

Tsinglin Micro Motors Limited

产 品 规 格 书

Product specification

Product Name (产品名称): LINEAR VIBRATOR/线性振动器

Product Model (产品型号): TSL208-175S

Customer name (客户名称)	
Item of customer (客户项目)	
Customer part no. (客户料号)	
Customer approved (客户承认)	

拟 制 Drawn		审 核 Check		批 准 Approve	
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PRODUCT SPECIFICATION

Modle: TSL208-175S

Document NO.: 202230920-01

Revised record

修订记录

ISSUE 版本	REVISION CONTENT 修订内容	DRAWN 拟制	CHECK 审核	APPROVED 批 准	DATE 日期
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PRODUCT SPECIFICATION

Modle: TSL208-175S

Document NO.: 202230920-01

Table of contents

目录表

NO.	CONTENTS (内容)	PAGE (页码)	NOTE (备注)
1	Operating scope 适用范围	4	
2	Storage/Operating / Measure environmental conditions 使用和储存条件	4	
3	Measuring Conditions 测试条件	4	
4	Product performance 制品性能	5	
5	External performance 外观性能	6	
6	Reliability test 可靠性试验	7	
7	Outline drawing 外形图	8	
8	Encoding rules 编码规则	9	
9	Packaging requirements 包装要求	9	
10	Caution for Use 使用注意事项	9	

PRODUCT SPECIFICATION

Model: TSL208-175S

Document NO.: 20230920-01

1. Operating scope 适用范围

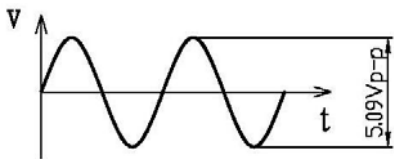
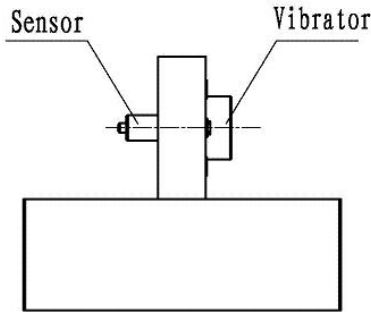
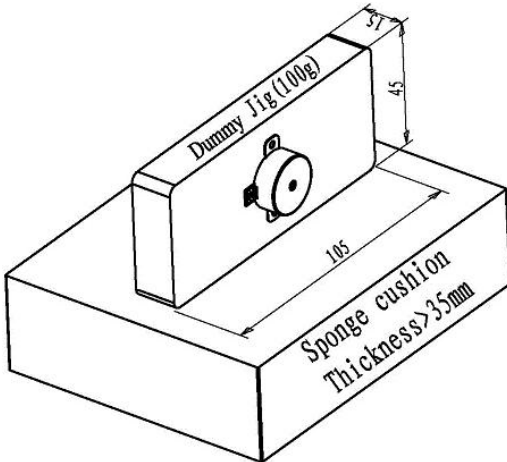
This specifications apply to xinnian linear vibrator model TSL208-175S.

本规格书适用于TSL208-175S 线性振动器。

2. Storage, Operating temperature / Humidity conditions (储存、使用温度/湿度条件)

No	Items (项目)	Conditions (条件)
2-1	Operating Environmental 使用环境	Temperature / 温度: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ Humidity / 湿度: $5 \sim 95\%\text{RH}$
2-1	Storage Environmental 储存环境	Temperature / 温度: $-40^{\circ}\text{C} \sim +120^{\circ}\text{C}$ Humidity / 湿度: $5 \sim 95\%\text{RH}$

