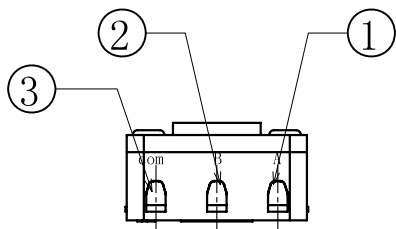
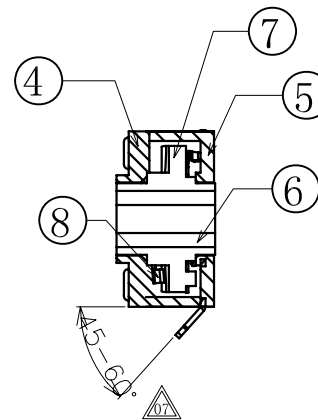
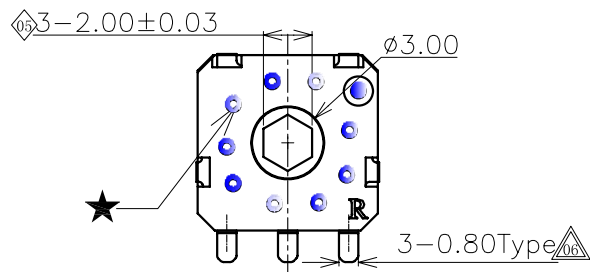
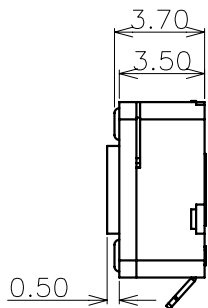
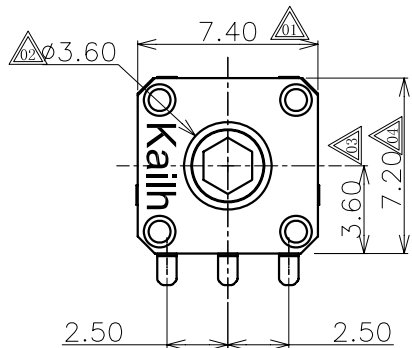


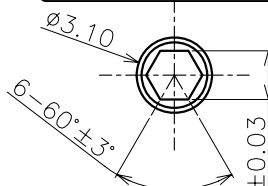
成品检验图纸



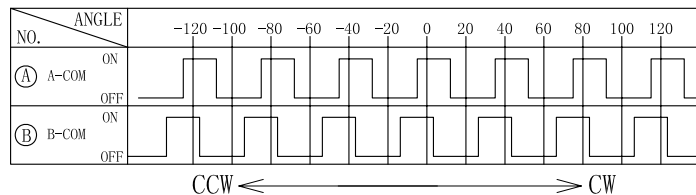
A: Output signal A
B: Output signal B

Shaft hole shape and dimension

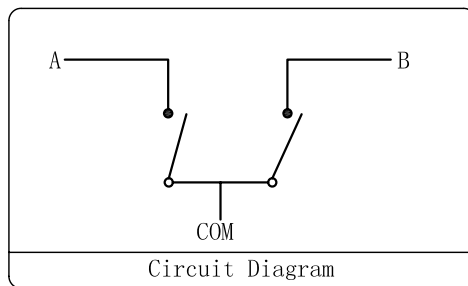
Shaft hole position will be at random



(Tolerance: ±0.1)
(P.C.B thickness t=1.6mm)



Numbers of detent: 18
Pulse/Rotation: 9 Pulse/360° (reverse)



备注:
底座背面的压针孔★是根据产品模具成型要求而定的,其规格的大小与数量的多少对产品结构、功能及使用无任何影响;

产品规格

- 1. 额定电压: D. C. 5V
- 2. 最大额定电流 (阻抗负载)
各导线 : 1mA
- 3. 分析能力: 每9个脉冲/360°
- 4. 接触电阻: 10Ω (最大)
- 5. 绝缘阻抗: 50MΩ (最小) DC50V
- 6. 耐电压: AC50V (50-60Hz) 持续1分钟
- 7. 卡点扭力矩: 10-25gf.cm
- 8. 寿命测试 : 100,000 Cycles (最小)

