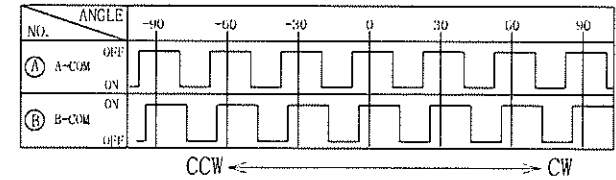
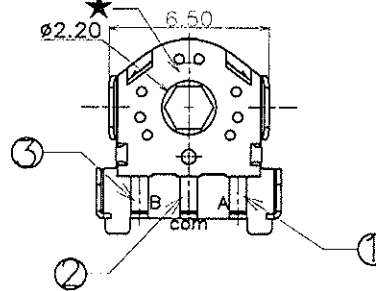
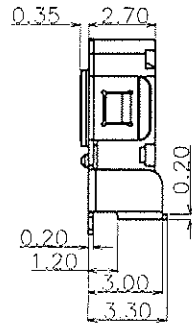
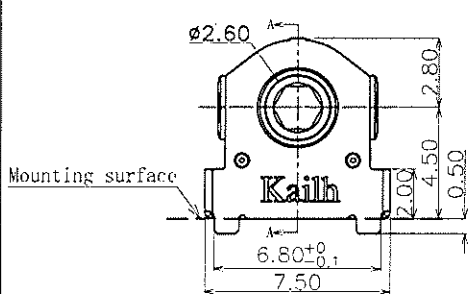
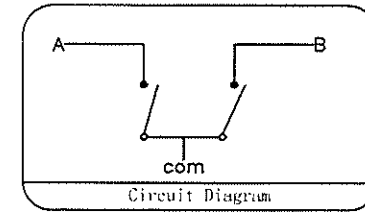
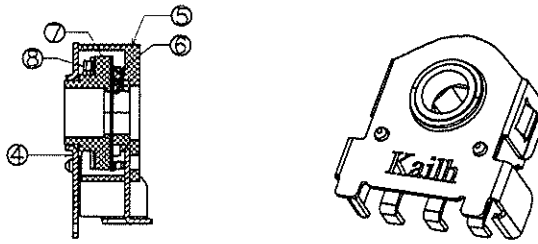
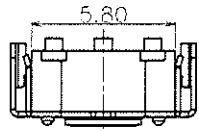
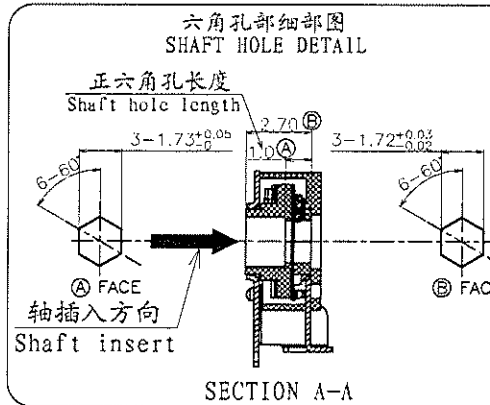
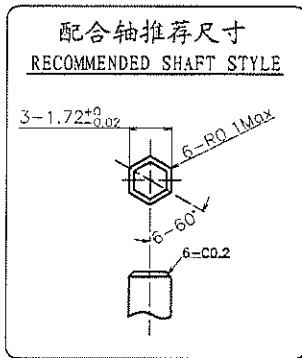
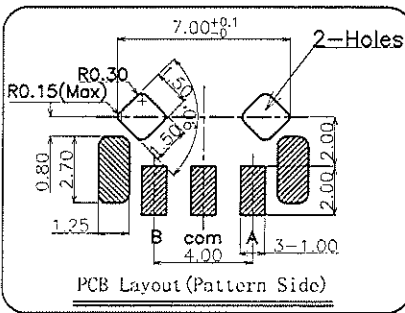
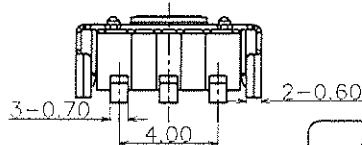


ABIDE BY ROHS



Numbers of detent: 12
Pulse/Rotation: 12 Pulse/360° (reverse)



■ Specification :

- 1. Rated voltage: D. C. 5V
- 2. Maximum operating current(resistive load) Each lead :1mA
- 3. Resolution: 12 pulses/360° for each phase
- 4. Contact Resistance: 10Ω (Max)
- 5. Insulation resistance: 50MΩ (Min) DC50V
- 6. Dielectric strength: AC50V (50-60Hz) for 1 minute
- 7. Detent torque: 10-30 gf.cm
- 8. Life Test :100,000 Cycles(min)

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。

Remark:

The pinholes on the back of the base is made according to product requirements to set the molding, its specifications and quantity of the number without any effect on the product structure, function and use.

ITEM	PART NAME	TER.NO.	QTY.	MATERIAL	FINISHING	REMARK
8	Fixed Plate	—	1	Stainless Steel	—	—
7	Revolving Wheel	—	1	NYLON	Black	UL 94HB
6	Contact	—	1	Phosphor bronze	—	—
5	Base	—	1	NYLON	Black	UL 94HB
4	Shell	—	1	Stainless Steel	Plating Silver	—
3	Terminal	3	1	Brass	Plating Silver	—
2	Terminal	2	1	Brass	Plating Silver	—
1	Terminal	1	1	Brass	Plating Silver	—

APPROVALS		DATE	东莞市凯华电子有限公司 DONGGUAN CITY KAIHUA ELECTRONICS CO.,LTD		
DRAWN	Wanwenxue	Mar.26.2011	TITLE:	Encoder (H=4.50mm/SMD)	
CHECKED			PART NO.	EN654512S02	
APPROVALS			UNIT: mm	SCALE: 1:1	PROJECT
TOLERANCES ARE		30-CL ±0.30 10-CL±0.20 3-CL±0.15 LES ±0.10	ANGLE	DRAWING NO.	SHEET 1 OF 1

ECN NO.	REV.	DATE.	NEW DESCRIPTION.	CHANGE.	CHECK.	APPRO.
	A0					



1. 一般事项 General

1-1 适用规格 Scope
本规格书适用于电子设备用微小电流回路05型回转式编码器。
This specification applies to 5mm size low-profile thin rotary encoder (incremental type) for microscopic current circuit used in electronic equipment.

