



# 产品规格书

## PRODUCT SPECIFICATION

客户名称Buyer Name	
客户料号Buyer Part No.	
客户承认签章 Buyers Approval & Signatures	

文件编号Spec No.		版本	A/0
品名描述 Product Description	圆柱振动马达 Cylindrical Vibration Motor		
型号Part No.	Z3TH8B171700L		
送样日期Date			
设计Designed by	审核Checked by	批准Approved by	
陳满	陈满	陈满	
2021.03.12	2021.03.12	2021.03.12	

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产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 2 / 16	版本/version:A/0

## - 目录/List -

封面/Cover	1/16
目录/Contents	2/16
更改记录/Revision History	3/16
1.结构形式/Construction Form	4/16
2.适用范围/Scope Of Application	4/16
3.测试条件/Testing Condition	5/16
4.贮存环境/Storage Environment	5/16
5.电气特性/Electrical Characteristics	5/16
6.机械特性/Mechanical Characteristics	7/16
7.环境试验/Environmental Test	9/16
8.寿命试验/Life Test	11/16
9.环保要求/Environment Protections	12/16
10.注意事项/Caution	13/16
11.外形图/Outside View	15/16
12.包装要求/Packaging Require	16/16



产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 4 / 16	版本/version:A/0

### 1.结构形式/Construction Form

本规格书适用于移动电话的振动马达。

This datasheet is stipulated for vibration motor, which is for mobile phone.

NO.	项目/Item	规格/Specifications
1-1	电机结构 Motor construction	Φ2.5 圆柱形铁芯直流电机 Φ2.5 DC Cored motor
1-2	换向片数 Number of phases	3 组换向片 3-phases
1-3	磁极数 Number of magnet poles	两极 (外置磁极型式) 2-poles (Inner magnet type)
1-4	线圈 Coil construction	铁芯线圈 Iron-cored coil
1-5	整流技术 Rectifying method	采用高精度电刷和换向器 Precious brush and commutator

### 2.使用条件/Standard Operating Condition

NO.	项目/Item	规格/Specifications
2-1	额定电压 Rated voltage	DC2.7V
2-2	使用电压范围 Operating voltage range	DC 2.3~3.3V
2-3	旋转方向 Rotating direction	CW / CCW
2-4	使用温度范围 Operating temperature range	-30℃~+70℃

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 5 / 16	版本/version:A/0

### 3.测试条件/Testing Condition

NO.	项目/Item	规格/Specifications
3-1	温度 Temperature	20℃ ±2
3-2	湿度 Humidity	45% ~85%RH
3-3	电源电压 Power supply, voltage source	直流电源或电池 2.7V DC power supply or battery 2.7V
3-4	马达安放状态 Posture of motor	水平/Horizontal

### 4.贮存环境/Storage Environment

NO.	项目/Item	规格/Specifications
4-1	贮存温度 Storage temp	-40℃ ~+85℃
4-2	相对湿度 relative humidity	5%~95% (No condensation of moisture/无水汽 凝结)

### 5.电气特性/Electrical Characteristic

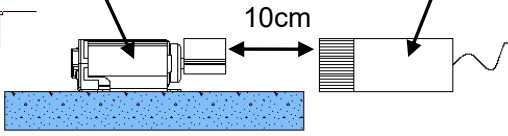
NO.	项目/Item	单位 /Unit	规格/SPEC.	条件/Condition
5-1	额定转速 Rated speed	rpm	13000 ± 2500	额定电压:DC 2.7V Rated voltage:DC 2.7V
5-2	额定电流 Rated current	mA	100Max	在额定电压和额定负载下测试 /Measure at rated voltage and rated load
5-3	启动电流 Starting current	mA	110Max	在额定电压下锁定振动轮，测电机电流 (2/3R 极端电阻处，不在电刷和整流子 两点接触的位置)/Measure current at locked counter weight ( R1.7 × 2.8) in rated voltage(2/3R R:1 extreme resisting rate,Not in the position when the brushes contact the commutator at the two contact points)