3. Standard measurement conditions (标准测试条件)

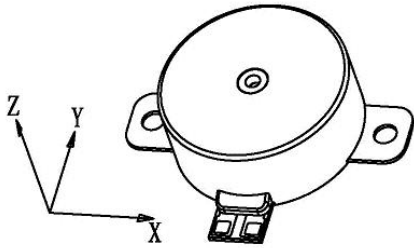
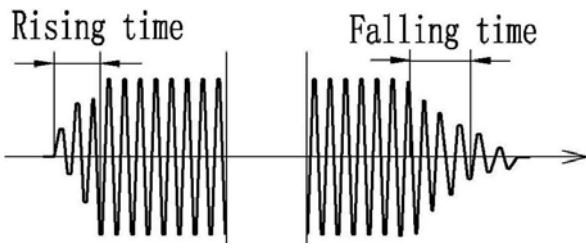
NO	ITEMS/项目	SPECIFICATION/规定
3-1	Temperature/温度	$20 \pm 5^{\circ}\text{C}$
3-2	Humidity/湿度	$(65 \pm 20\%)\text{RH}$
3-3	Rated voltage 额定电压	Sinewave $1.8 \pm 0.05\text{Vrms}$ ($V_p-p=5.09\text{V}$) 
3-4	Operating Frequency 工作频率	@F0 ($F0 \in 175 \pm 10\text{Hz}$)
3-5	Measuring method 测量方法	Place Vibrator As shown in the following figure (Lock the Vibrator on a 100g dummy jig) 振动器如下图所示放置 (固定在 100 克的测试夹具上) The direction of the sensor as same as the direction of Vibrator vibration (As item 4-2) 传感器检测方向和振动器振动方向保持一致。(参见项目 4-2) 

PRODUCT SPECIFICATION

Modle: TSL208-175S

Document NO.: 202230920-01

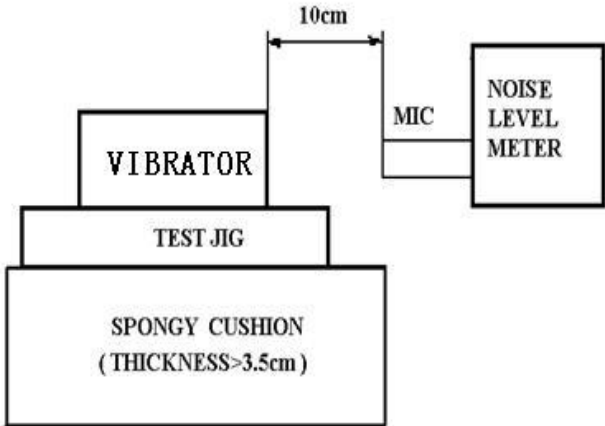
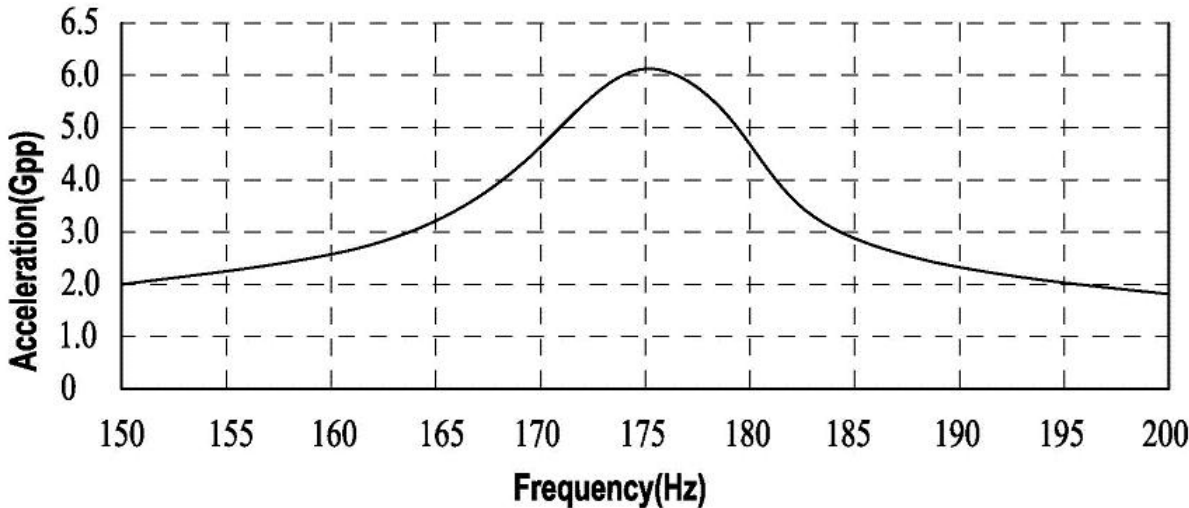
4. Product performance (制品性能)

