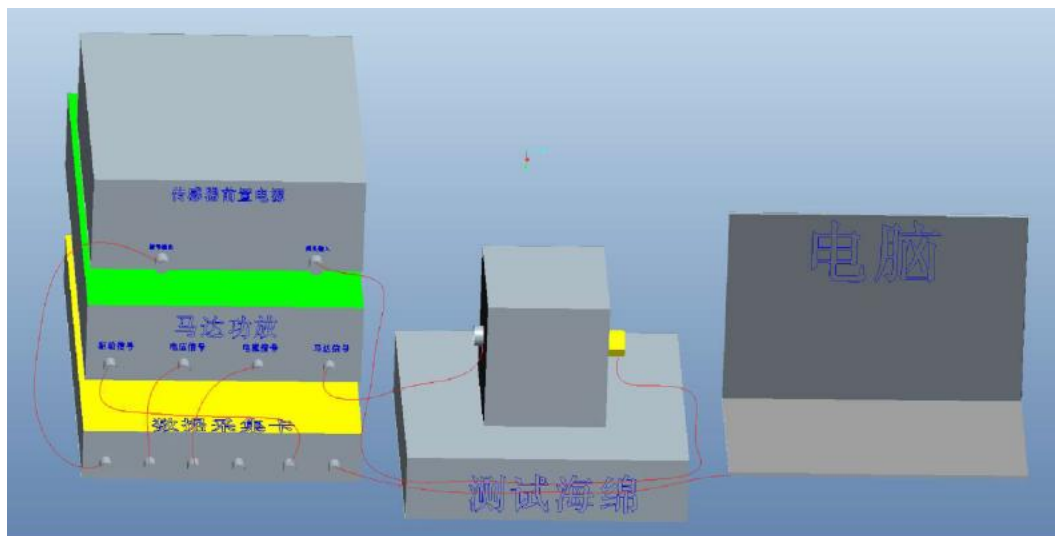


Figure 2. Linear Vibrator Acceleration-over-frequency characteristics chart from 0 ~ 400Hz

## 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 dBA Max. 距离麦克风10 cm 的位置 10cm distance from microphone	170Hz, 0.9Vrms AC, sine wave 背景噪音:不大于28dBA. Background noise 28dBA Max. 
5-2	马达尺寸 /Vibrator Size	L15*W8.0*H3.0 mm	micrometer calipers

## 6、测试方法/Test Method



### Linear Vibrator Test Method/线性马达测试方法

#### Note:

- 测试工装尺寸及重量：48mm\*87mm\*11mm，100g。  
The dimension and weight of test jig: 48mm\*87mm\*11mm, weight:100g.
- 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.

## 7、可靠性性能/Reliability characteristics

### 7.1 测试项目/Test item

序号/ Number	测试项目/ ORT Item	测试条件/Test Condition	判定标准/ Pass/Fail Criteria	数量/ Quantity	频次/ Frequency
7.1.1	滚筒跌落 试验/  Repeat random drop Test (Tumbler)	测试条件：用 180g 的工装从 50cm 高度 跌落至钢板上。随机跌落 500 次，循环 速度 10-12 次/分。/ Test condition: Drop from 50cm height with a 180g jig to a steel plate. Random drop for 500 times, Rotation speed 10-12 times / min.	1. 谐振频率：变化 率在试验前的±5 内 /1 Resonant frequency: within ±5 of original 2. 噪音：Max 48dBA/ 2 Noise: Max 48dBA 3. 振动量：变化率在 试验前的±30%内/ 3 Vibration: within ±30% of original 4. 上升时间：在规格 范围内 (max 100ms) /4 Rising time: within SPEC. (max 100ms)	3pcs/生产线  / 3pcs/line	一周一次  / Weekly
7.1.2	自由跌落 试验/ Free fall drop Test	测试条件：用 180g 的工装从 150cm 高度 跌落至钢板或混凝土面上。跌落 6 个面， 4 个角，3 个循环，共 30 次跌落。/ Test condition: Drop from 180cm height with a 180g jig to a steel or concrete surface. Drop 6 faces and 4 corners, 3 cycles, total 30 drops.	5. 下降时间：在规格 范围内 (max 130ms) /5 Fall time: within SPEC. (max 130ms)	3pcs/生产线  / 3pcs/line	每天一次 / Daily
7.1.3	微跌试验/ Micro-dro p Test	测试条件：用 180g 工装从 10cm 高度跌 落至钢板上。每个面 1000 次 (1000x6)， 共 6000 次。/ Test condition: Drop from 10cm height with a 180g jig to a steel plate. Each surface one thousand times (1,000 x 6), total 6,000 drops. .		3pcs/生产线  / 3pcs/line	每天一次 / Daily
7.1.4	振动试验/ Random Vibration Test	180g±5g 工装常规测试：5-500Hz， PSD=0.04g <sup>2</sup> /Hz， X/Y/Z 三轴每轴 1 小时； The motor fixed fixture weight 180g ±5g， Frequency:5~500Hz, PSD =0.04g <sup>2</sup> /Hz Do the test for one hour per three straight shaft directions.		5/生产线  / 5/line	每月一次 / Monthly