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 6 / 16	版本/version:A/0

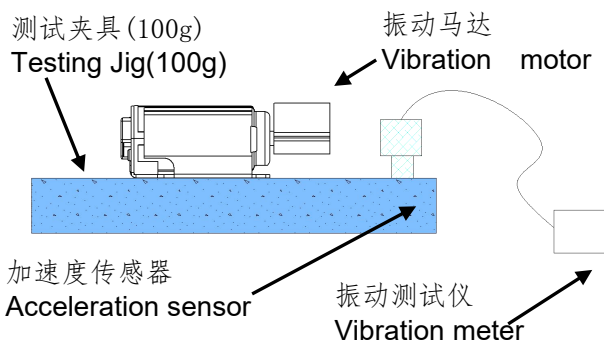
5-4	启动电压 Starting voltage	V	2.3Max	DC2.3V电压下,开/关为1个循环,共3个循环 On/off-1cycle,total 3cycles under DC2.3V
5-5	端子阻抗 Terminal resistance	$\Omega$	单相 1phase:26+4/-2	正极和负极之间 Between positive and negative
5-6	绝缘电阻 Insulationresistance	M $\Omega$	10Min	测量机壳和引线之间。 测试电压直流100V。 Measuring between case and lead wire.Test voltage DC 100V

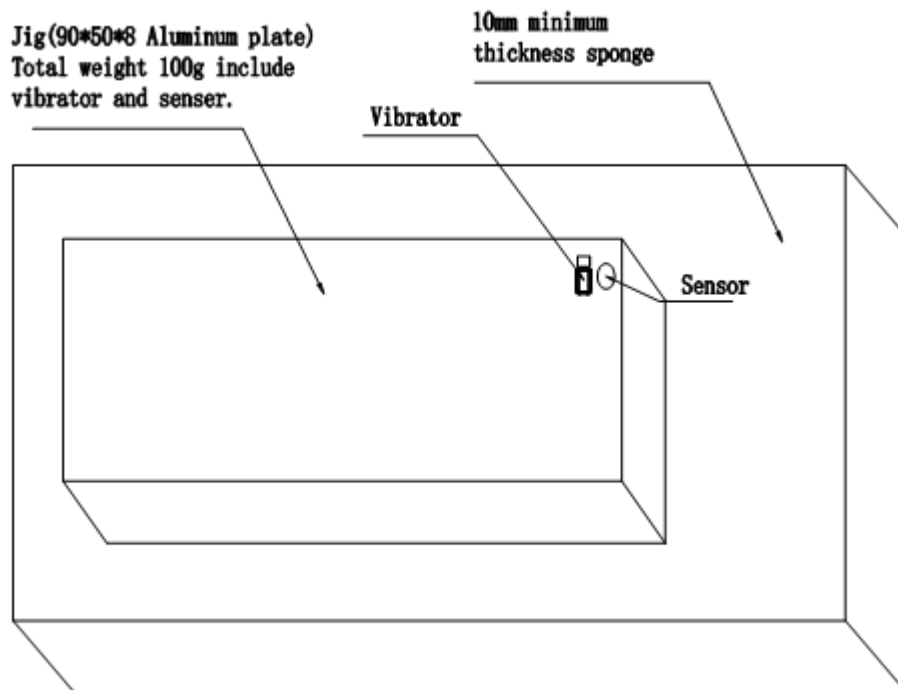
产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 7 / 16	版本/version:A/0

## 6.机械特性/Mechanical Characteristics

NO	项目/Item	单位/Unit	规格/SPEC.	条件/Condition
6-1	外观 Appearance	/		目测/Visual
6-2	尺寸 size	mm	见外形图/See outline of drawing	使用游标卡尺和千分尺测量/Use vernier caliper and micrometer to measure
6-3	马达重量 Motor Weight	g	0.55±0.2g	使用天平测量/Use scale
6-4	机械噪音 Mechanical Noise	dB	50 MAX	<p>振动马达 Vibration motor</p> <p>拾音器 microphone</p>  <p>10cm</p> <p>测试夹具 Testing Jig</p> <p>马达：被固定/Motor : be fixed            额定电压:DC 2.7V/Rated voltage : DC 2.7V            背景噪音： 25dB MAX.  <b>Back ground noise: 25dB MAX.</b>            拾音器沿轴向正对电机平面  <b>Microphone faces the plane of motor along the shaft</b></p>

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 8 / 16	版本/version:A/0

6-5	振动量 Vibration Strength	Grms	0.4MIN	 <p>测试夹具 (100g) Testing Jig(100g)</p> <p>振动马达 Vibration motor</p> <p>加速度传感器 Acceleration sensor</p> <p>振动测试仪 Vibration meter</p> <p>马达: 被固定/Motor : be fixed. 额定电压:DC 2.7V/Rated voltage : DC 2.7V .</p>
		Gp	0.57MIN	
6-6	响应时间 Responsive Time	ms	100	50ms 达到 50%振感,100ms 达到 90% 振感/ Motor vibration sense reach to 50% within 50ms,and 90% within 100ms.