备注:

◇: 表示重点管控尺寸, 一般为功能尺寸, 首检及巡检时需量测。
△: 表示次重点管控尺寸, 一般为装配尺寸, 首检时需量测。
1) 重点及次重点管控尺寸中的序号不可重复, 需依次往后增加。若其中有某个尺寸在变更或其它状况下, 尺寸消失或不要求管控时, 原序号不可再用。有其它尺寸需要增加管控时, 序号往后增加。
2) 版次定义: 新开发而未转量产之产品图面版次为A1, A2, A3...
已转量产之产品图面版次为A, B, C...

序号	物料料号	零件名称	端子编号	用量	材料	镀层/颜色	备注
⑥	BWEN7236-03001	弹片		1	SUS301		
⑤	BSEN7236-05000	止动轮		1	POM	黑色	UL 94HB
④	BWEN7236-03000	簧片		1	磷铜 (C5210R-EH)		
③	BZEN7236-0200050	底座		1	PA66+30%GF	黑色	UL 94HB
②	BSEN7236-04002	3#盖板		1	PBT+15%GF	黑色	UL 94HB
①	BWEN7236-01001	端子	1 2 3	1	H65Y (0.2t)	镀银	

承认		日期	东莞市凯华电子有限公司	
设计	章辉军	2016.1.18	DONGGUAN CITY KAIHUA ELECTRONICS CO.,LTD	
审核			名称	EN7236编码器 (7.4*7.2*3.50)
核准			料号	CEN723609W10-NW
未注尺寸公差		角度	单位: mm	比例: 1:1
30 <1	±0.30	±2°	图号	KHA-EN7236-009
10 <1	±0.20		视角	1 OF 1
5 <1	±0.15			
1 <1	±0.10			

工程变更单号	版次	日期	NEW	说明	修改	审核	核准



P/N: CEN723609W10-NW	DOC. No.: KH-PS1801-37	Rev.: A	Page: 2/11
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Content

目录

1. Scope/范围:.....	3
2. Product Application/产品应用 :	3
3. Technology Parameters/技术参数	3
4. Ratings/额定性能要求.....	3
5. Profile Dimensions /外形尺寸.....	3
6. Electrical Performance/电气性能	4
7. Mechanical Performance/机械性能.....	6
8. Environmental Performance/环境性能.....	8
9. Packaging/包装.....	10
10. Precaution/注意事项	11



P/N: CEN723609W10-NW	DOC. No.: KH-PS1801-37	Rev.: A	Page: 3/11
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1. Scope/范围:

This Product Specification covers the requirement of Encoder switch on product performance, test methods and quality assurance provisions.

本规格书内容涵盖编码器产品的要求，包括性能指标、测试方法及质量保证方面等。

2. Product Application/产品应用:

The Switch is applied in all types of Computer mouse. Please let us know before using any of the products in the application not described above.

该编码器产品适用于所有类型的电脑鼠标，如果用于本文中未提及的领域请在使用前告知。

3. Technology Parameters/技术参数

Ambient Humidity 工作湿度:	$\leq 85\% \text{ R.H.};$
Operating Temperature Range 使用温度范围:	$-15^{\circ}\text{C} \sim +70^{\circ}\text{C};$
Storage Temperature Range 保存温度范围:	$-20^{\circ}\text{C} \sim +80^{\circ}\text{C};$
Normal Condition:	
Ambient temperature 环境温度:	$20 \pm 5^{\circ}\text{C}$
Relative humidity 相对湿度:	$85\% \pm 5\% \text{ R.H.};$
Air pressure 气压:	$86 \sim 101 \text{ KPa};$
Contact Resistance 接触阻抗:	$10 \Omega \text{ Max};$
Torque Force 扭矩:	$10 \sim 25 \text{ gf.cm};$
Solder Ability 可焊性:	$245 \pm 5^{\circ}\text{C}, 3 \pm 1 \text{ s};$
Withstand Soldering Temperature 耐焊接热:	$260 \pm 5^{\circ}\text{C}, 3 \pm 1 \text{ s};$
Pulse/Rotation 脉冲数	$9 \text{ Pulse}/360^{\circ}$
Numbers of detent 制动数	18

4. Ratings/额定性能要求

Rating 额定负荷: DC5V / 各导线	1mA;
Insulation Resistance 绝缘电阻:	$\geq 50 \text{ M}\Omega / \text{DC } 50 \text{ V};$
Withstand Voltage 耐电压:	50V AC 1 Minute;
Mechanical Life 机械寿命:	100,000 Cycles.

