



金龙机电股份有限公司
JINLONG MACHINERY & ELECTRONICS CO., LTD.

产品规格书
PRODUCT SPECIFICATION

客户名称/Customer	
客户料号/Part No.	
客户承认签章 Customer Approved Signatures	

品名/Description	Haptics Alert 触觉反馈模块	
型号/Part No.	GOT2	
设计/ Designed by Leon	审核/Verified by	批准/Approved by

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1.适用范围/Application

本说明书适用于触觉反馈模块 LVM-063131(GOT1)

This specification applies to Haptics Alert LVM-063131(GOT2)

2.结构/Configuration

序号 NO.	项目 Item	内容 Contents
2-1	外形尺寸 Structure	41.4mm×6mm×3.1mm (长×宽×高) 41.4mm×6mm×3.1mm (Length × Width × Height)
2-2	重量 Weight	4.45克 (约) 4.45g (Approx)

3.基本规格/Basic Specifications

序号 NO.	项目 Item	规格 Specification	条件/备注 Condition / Remark
3-1	操作驱动 Applied Voltage	8.0V (脉冲信号) 1.7-2Vrms (连续)	D级功率放大器 Class-D amplifier drive
3-2	额定电压 Average Power	375mW (脉冲信号) 80 mW (连续波信号)	
3-3	内阻 Internal Resistance	16±0.5Ω	
3-4	Insulation Resistance 绝缘阻值	1 MΩ	在端子和外壳之间通 100V DC 100V DC between terminal and housing
3-5	Operating conditions 使用环境	-10°C~40°C	常规湿度, 无水汽凝结 ordinary humidity ,no condensation of moisture
3-6	Storage conditions 贮存环境	-20°C~70°C	常规湿度, 无水汽凝结 ordinary humidity ,no condensation of moisture

4.性能/Performance

序号 NO.	项目 Item	规格 Specification	条件/备注 Condition / Remark
4-1	频率 Resonant frequency	180Hz~220Hz	参考TRAP2 Refer to trap2
4-2	动量T Internal Momentum of Tap	1150~1350 gm-mm/s	参考TRAP2 Refer to trap2
4-3	动量V Internal Momentum of Vibe	1000~1200 gm-mm/s	参考TRAP2 Refer to trap2
4-4	品质因素 Q Quality Factor	14~30	参考TRAP2 Refer to trap2
4-5	声压级T A-Weighted SPL of Tap	25 dBA ~60dBA	参考TRAP2 Refer to trap2
4-5	声压级V A-Weighted SPL of Vibe	25 dBA ~58dBA	参考TRAP2 Refer to trap2

序号 NO.	项目 Item	规格 Specification	条件/备注 Condition / Remark
4-6	P加速度 Peak Rattle Acceleration	>1.1Grms	参考TRAP2 Refer to trap2

5.性能测试条件/Test Conditions

序号 NO.	项目 Item	测试条件 Test Conditions
5-1	温度 Temperature	25±2°C
5-2	湿度 Humidity	65±20% RH
5-3	测试信号 Test signal	
5-4	测试方法 Test method	参考TRAP2 Refer to trap2

6.可靠性试验/Reliability Test

每项试验测试 16只产品，可靠性试验后，所有样品必须符合以下标准：

Test 16 pcs for each test. After reliability test, all sample must be meet the requirement as below:

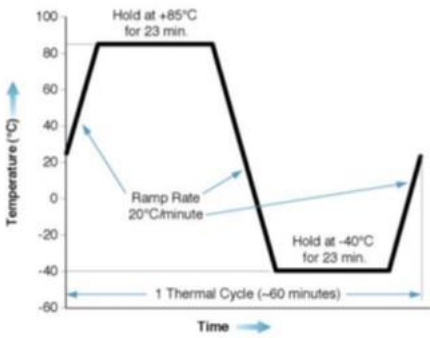
a)频率变化量在原始频率±5%以内/Resonant frequency: within±5% of original

b)反馈Q值≥10/TapCal Q-BackEMF :≥10

c)噪音/Noise:≤64dBA

备注：试验后，需常温下至少放置四小时后测试产品性能。

NOTE: Test the function after at least 4 hours exposure in ordinary temperature.