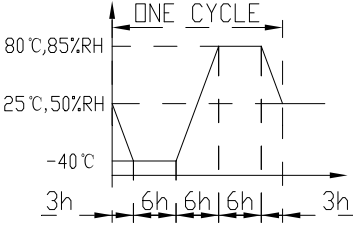


Simulation Vibration test method



产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 9 / 16	版本/version:A/0

## 7. 环境试验/Environmental Test

NO	项目/Item	条件/Condition
7-1	高温贮存试验 High temperature Storage test	在+80℃的环境下放置96小时，然后在常温常湿下恢复4小时后测试。 Exposed at +80℃ for 96hours, then return to normal temperature and humidity for 4 hours before test.
7-2	低温贮存试验 Low temperature Storage test	在-40℃的环境下放置96小时，然后在常温常湿下恢复4小时后测试。 Exposed at -40℃ for 96hours, then return to normal temperature and humidity for 4 hours before test.
7-3	湿热试验 Humidity test	在温度50℃，湿度95%的环境下放置48小时，然后在常态下放置4小时后测试。/Resistan cetest 48hrs at 50℃,96%HR,then recovery 4hr at normal temperature.
7-4	高低温试验 Heat cycle test	<p>确保电机在下图所示的条件下放置一个周期(马达表面避免有水汽凝结)，然后在室温下恢复4小时后，进行测试。/Confirmed to operating of motor during 1 cycles as following test condition (without presence of water droplets on the motor), then return to normal temperature and humidity for 6 cycle before test.</p> 
7-5	振动试验 Vibration test	<p>将马达固定在100g的塑料夹具上，按以下要求进行试验：</p> <ol style="list-style-type: none"> <li>1)振频范围:10-55Hz</li> <li>2)全振幅 2mm</li> <li>3)振频变化10-55-10 约1分钟</li> <li>4)振动方向:三个垂直方向</li> <li>5)持续时间:每个方向30分钟（共90分钟）</li> </ol> <p>The motor that is attached to a 100g jig (plastic housing) and test according following condition:</p> <ol style="list-style-type: none"> <li>1)Vibration frequency range: 10~55Hz</li> <li>2)Total amplitude: 2 mm</li> <li>3)Sweep ratio: 10~55~10Hz approximate 1min</li> <li>4)Direction of vibration: Three perpendicular directions</li> <li>5)Duration: 30min(90min in total)</li> </ol>

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 10 / 16	版本/version:A/0

7-6	跌落试验 Drop test	<p>将马达电机放在大约60g（包括电机）重的物体上,从1.5米的高度跌落到20mm厚的大理石板上，跌落18次。/Drop the motor from the height of 1.5 meters to the marble board of 20mm thick, Drop 18 times.</p> <p>高度/Height: 1.5m 方向/Direction: <math>\pm X</math>, <math>\pm Y</math>, <math>\pm Z</math></p> <p>次数/Times: 每一平面下落3次，共计18次/Three drops per plane for a total of 18 drops.</p>
7-7	盐雾试验 Salt spray test	<p>电机放置盐雾试验箱，试验箱内湿度35%，盐溶液浓度<math>5 \pm 1\%</math>；PH值为6.5-7.2；盐雾沉降量为1-2ml/80cm；浓度为5%的中性盐溶液中24小时。持续期满，清洗试验样品表面，用干净的棉布擦拭后进行检测，要求马达外观、振动功能良好，表面无腐蚀现象。</p> <p>Put the motor in the salt spray test box for 24 hours, the humidity in the test case should be 35%, concentration of salt solution be <math>5 \pm 1\%</math>, PH value be 6.5-7.2, the precipitation of salt fog be 1-2ml/80cm, and the neutral salt solution should be with a concentration of 5%. At the end of the period, clean the surface of the tested sample, and then do further test once wiped with a clean cotton cloth. The appearance and vibrating function of the motor are required to be in good condition, and the surface should be free of corrosion.</p>

▶ 判定标准/Judgment standard

① 试验后，测试数据必须符合以下规格：

After test, measured data must be satisfied as following specifications;

- 启动电压: DC1.5V MAX.
- Starting voltage: DC1.5V MAX.
- 额定转速: 变化率在初始值的+30%~-20%以内。
- Rated speed: changing rate must be within +30%~-20% of initial value.
- 额定电流: 变化率在初始值的+20%~-30%以内。
- Rated current: changing rate must be within +20%~-30% of initial value.
- 端子阻抗: 变化率在初始值的 $\pm 15\%$ 以内。
- Terminal resistance: changing rate must be within  $\pm 15\%$  of initial value.