7.1.5	高温高湿 试验/ High Temperatu re and High Humidity Operation al Test	测试条件:65±2℃,90%±5%RH, 48 小时, 运行: 2s on/3min off ./ Test condition: 65±2℃,90%±5%RH, 48hours, running at 2s on/3min off .		4/生产线  / 4/line	两周一次  / Two weekly
7.1.6	低温试验/ Low temperatu re Operation al Test	测试条件: -30C° /不管控湿度运行 48 小时, 2s on/2min off。/ Test condition: -30C° / uncontrolled RH for 48hours, running at 2s on/2min off .		4/生产线  / 4/line	两周一次  / Two weekly
7.1.7	温度冲击 试验/ Thermal shock Test	测试条件: -40C° to +75C° , 50 个循 环, 高低温各 30 分钟。/ Test condition: -40C° to +75C° , 50 cycles, 30mins at low and high temp .		4/生产线  / 4/line	两周一次  / Two weekly
7.1.8	盐雾试验/ Salt mist Test	测试条件: +35 C° , 5%Nacl, 24 小时/ Test condition: +35 C° , 5%Nacl, 24 hours		2/生产线  / 2/line	每周一次  / Weekly
7.1.9	常温寿命 试验/ Life Test (Alarm mode)	电源 (0.9Vrms AC, 170Hz) 测试条件: 正常温湿度下运行: 2 s on / 1s off, 共一百万个循环。/ DUT power on (Under 0.9Vrms AC, 170Hz). Test condition: 2 s on / 1s off, normal temperature & humidity, total 1,000,000 cycles.		4/生产线  / 4/line	两周一次  / Two weekly

## 8、使用注意事项/ Points for Attentions

8-1.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.

8-2.建议马达在 6 个月内使用,不要在以下环境中使用及保存.

8-2-1.高温与高湿的场所;

8-2-2.腐蚀性气体，如：H<sub>2</sub>S,SO<sub>2</sub>,NO<sub>2</sub>,CL<sub>2</sub>;

8-2-3.生锈场所。

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

8-2-1.High temperature and high humidity area;

8-2-2.Corrosive gas such as H<sub>2</sub>S,SO<sub>2</sub>,NO<sub>2</sub>,CL<sub>2</sub>;

8-2-3.Dusty area;

8-3.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.

8-4.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.

8-5.拿马达时，要轻拿轻放。

Handle with care.

8-6.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.

8-7.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.

## 9、包装/Packing

9.1 单个Tray放置产品80pcs，产品盖板朝下放置。

Put 80pcs of products in a single Tray with the cover plate facing down.

9.2 单个内箱放置20Tray，最上1pcs Tray不放产品， $80\text{pcs} \times 18\text{tray} = 1440\text{pcs}$ 产品。

Place 20 trays in a single inner box and not put products in the top 1pcs Tray.  $80\text{pcs} \times 19\text{tray} = 1520\text{pcs}$  products.

9.3 单个外箱放置2个内箱体， $1440\text{pcs} \times 2 = 2880\text{pcs}$ 产品。

Single outer box to place 2 inner boxes.  $1520\text{pcs} \times 2 = 3040\text{pcs}$  products.