序号 NO.	项目 Item	测试条件 Test Conditions
6-1	常温寿命测试 Life test	以0.5秒开/0.5秒关的周期测试240个小时。 Testing 240hours while product is cycled at 0.5s on and 0.5s off
6-2	热循环 Thermal Cycling	从-40°C到85°C，循环240次，不控制湿度，每次循环 1个小时。细节如下所示： Cycle 240 times from -40°C to 85°C, uncontrolled RH. Each cycle is 1 hour. See details below: 
6-3	高温高湿试验 Non Operational Heat Soak	产品在测试过程中不通电。 The product should not be powered during the test. 在温度为85°C，相对湿度为85%的条件下，放置168小时。 168 hours non-operational heat soak at85°C/85%RH. 产品在测试过程中不通电。 The product should not be powered during the test.
6-5	跌落测试 Standard Drop test	使用规定的跌落夹具，以6面，4角的方式使产品固定，从1.5米高度落下，各2次。参照测试顺序，使用一个可调节高度的跌落仓，从距离花岗岩表面50厘米的托架上，放开夹具。产品在测试过程中不通电。 Drop from 1.5m in specified drop buck onto 6 face planes and 4 corners 2 times. Follow test order, use a controlled drop tower and release the buck from the guide carrier 50cm from the granite surface. The product should not be powered during the test.

注意：NOTE:

●跌落治具/Drop buck:

使用6000系列铝合金制成跌落治具，总重量为124±5 g(包括触觉反馈模块和装配螺钉)。

Drop buck should be made from 6000 series aluminum with a total mass of 124 ± 5g including the product and assembly screws.

●测试顺序/Test order :

- a)正面/Front Face
- b)背面/Rear Face
- c)左面/Left Face
- d)右面/Right Face
- e)上面/Top Face

- f)底部/Bottom Face
- g)右上角: 27±5度/Upper Right Corner: 27 ± 5 degrees
- h)左上角: 27±5度/Upper Left Corner: 27 ± 5 degrees
- i) 左下角: 27±5度/Lower Left Corner: 27 ± 5 degrees
- j) 右下角: 27±5度/Lower Right Corner: 27 ± 5 degrees

7.序列号/Serial Number

在产品的侧面激光打印序列号及其相应二维码,编码规则如下图
Printing SN code and 2D bar code at the side of vibrate, and the meaning of each value as below.