NO	Items(项目)	Requirements (要求)	Conditions Or Remark (条件/备注)
4-1	Shape size 外形尺寸	$\phi 20*8$ (mm) not included welding position of lead wire and Mounting arm 不包含引线焊接部位 和安装臂	Details refer to page 8 
4-2	Vibration direction 振动方向	Z axis	
4-3	Weight/重量	10.8±0.5g	/
4-4	Resonant Frequency 谐振频率	175±10Hz	@ Sine wave 1.8Vrms
4-5	Operating voltage 工作电压	Maximum 2.0Vrms	Sine wave, Continuous Vibrate Mode/连续振动模式
		Maximum 9.0Vp_p	Sine wave, Boost Impulse Mode, Duration less than 30ms and interval time is greater than 70ms/升压冲击模式, 脉冲 持续时间小于 30ms, 间隔时间大于 70ms
4-6	Acceleration 振动加速度	6.0 ± 1Gpp	@ F0 Sinewave 1.8Vrms (5.09Vp_p)
4-7	Rise time 启动时间	≤50ms	Rise to 70% of the nominal acceleration 加速度上升到典型值的 70%  Down to 30% of the nominal acceleration 加速度下降到典型值的 30%
4-8	Falling time 断开时间	≤50ms	
4-9	Terminal resistance 端子电阻	9.0±1Ω	AT 20℃
4-10	Rated current 额定电流	≤150mArms	@F0 Sinewave 1.8Vrms
		≤200mArms	@other frequency Sinewave 1.8Vrms
4-11	Insulation resistance 绝缘电阻	10MΩ(Min)	100V DC, Between the vibrator terminal and case. 测试电 压 DC100V, 端子和外壳间。

PRODUCT SPECIFICATION

Modle: TSL208-175S

Document NO.: 202230920-01

4-12	Operating Attitude 工作姿态	All direction (全方向)																									
4-13	Mechanical Noise 机械噪音	60dB-A (MAX)	At rated voltage and load; F0 , Background noise 35dB-A (MAX)/在额定电压, 额定负载下测试, 背景噪音不超过 35dB. 																								
4-14	Frequency – Acceleration Characteristics (@sinewave 1.8Vrms) 频率-加速度特性曲线 (电压: 正弦波 1.8Vrms)  <table><caption>Frequency – Acceleration Characteristics Data</caption><thead><tr><th>Frequency (Hz)</th><th>Acceleration (Gpp)</th></tr></thead><tbody><tr><td>150</td><td>2.0</td></tr><tr><td>155</td><td>2.2</td></tr><tr><td>160</td><td>2.5</td></tr><tr><td>165</td><td>3.2</td></tr><tr><td>170</td><td>4.5</td></tr><tr><td>175</td><td>6.0</td></tr><tr><td>180</td><td>4.5</td></tr><tr><td>185</td><td>3.2</td></tr><tr><td>190</td><td>2.5</td></tr><tr><td>195</td><td>2.2</td></tr><tr><td>200</td><td>2.0</td></tr></tbody></table>			Frequency (Hz)	Acceleration (Gpp)	150	2.0	155	2.2	160	2.5	165	3.2	170	4.5	175	6.0	180	4.5	185	3.2	190	2.5	195	2.2	200	2.0
Frequency (Hz)	Acceleration (Gpp)																										
150	2.0																										
155	2.2																										
160	2.5																										
165	3.2																										
170	4.5																										
175	6.0																										
180	4.5																										
185	3.2																										
190	2.5																										
195	2.2																										
200	2.0																										

5. External performance (外观性能)

it should not remarkable wound and deleterious defect, No distortion、rust、stain, etc.