9.4 内箱尺寸：340\*260\*180，外箱尺寸：530\*350\*200，单位：mm。

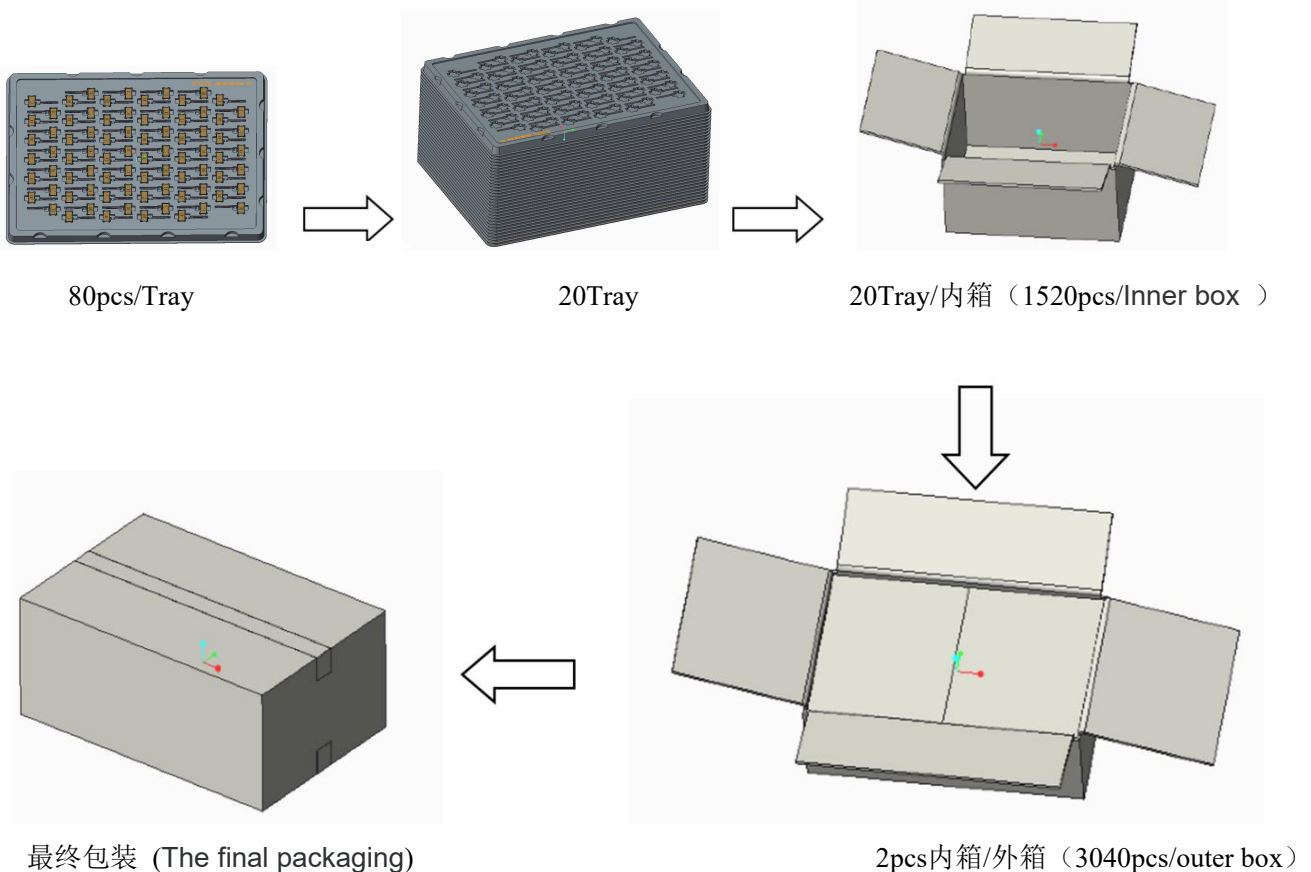
Inner box size: 340\*260\*180, outer box size: 530\*350\*200, unit: mm.

9.5 内箱上下放置纸垫板。

Paper plate put up and down the inner box.

9.6 外箱体外侧标示产品品名，型号，厂名。

The name of product, model and manufacturer shall be marked on the outside of the outer box.