② 外形结构无异常。

There should be no abnormalities in appearance and structure.

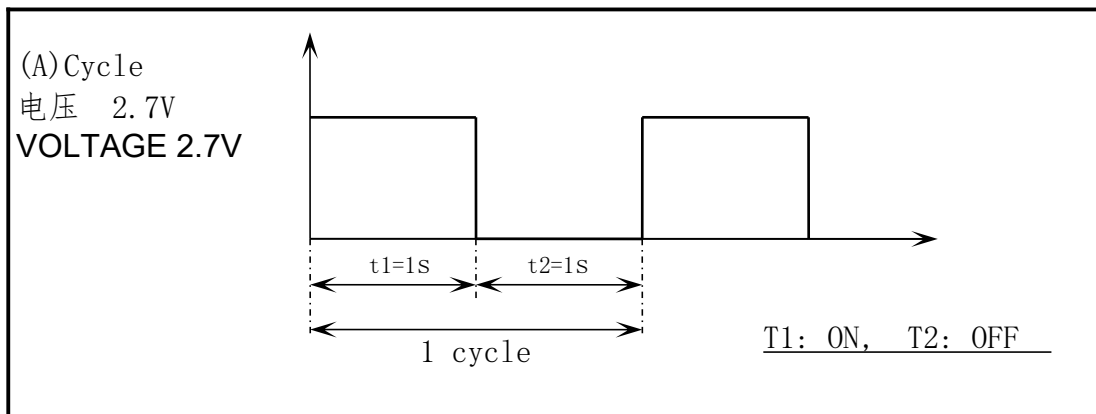
产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 11 / 16	版本/version:A/0

### 8.寿命试验/Life Test

输入 2.7V 电压/Input voltage 2.7V.

带负载重量 (R1.7, t2.8 大约 0.21g) /Load counter weight (R1.7, t2.8 appx0.21g).

NO	项目/Item	条件/Condition
8-1	常温寿命试验/Room Temperature Life Test	放置在室温 $25 \pm 2^{\circ}\text{C}$ , 50%RH 的湿度条件下/Room Temperature exposure $25 \pm 2^{\circ}\text{C}$ , 50%RH .
8-2	高温高湿寿命试验 /High temperature and Humidity Exposure Life test	放置在高温 $55 \pm 2^{\circ}\text{C}$ , 95%RH 的条件下/High Temperature exposure $55 \pm 2^{\circ}\text{C}$ , 95%RH .
8-3	低温寿命试验 /Low temperature Exposure Life test	放置在高温 $-10 \pm 2^{\circ}\text{C}$ 的条件下/Low Temperature exposure $-10 \pm 2^{\circ}\text{C}$ .



#### 8-1-1 常温寿命试验/Room Temperature Life Test

1.按A周期运行72小时/To maintain (A)cycle for 72hrs in the process of temperature shock.

#### 8-2-1 高温寿命试验/High temperature Exposure Life test

1.按A周期运行24小时/To maintain(A)cycle under high temperature for 24hrs.

#### 8-3-1 低温寿命试验/Low temperature Exposure Life test

1.按A周期运行24小时/To maintain(A)cycle under high temperature for 24hrs.

#### ▶ 判定标准/Judgment standard

①试验后，测试数据必须符合以下规格：

After test, measured data must be satisfied as following specifications;

- 启动电压: DC1.5V MAX.
- Starting voltage: DC1.5V MAX.

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 12 / 16	版本/version:A/0

- 额定转速: 变化率在初始值的+30%~-20%以内。
- Rated speed: changing rate must be within +30%~-20% of initial value.
- 额定电流: 变化率在初始值的+20%~-30%以内。
- Rated current: changing rate must be within +20%~-30%of initial value.