不应有明显的划伤、有害缺陷, 无变形、锈蚀、污迹等。

PRODUCT SPECIFICATION

Model: TSL208-175S

Document NO.: 202230920-01

6. Reliability test 可靠性试验

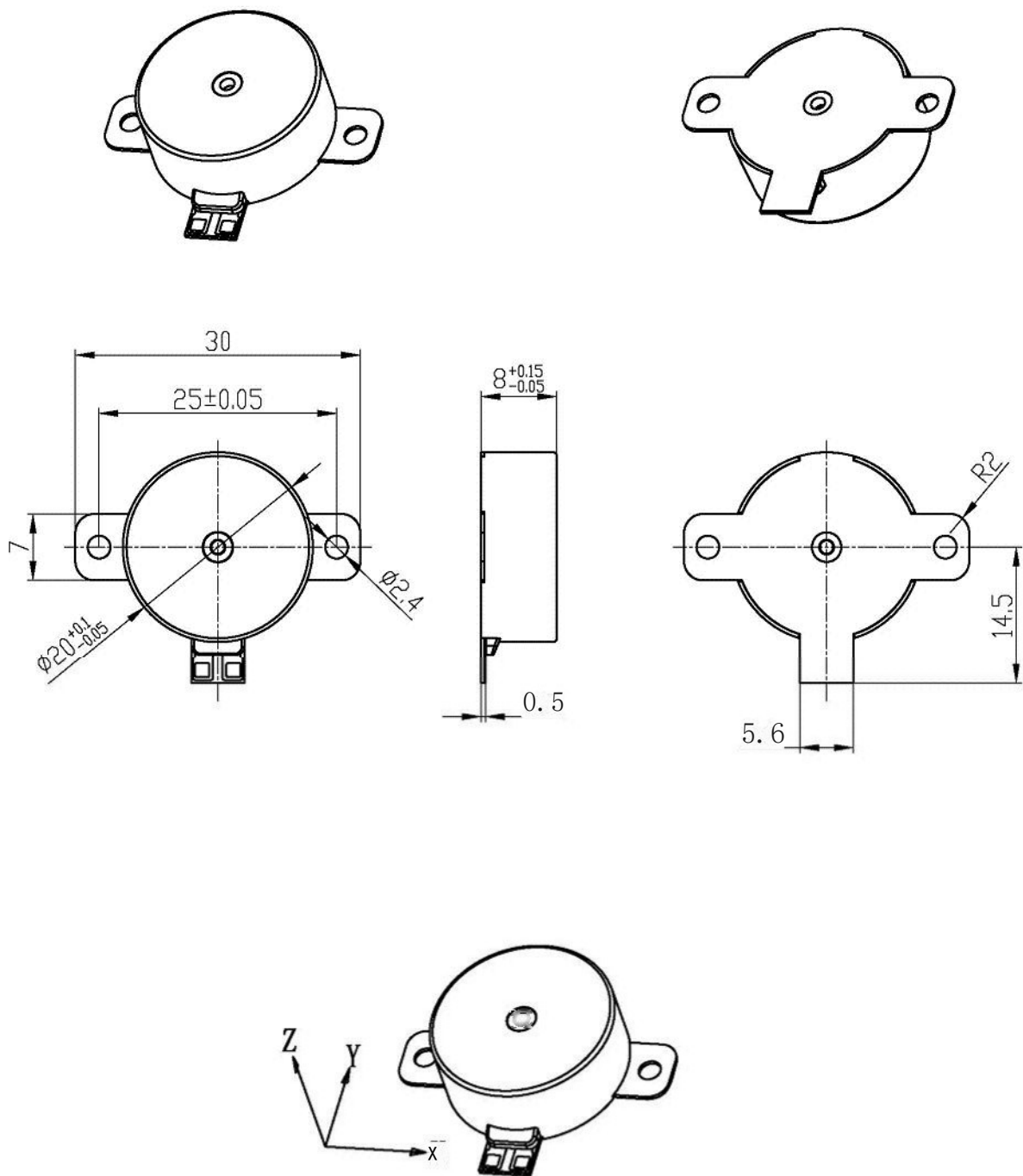
NO	Items(项目)	Standard test conditions(标准试验条件)	Judgment (判定)
6-1	Life test 寿命试验	Lock the vibrator on a test fixture (100g JIG) 振动器固定在 100g 的测试夹具上。 Temperature/温度: $85\pm 2^{\circ}\text{C}$ Humidity/湿度: $65\pm 20\%\text{RH}$ Sinewave 1.8Vrms, $f=175\text{Hz}$ 正弦交流电 1.8Vrms, 频率 150Hz Test model/试验形式: 0.5s ON 0.5s OFF Total times:2,000,000(约 555.6 小时/23.2Days)	After the test, vibrator shall be satisfy with specified in item 6-8 试验结束后, 振动器应满足 6-8 中规定的要求。
6-2	Low temp Storage 低温存放试验	Temperature (温度): $-40\pm 2^{\circ}\text{C}$ Test time (试验时间): 168hours	After the test, After 2 hours placed in ordinary temperature and humidity, vibrator shall be satisfy with specified in item 6-8 试验结束后, 在常温常湿中放置 2 小时后, 振动器应满足 6-8 中规定的要求
6-3	High temp Storage 高温存放试验	Temperature (温度): $120\pm 2^{\circ}\text{C}$ Test time (试验时间): 168 hours	
6-4	Heat shock 温度冲击	$-40^{\circ}\text{C}/+120^{\circ}\text{C}$ 2hours/cycle, 15cycles. transition time $\leq 5\text{minutes}$ 低温 -40°C , 高温 $+120^{\circ}\text{C}$, 2 小时切换, 15 个循环 切换时间间隔 ≤ 5 分钟	
6-5	Humidity storage 湿热存放试验	Temperature (温度): $50\pm 2^{\circ}\text{C}$ Humidity (湿度): 95%RH Test time (试验时间): 120hours	
6-6	Drop test 跌落试验	Dummy JIG 200g , drop to the granite floor. 治具 200g, 自由落体到花岗岩板上 Height/高度: 1.2m Direction/方向: 6 faces and 12 sides of the JIG . Times/次数:Each direction 1 drop, totaling 18 times. 每方向跌落 1 次, 共计 18 次	After the test, vibrator shall be satisfy with specified in item 6-8
6-7	Vibration Test 振动试验	JIG/治具: 160g Acceleration /加速度: 2.2G Sweep frequency /扫频: 10 ~ 55Hz/min Direction/方向: X、Y、Z axis Duration/持续时间: 10min in each direction	试验结束后, 振动器应满足 6-8 中规定的要求。
6-8	AFTER TEST REQUIREMENTS/试验后特性判定		
	1、Acceleration change rate within $\pm 30\%$ from initial./加速度变化在初始值的 $\pm 20\%$ 以内;		
	2、Resonant frequency(f_0) change rate within $\pm 10\%$ from initial./ 谐振频率 (f_0) 变化在初始值的 $\pm 10\%$ 以内;		
	3、Insulation resistance within $\pm 20\%$ from initial./绝缘电阻变化在初始值的 $\pm 20\%$ 内;		
	4、Terminal resistance within $\pm 20\%$ from initial./ 端子电阻变化在初始值的 $\pm 20\%$ 内;		
	5、There should be no abnormalities in appearance and structure.外观和结构应无异常;		