5. Profile Dimensions /外形尺寸

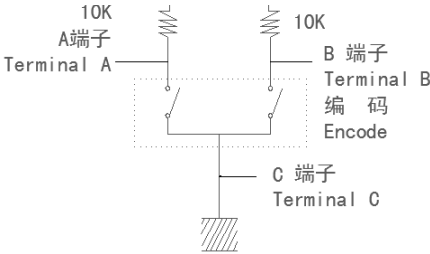
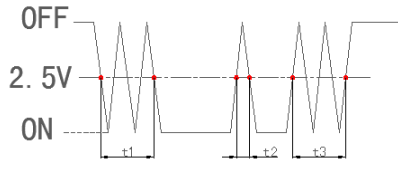
见成品图



6. Electrical Performance/电气性能

Item 项目	Description 项目描述	Test Condition 测试条件		Requirement 规格要求
6.1	Contact Resistance 接触电阻	Measured by a Voltage drop method at 1A ,5VDC.Any equipment with error not more than 5% can be used.Resistance after test in the averageof 5 successive measurements(To measure afteroperated 5 to 10 times) 以1A,5V直流电，采用误差不超过5%的仪器测量,实验后的电阻取5次测量的平均值。(转动5-10次测量)		10Ω Max 10Ω以下
6.2	Insulation Resistance 绝缘电阻	Apply a Voltage of DC 50 V for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 输入 50V DC 电压 1 分钟，按如下接触方法测试： (1) 端子与端子之间。 (2) 端子与外壳之间。		50MΩ Min 50 兆欧以上
6.3	输出信号 Output signal Format	Shaft rotational Derection 轴的回转方向	Signal 信号	Output 输出波形
		C.W 顺时针方向	A(A-C 端子间 A(TerminalA-C B(B-C 端子间) B(TerminalB-C	
		C.C.W 逆时针方向	A(A-C 端子间 A(TerminalA-C B(B-C 端子间) B(TerminalB-C	



Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
6.4	Resolution 分析能力	Number of pulses in 360° rotation 回转一周的输出脉动数	9 pulses/360° for each phase 每 9 个脉动/360°
6.5	Switching Characteristics 开关特性	<p>Measurement shall be made under the condition as follows. Shaft rotational speed :360° /S 下图所示回路，轴以360° /S的速度回转测定。</p>   <p>(NOTE) Code-ON area : The area which the voltage is 2.5V or less Code-OFF area : The area which the voltage is 2.5V or more (注) 编码器 ON 指输出电压2.5V以下的状态。 编码器 OFF 指输出电压2.5V以上的状态。</p>	
6.6	Chattering 振荡	Specified by the signal's passage time from 2.5V of each switching position(code OFF→ON 或 ON→OFF) 编码器 OFF→ON 或 ON→OFF 时，输出 2.5V 的通过时间应符合规定。	$t1.t3 \leq 3ms$
6.7	Bounce 突跳	Specified by the time of voltage change exceed 2.5V in code-ON area. When the bounce has code-ON time less than 1ms between chattering (t1 or t3), the voltage change shall be regarded as a part of chattering. When the code-ON time between 2 bounces is less than 1ms. They are regarded as 1 linked bounce. 编码 ON 部分的 2.5V 以上的电压变动时间在振荡 t1.t3 之间会产生 1ms 以上 2.5V 以下的 ON 部分，另外，如果各突跳间 2.5V 以下的范围在 1ms 以上时，则判定为另一个突跳。	$t2 \leq 2ms$