### 9.环保要求/Environment Protections

本产品所有零部件符合欧盟RoHS指令（2011/65/EU,(EU)2015/863//无卤/REACH指令要求，具体环境有害物质管控限制如下：

This product conforms to the EU ROHS(2011/65/EU,(EU)2015/863, halogen-free and REACH certification,Specific content as follows:

铅及其化合物最大允许含量为1000ppm/Lead and Lead compounds $\leq$ 1000ppm  
 镉及其化合物最大允许含量为100ppm/Cadmium and cadmium compounds $\leq$ 100ppm  
 汞及其化合物最大允许含量为1000ppm/Mercury and Mercury compounds $\leq$ 1000ppm  
 六价铬化物最大允许含量为1000ppm/Hexavalent chromium compounds $\leq$ 1000ppm  
 多溴联苯(PBB)最大允许含量为1000ppm/Polybrominated biphenylethers $\leq$ 1000ppm  
 多溴联苯醚(PBDE)最大允许含量为1000ppm/Polybrominated diphenylethers $\leq$

1000ppm

邻苯二甲酸二异丁酯（DIBP）最大允许含量为1000ppm /DIBP $\leq$ 1000ppm  
 邻苯二甲酸二丁酯(DBP)最大允许含量为1000ppm /DBP $\leq$ 1000ppm  
 邻苯二甲酸苄基酯(BBP)最大允许含量为1000ppm/BBP $\leq$ 1000ppm  
 邻苯二甲酸二（2-乙基己基酯(DEHP)最大允许含量为1000ppm/DEHP $\leq$ 1000ppm  
 六溴环十二烷(HBCDD)最大允许含量为1000ppm/HBCDD $\leq$ 1000ppm  
 溴Br最大允许含量为900ppm/Br $\leq$ 900ppm  
 氯Cl最大允许含量为900ppm/Cl $\leq$ 900ppm  
 溴加氯之和最大允许含量为1500ppm/Br+Cl $\leq$ 1500ppm

REACH 指令按最新法规内容管控执行/The instructions are subject to the latest regulations

包装材料环保管控要求：Pb, Cd, Hg, Cr+6 : 4种物质总和 $<$  100ppm (其中, Cd $<$ 50ppm)。  
 /Environmental control requirements for packaging materials

: Pb+Cd+Hg+Cr6  $<$  100ppm (其中, Cd $<$ 50ppm)

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 13 / 16	版本/version:A/0

## 10.注意事项/Caution

- (1)该马达是微型精密产品，在运输过程中不要承受超过0.5 kgf的力，否则会引起外形或性能的变化。  
As this motor is small and precise, do not press it over 0.5kgf force or while transportation, it can cause the transformation of performance or external appearance.
- (2)请注意马达不要接触到液体性物质（比如：水，酒精等）  
please be careful, not to be contacted fluid substances (such as: water, alcohol etc.)
- (3)不要在高温下长时间放置，否则有可能导致电机的性能下降。  
Do not expose the motor to high temperature for a long periods of time, it may cause a decline in performance.
- (4)马达不要在以下环境中使用：  
- 高温和高湿的场所  
- 腐蚀性气体如H<sub>2</sub>S、SO<sub>2</sub>、NO<sub>2</sub>等  
Avoid using the motor in the following environment.  
- High temperature and high humidity area.  
- Corrosive gas such as H<sub>2</sub>S、SO<sub>2</sub>、NO<sub>2</sub> etc.
- (5)请不要在靠近磁铁或带有磁场的仪器旁边使用或存放马达。  
Please do not operate or store the motor adjacent to magnet or apparatus That has a magnetic field.
- (6)请注意机壳的表面存在漏磁通量。  
Please be careful that there exists a leaking magnetic flux on the surface of bracket.
- (7)电刷和换向器的相互作用，有可能产生轻微的电噪音。  
Due to interaction between brush and commutator, there is a possibility to occur electrical noise slightly.
- (8)因测试设备有误差，允许有±5%偏差。  
Beacause there is error of the measurement equipment ,permit the standard of the rotational frepency to ±5%

产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 14 / 16	版本/version:A/0

- (9) 接电端子扭曲、折弯次数不可多于2次。  
Current terminals should not be twisted or bent more than twice.
- (10) 被焊锡的端子局部受压不可多于2次。  
The portion when lead wire and terminal are soldered should not be under stressed more than twice.
- (11) 在马达通电时，不宜长时间锁住不转  
Do not subject the motor under locked condition for long hours.
- (12) 不可向马达一侧强行挤压接电端子  
Do not exert pressure by pushing the current terminals towards the direction of the internal motor.
- (13) 请在6个月内使用，在使用时和打开包装时，请避免水汽凝结。  
Please use the motors within six months and prevent them from coagulation of moisture when open the pockage and use them.
- (14) 马达通过ROHS认证  
This motor pass the system of ROHS certification.