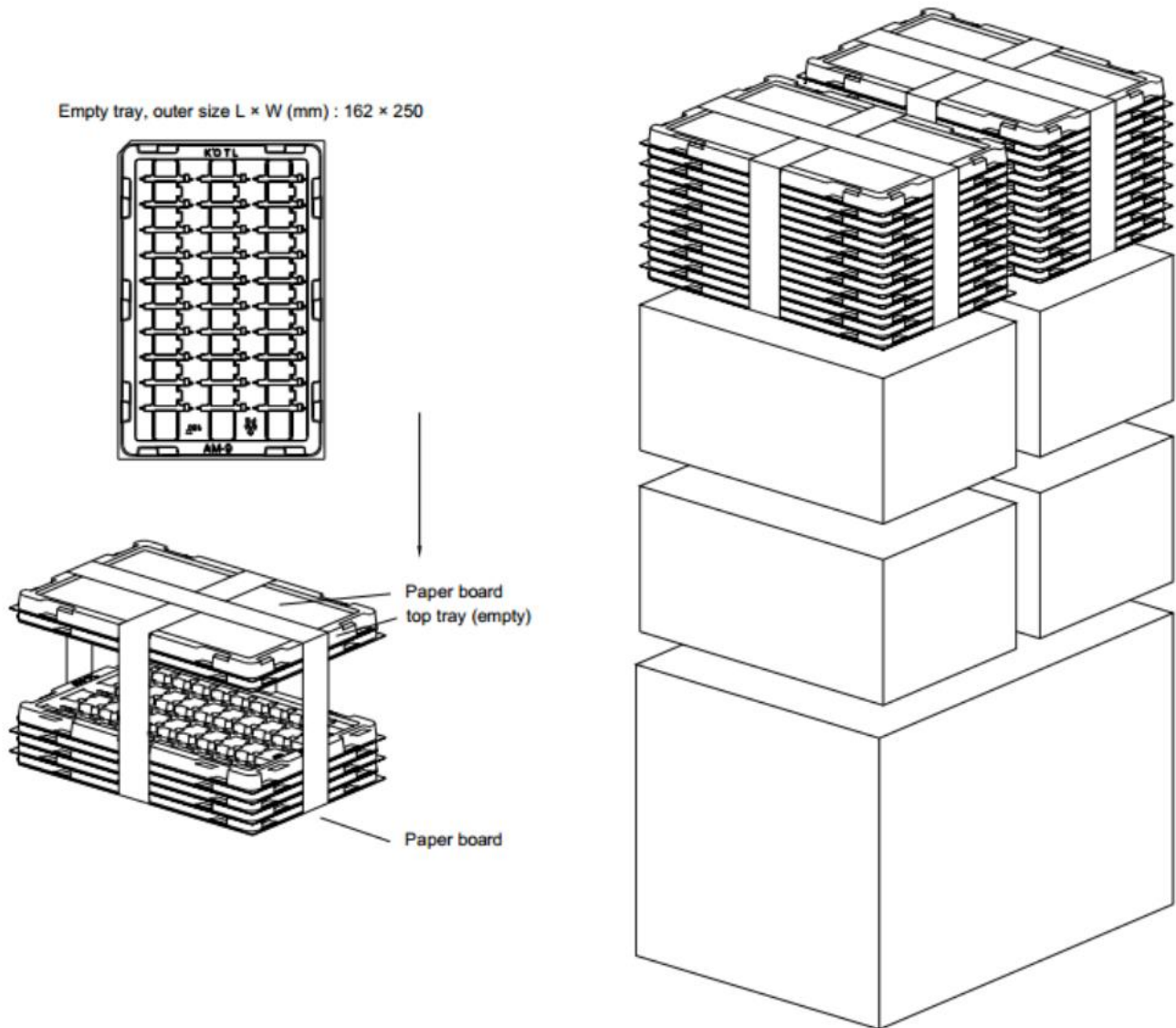


Code	Description	Format
PPP	Plant/ Vendor Factory Code	Alphanumeric
Y	Year Code	Numeric
WW	Week Code	Numeric
D	Day Code	Numeric
SSSS	Sequential count code	Alphanumeric
EEEE	Engineering Configuration Code	Alphanumeric
R	Revision	Alpha
X	Checksum character	Alphanumeric

8.外观图/Outline drawing

参考图纸/ Refer to MCO

9.包装/Packaging



10.注意事项/Cautions

1)使用范围/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触觉反馈模块，否则将相应降低触觉反馈模块的使用寿命和性能。

Pay attention to voltage and current ranges applied, and use the vibration product according to captioned specifications, or the product life and performance would be considerably reduced.

2)拿取触觉反馈模块/Move Haptics alert

拿触觉反馈模块时，应轻拿轻放，应尽可能地利用外壳部分
请勿将其跌落或加以超过5公斤的压力。否则会引起触觉反馈模块的外部形态和电气特性的改变

Please take the haptics alert gently by holding its case as possible.

Do not press the haptics alert with more than 0.5 kgf or drop it. Otherwise, haptics alert characteristics or external appearance could be affected.

触觉反馈模块在运输过程中应小心轻放，避免严重碰撞敲击引起的触觉反馈模块机身和性能受损。

Please lay the haptics alert carefully in transportation to avoid any damage to the haptics alert body or its characteristic caused by serious collision.

3) 储存/Storage

储存温度/Storage temperature: $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$

储存湿度/Storage relative humidity: 0%RH~95%RH

避免放置在高温、潮湿的环境中

Avoids storing under high temperature and high humidity

触觉反馈模块应适当的操作、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，在触觉反馈模块

的机械构造或装置中，如果存在腐蚀性气体，那么这会引引起触觉反馈模块不运转。

For proper operation, storage and operating environment must not contain corrosive gases such as H₂S, SO₂, NO₂, CL₂, etc. In addition storage environment must not have such emit corrosive gases as silicon, cyanic, formalin and phenol group. In the haptics alert mechanical structure or device, existence of corrosive gases may cause no rotation of haptics alert.

4) 使用触觉反馈模块/Attentions for Using Haptics alert

小心拿取、使用。

Take and use carefully.

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 place haptics alert on or near magnetic object or contact the surface, or it will affect the haptics alert performance.

避免触觉反馈模块叠放在一起。

Do not stack up haptics alert.

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 operating environment, especially magnet would absorb iron power and cause noise problem reducing service life.

请勿靠近磁体或有磁场的装置存放或运行触觉反馈模块。

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

请在6个月内使用，请不要在高温、低温、高湿环境下存储。在使用和打开触觉反馈模块外包装时请避

免水气凝结。

Make arrangement to limit the storage period within 6 months or less. Please do not store haptics alert in high and low temperature and high humidity. Condensation of atmosphere must be avoided in using or opening the package of the haptics alert.

5) 危险环境/Hazardous Environments

我司触觉反馈模块在正常环境中的抗腐蚀能力是符合要求的，但机壳上有少许区域存在的裸露金属对腐蚀比较敏感，因此未经咨询请不要在腐蚀环境中储存或使用触觉反馈模块。

The anti-corrosion of KOTL haptics alerts is qualified in normal environments. Otherwise the bare metal on the case is easily being corroded and please do not store or use haptics alert in corrosive environment without consultation with KOTL.

6) 请谨记/Attention

金龙机电股份有限公司拥有一支专业的技术支持团队，致力于解决我们的触觉反馈模块在新的产品或新的应用中出现的问题，我们乐意与您建立良好的合作关系，我们乐意为您解决使用中遇到的各种问题。

KOTL owns a professional technical team committing to solve the problems in new haptics alert products and new application. We are so glad to build good cooperation with you and always be ready to solve any problems you encounter in application.

————— END —————