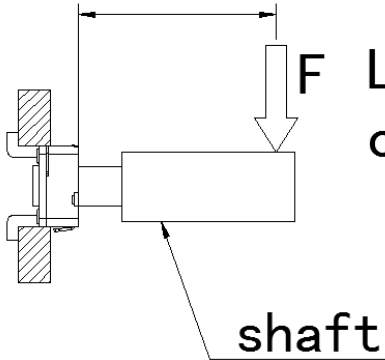


Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
6.8	Phase-Difference 相位差	<p>Measurement shaft be made under the Condition which the shaft is rotated in constant speed. 以固定的速度操作轴进行回转。(360/S)</p> <p>顺时针方向CW A信号 (A-C间) Signal A B信号 (B-C间) Signal B</p>	T1、T2、T3、T4 ≥ 5ms
6.9	Dielectric withstanding voltage 耐电压	<p>Apply a Voltage of AC 50 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body.</p> <p>输入 50V AC 电压 1 分钟, 按如下接触方法测试: (1) 端子与端子之间. (2) 端子与外壳之间.</p>	No evidence of breakdown 无瞬断、击穿等破坏

7. Mechanical Performance/机械性能

7.1	Detent torque 卡点扭力矩	<p>Account the test with the torque within the scope of at 5°C-35°C temperature. 在 5°C-35°C 温度范围内用扭力计测试</p>	10-25gf.cm
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Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
7.2	Number and position of detent 定位点数及位置	N/A 不应用	18 detents(Step angle: $20^{\circ} \pm 3^{\circ}$) 18 点定位 (间隔角度: $20^{\circ} \pm 3^{\circ}$)
7.3	Push-pull strength of shaft 轴的推拉强度	<p>Fixed the product to support and apply static force(F) of 50mN.m/5s as shown in the (fig5) 成品固定于支架上沿轴垂直方向施加 FXL=50mN.m/5s 荷重的压力。</p>  <p>Leaning operation</p>	<p>Without damage to or excessive play in shaft no excessive abnormality in rotational feeling. And electrical characteristics shall be satisfied 产品不得有明显松动及接触不良, 电气性能异常</p>
7.4	Rotational life 回转寿命	<p>The shaft of encoder shall be rotated to 100,000 cycles at a speed of 30 cycles per minute without electrical load after which measurements shall be made. 在无负荷条件下轴以 30 次/分钟的速度回转 100, 000 次。</p>	<p>Pleasedifference T1、T2、T3、T4 \geq 2.5ms Detent torque 10gf.cm(min) 相位差 T1、T2、T3、T4 \geq 2.5ms</p>



8. Environmental Performance/环境性能

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求															
8.1	Cold test 耐寒性	(1) Temperature : - 20±2℃ 温度: - 20±2℃ (2) Duration of test: 96h 持续时间: 96 小时 (3) Take off a drop water 去掉水珠 (4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance: 10Ω Max Shall meet : No. 6.1 to 6.9 No. 7.1 to 7.3 接触电阻 10Ω 以下 满足: No. 6.1 to 6.9 No. 7.1to 7.3															
8.2	Heat test 耐热性	(1) Temperature : 80±2℃ 温度: 80±2℃ (2) Duration of test: 96h 持续时间: 96 小时 (3) Take off a drop water 去掉水珠 (4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	Contact resistance: 10Ω Max Shall meet : No. 6.1 to 6.9 No. 7.1 to 7.3 接触电阻 10Ω 以下 满足: No. 6.1 to 6.9 No. 7.1to 7.3															
8.3	Temperature cycle 温度循环	(1) Test cycles: 5 cycles 试验周期: 5 个周期 (2) Standard condition after test:1h 试验后的放置条件: 1 小时 <table border="1" data-bbox="467 1361 1070 1554"> <thead> <tr> <th></th> <th>Temperature 温度</th> <th>Duration of test 持续时间</th> </tr> </thead> <tbody> <tr> <td>1 cycle 一次循环</td> <td>20±5℃</td> <td>1h</td> </tr> <tr> <td></td> <td>-20±2℃</td> <td>1h</td> </tr> <tr> <td></td> <td>20±5℃</td> <td>1h</td> </tr> <tr> <td></td> <td>80±5℃</td> <td>1h</td> </tr> </tbody> </table>		Temperature 温度	Duration of test 持续时间	1 cycle 一次循环	20±5℃	1h		-20±2℃	1h		20±5℃	1h		80±5℃	1h	Contact resistance: 10Ω Max Shall meet : No. 6.1 to 6.9 No. 7.1 to 7.3 接触电阻 10Ω 以下 满足: No. 6.1 to 6.9 No. 7.1to 7.3
	Temperature 温度	Duration of test 持续时间																
1 cycle 一次循环	20±5℃	1h																
	-20±2℃	1h																
	20±5℃	1h																
	80±5℃	1h																
8.4	Soldering heat test 耐焊接热	Soldering area: T/2 of PCB thickness. (PCB: T=1.6mm) 焊接面积: 印刷基板的 1/2 厚度处 Soldering temperature: 260±5℃ Soldering time: 3±1s 焊接温度: 260±5℃ 焊接时间: 3±1 秒	Appearance: No abnormality. 外观无异常															



Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
8.5	Solderability 可焊性	<p>1. Hand soldering 手工焊接: Please practice according to below condition: (1) Soldering Temperature : $350 \pm 5^{\circ}\text{C}$ 焊接温度: $350 \pm 5^{\circ}\text{C}$ (2) Continual soldering time: $3 \pm 1\text{s}$ 连续焊接时间: 3 ± 1 秒 (1) Capacity of soldering iron: $\leq 20\text{w}$ 电烙铁功率: 20 瓦以下</p> <p>2. Automatic PIP soldering 自动波峰焊接: For the product of T/H, according to below condition:</p>	<p>At least 95% of surface area of immersed portion shall be covered by solder. 侵焊面积大于 95%以上.</p>
8.6	Humidity test 耐湿性	<p>(1) Temperature : $60 \pm 2^{\circ}\text{C}$ 温度: $60 \pm 2^{\circ}\text{C}$ (2) relative humidity: 90~95% R.H. 相对湿度:90~95% R.H. (3) Duration of test: 96h 持续时间: 96 小时 (4) Take off a drop water 去掉水珠 (5) Standard conditions after test: 1h 试验后的放置条件: 1 小时</p>	<p>Contact resistance: 10Ω Max Shall meet : No. 6.1 to 6.9 No. 7.1 to 7.3 接触电阻 10Ω 以下 满足: No. 6.1 to 6.9 No. 7.1to 7.3</p>
8.7	Salt Spray 盐雾测试	<p>Apply the following environment to test: 根据下列条件进行测试:</p> <p>(1) Temperature : $35 \pm 5^{\circ}\text{C}$ 温度: $35 \pm 5^{\circ}\text{C}$; (2) Salt water density: $5 \pm 1\%$ 盐水浓度: $5 \pm 1\%$; (3) Duration: 24 hours 持续时间: 24 小时; (4) After test, the salt deposit shall be removed by running water. 实验后将盐沉积物用水冲掉</p>	<p>Appearance: No corrosion spot, no crack, no base plate naked. 外观: 无腐蚀点, 无裂纹, 无裸露基材.</p> <p>Contact Resistance: 10Ω Max 接触电阻: 10 欧以下</p>



凱華電子
KAIHUA EEELETRONICS

Product Specification

P/N: CEN723609W10-NW	DOC. No.: KH-PS1801-37	Rev.: A	Page: 11/11
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- (2) Please be careful not to stack up P. W. B. after switches were soldered.
开关焊接以后,印刷基板注意不要叠放.
- (3) Preservation under high temperature and high humidity or corrosive gas should be avoided
Especially. When you need to preserve for a long period, do not open the carton.
保管时尤其应注意避开高湿高温和有腐蚀性气体的环境.如需长时间保存,请不要打开包装箱.
- (4) Products meet the ROHS & REACH environmental management substances control standards
产品满足 **ROHS & REACH** 环境管理物质管制标准

“Confidential”

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