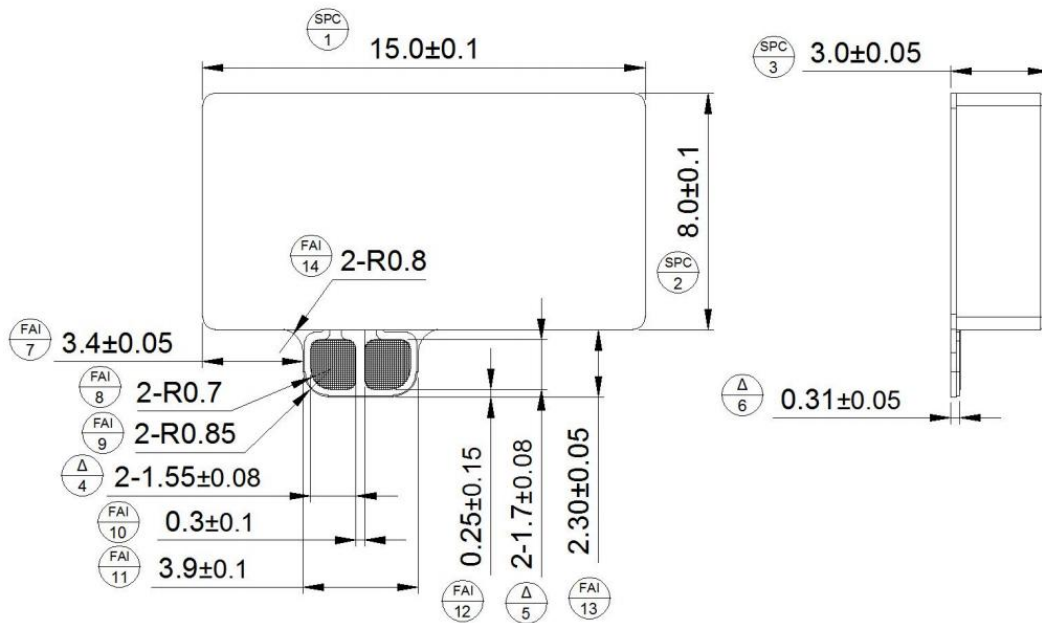


### 包装信息/Packing information

## 10、产品 2D/3D 图/ Product 2D/3D drawing

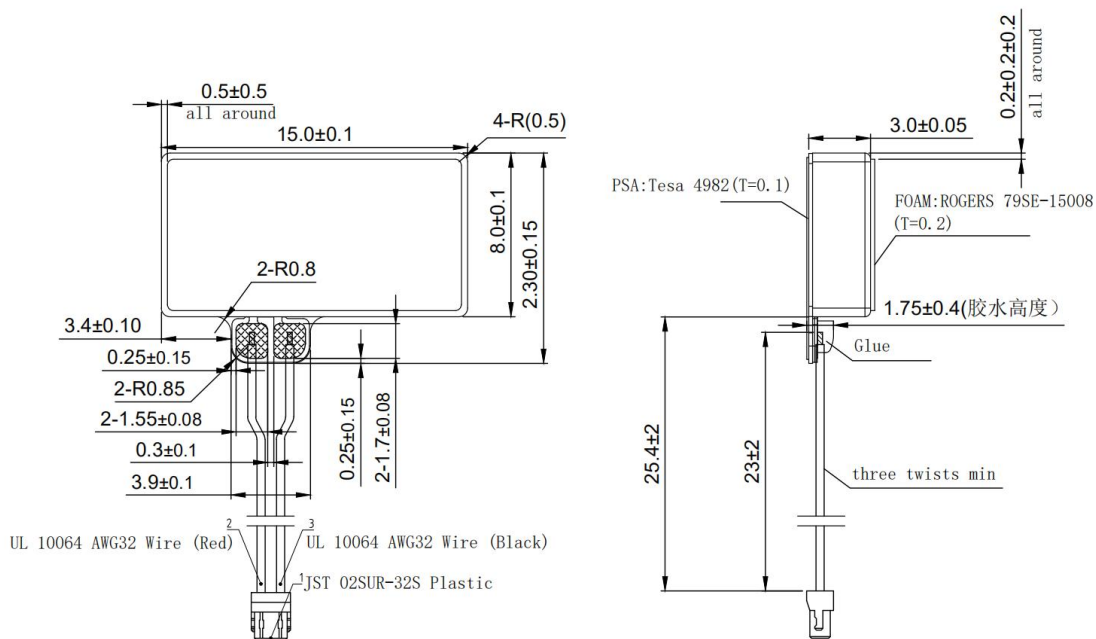
### 10.1 马达产品2D/3D图

Motor 2D/3D drawing

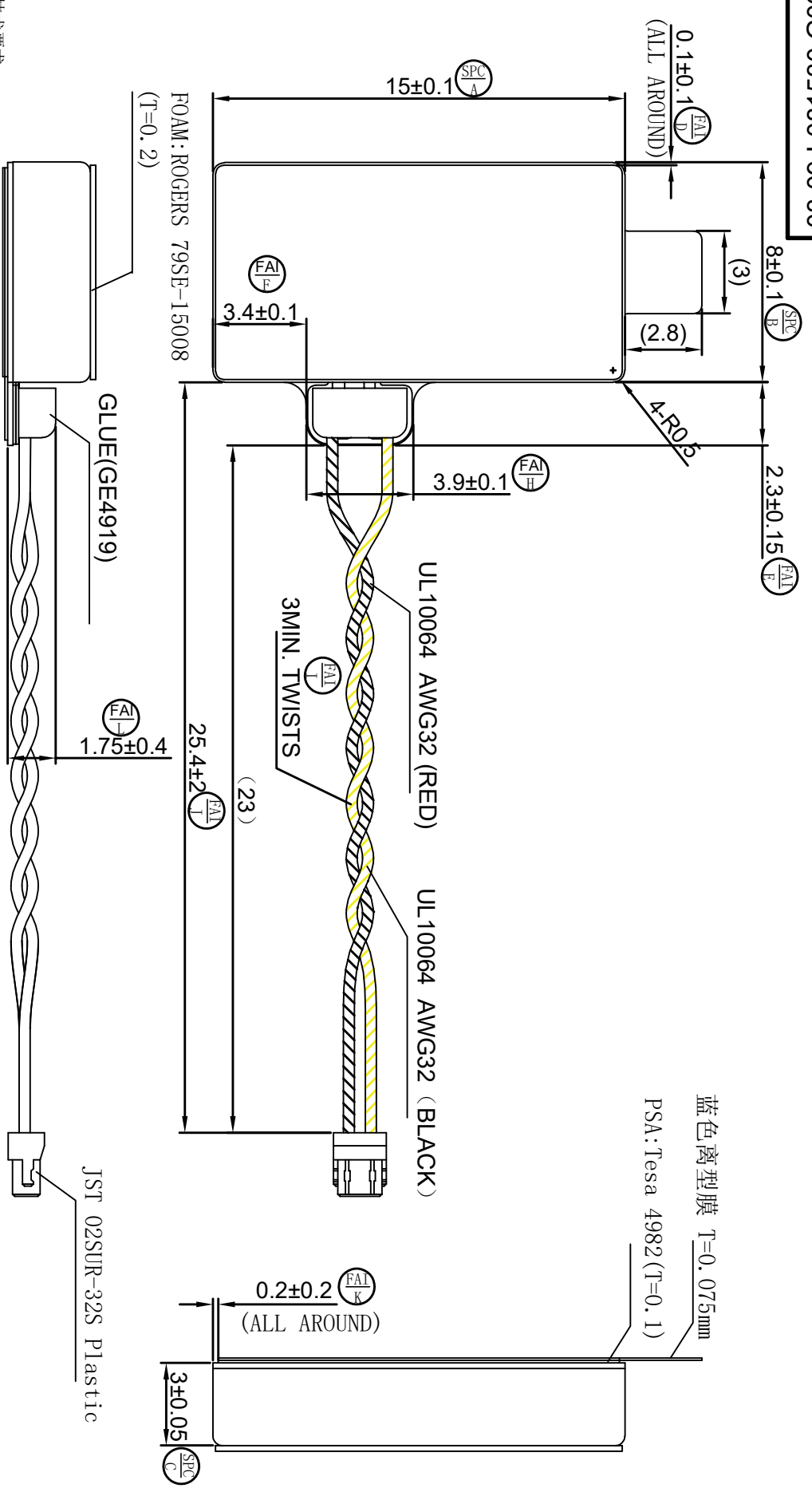


### 10.2 最终产品2D/3D图

Final product 2D/3D drawing



F900G.035180T.60.30



技术要求:

- 1) 成品必须满足 (EU) WEEE和RoHS认证要求。
- 2) 所有尺寸均为最终成品尺寸, 未注公差 ±0.1/±1°。
- 3) 标记SPC项目的为关键控制尺寸, 测量数量32pcs, 需要满足Cp不低於1.67且Cpk不低於1.33。
- 4) 标记Δ的为重要控制项目, 作为IQC重点检测项目, 测量数量32pcs, FAI尺寸为重要控制项目, 测量3pcs。
- 5) 外观不能有脏污, 划痕等缺陷, 产品需符合对应的客户外观, 性能, 测试检验标准, 超出检验标准的任何缺陷需要明示, 且需以限度样征得客户承认。
- 6) 该产品与客户产品实配, 符合对应的客户外观, 性能, 测试检验标准。
- 7) 符合金龙机电最新版《禁用有害物质标准》。

旧版图总号	
底图总号	
签字	
日期	
档案员	日期

设计	处数	版本号	签字	标准	日期
制图			审定	批准	
校对					2020.06.17
工艺					

成品外形图

X向线性振动电机

金龙机电股份有限公司

03.09.L081530.G006F

图样标记	单位	比例
A1	mm	5:1
第 1 页	共 1 页	