7. Outline drawing (外形图)

PRODUCT SPECIFICATION

Modle: TSL208-175S

Document NO.: 202230920-01



direction of vibration:

TSL208-175S

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8. Encoding rules 编码规则

To be determined according to customer's requirements

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Document NO.: 202230920-01

依据客户需求确定

9. Packaging requirements 包装要求

50 pcs per box, 5 boxes per bundle, 2 bundles per box, 500 total.

每盒 50PCS, 每捆 5 盒, 每箱 2 捆, 共 500PCS

10. Caution for Use 使用注意事项

10-1. Please use vibrator in the specification of this specification. Otherwise the service life and performance of the vibrator will be affected. 请在本规格书规范内使用振动器, 否则会影响振动器的使用寿命和性能。

10-2. Make arrangement to limit the storage period to 6 months or less. 请在 6 个月内使用。

10-3. please do not push the load of 15N or more on the surface of the vibrator, when exceeding 20N, it causes the trouble. 振动器表面承载压力不得超过 20 牛顿, 否则可能会导致功能故障。

10-4. Vibrators should be firmly fixed in the direction of vibration (Recommended Installation Force 5-8N), Otherwise it will be prone to noise. 振动器应牢牢固定在振动方向上 (推荐安装力 5-8N), 否则容易产生噪声。

10-5. Please lay the vibrators carefully in transportation to avoid any serious damage to the vibrator body or its electric function because of collision. 在运输过程中应小心轻放, 避免振动器碰撞受损

10-6. when soldering FPCB, The soldering iron temperature does not exceed 350 degrees and the soldering time per spot does not exceed 3 seconds. 焊接 FPCB 时, 电烙铁温度不超过 350°, 每个点焊接时间不超过 3 秒。

10-7. Vibrators can't be used in high temperature, High humidity and corrosive gas environment. 振动器不能在高温、高湿度和有腐蚀性气体环境中使用。

10-8. The vibrator has a strong magnet, So please be aware that it has a magnetic force on the surface of the bracket. 振动器有一个强的磁铁, 因此请注意, 它的支架表面有磁力。

10-9. Under the conditions of meeting this specification, our company can change the material, size and shape of parts to improve quality, performance or production efficiency. 在满足本规范的前提下, 我司可以改变零件材料、尺寸及形状来改善品质、性能或生产效率。

10-10. If there is any argument on vibrator performance and/or life, judgment is to be made base on this specification only. 如对振动器的性能和 (或) 寿命有任何争议, 仅基于此规格书作出判断。

10-11. In order to avoid mechanical noise caused by boosting impact, please set a clearance hole in the axial direction of the vibrator during installation, as shown in the following figure 为避免升压冲击时产生机械噪音, 安装时请在振动器的轴向设置让位孔, 参见下图