(15)

出厂检验报告附上 35 只马达特性数据和 CPK 值,其中包括:

负载转速: rpm

负载电流: m A

堵转电流 (启动电流): m A

启动电压: 不考虑 CPK 值

Attached to OQC report are 35 motors' characteristic data and CPK value, including:

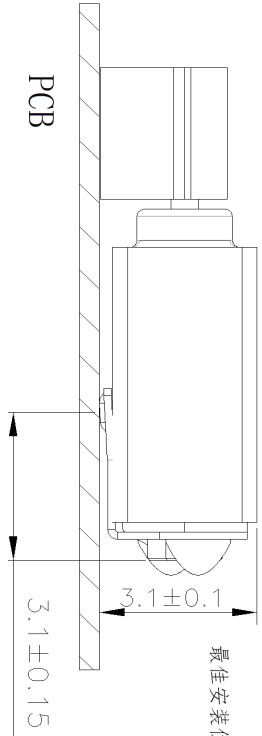
Loaded rotation: rpm.

Loaded current: mA

Lock current (Starting current): mA

Starting voltage: without the consideration of CPK value .

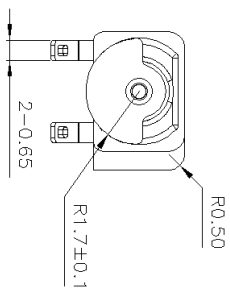
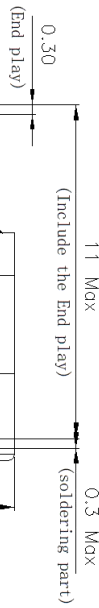
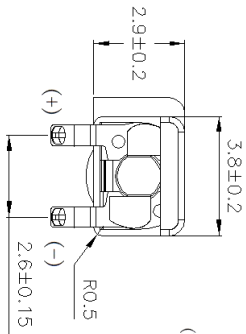
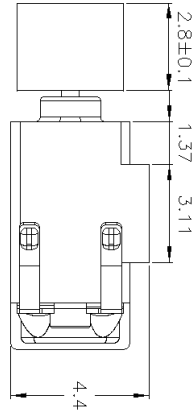
### 11.外形图/Outside View



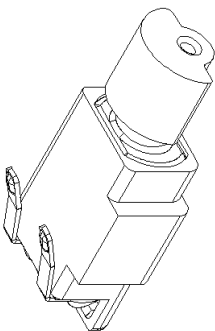
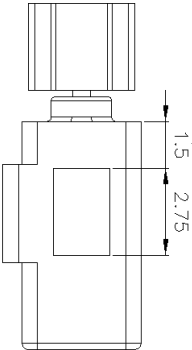
最佳安装位置: 3.1mm:

必须在壳体紧配情况下安装, 建议安装范围: 3.05-3.15mm:

接触片压缩量mm	弹力 (±2g)
0.2	30
0.45	65
1.0	95
1.2	120



技术要求/Technique requests:  
1. 电机轴向间隙 0.3mm Max/Axial play of shaft is 0.3mm max when counterweight rotating.



产品规格书/Specifications	日期/Date :2021-03-12	
振动马达/Vibration motor:Z3TH8B171700L	页码/Page : 16 / 16	版本/version:A/0

## 12. 包装要求/Packaging Require

工作内容和程序/Content and process

- 1、50 vibrators in each plastic capsule./每个吸塑盒里放 50 个电机。
- 2、Every 25 capsules as a group put a plastic cover on the group and wrap it in tape./每 25 个吸塑盒上盖一个纸板盖，用胶带捆成一捆。
- 3、Every 4 bags are put into an outer case with a size of  $350 \times 350 \times 260$  by the ways stipulated as the drawing./每 4 捆按图中的叠放方式放入一个外包箱（ $350 \times 350 \times 260$ ）。
- 4、Quantity and batch number are written on the surface of the outer case./数量、生产批号均写在外包装箱上。