1-2 标准状态 Standard atmospheric conditions
除另有规定外，测量应在以下状态下进行：
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and test is as follow limits:
温度： Ambient temperature : 5°C to 35°C
相对湿度： Relative humidity : 25% to 85%
气压： Air pressure : 86kpa to 106kpa

1-3 使用温度范围：
Operating temperature range : -5°C to +45°C

1-4 保存温度范围：
Storage temperature range : -15°C to +65°C

1-5 贮存期限：
Suggested storage period : about 6 months

2. 构造 construction

2-1 尺寸 Dimensions
见所附成品图 Refer to attached drawing

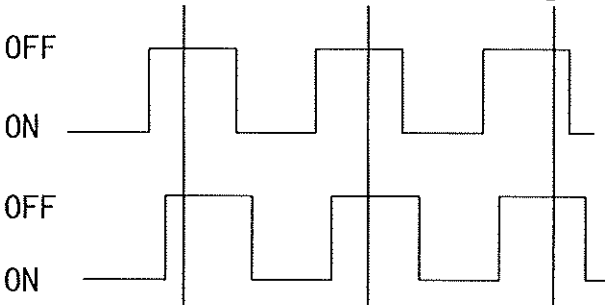
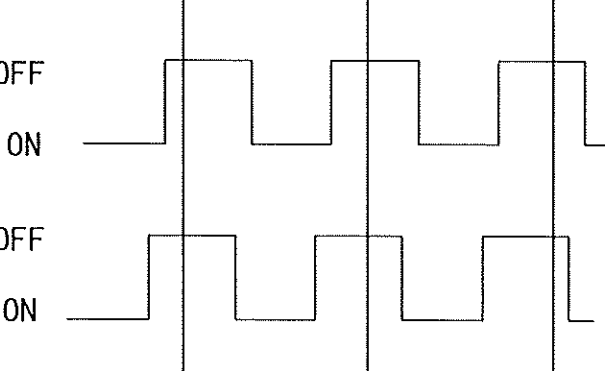
3. 额定值 Rating

3-1 额定电压：
Rated voltage : D. C. 5V

3-2 最大额定电流（阻抗负载）
Maximum operating current (resistive load)
各导线 Each lead : 1mA



4. 电气性能 Electrical characteristics

	项目 Item	条件 Conditions		规格 Specifications		
4-1	输出信号 Output signal format	轴的回转方向 Shaft rotational derection	信号 Signal	AB两个信号的相位差输出波形详见(图一)。附卡点时,卡点位置如下图所示(虚线表示带卡点装置的上擎子处位置) 2 phase-different signals (signal A signal B) Details shown in <fig. 1> (The brokenline shows detent position)		
				顺时针方向 C. W.	A (A-C端子间) A (Terminal A-C) B (B-C端子间) B (Terminal B-C)	输出波形 Output 
				逆时针方向 C. C. W.	A (A-C端子间) A (Terminal A-C) B (B-C端子间) B (Terminal B-C)	
4-2	分析能力 Resolution	回转一周的输出脉动数 Number of pulses in 360° rotation		每12个脉动/360° 12 pulses/360° for each phase		

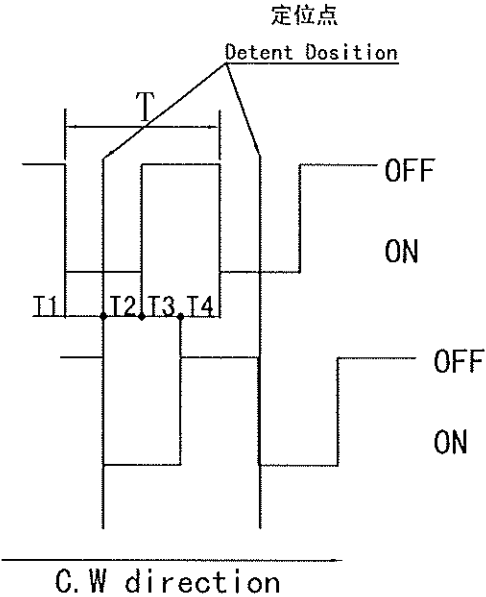


4. 电气性能 Electrical characteristics

	项目 Item	条件 Conditions	规格 Specifications
4-3	开关特性 Switching Characteristics	<p>下(图二)的所示回路,轴以$360^{\circ}/S$的速度回转测定。 Measurement shall be made under the condition as follows. 1) Shaft rotational speed :$360^{\circ}/S$ 2) Text circuit : <fig. 2></p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="395 689 965 1003"> <p>图二 <fig. 2></p> </div> <div data-bbox="1005 672 1500 952"> <p>图三 <fig. 3></p> </div> </div> <p>(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。 (NOTE) Code-ON area : The area which the vottage is 2.5V or less Code-OFF area : The area which the vottage is 2.5V or more</p>	
1)	振荡 Chattering	<p>编码器OFF→ON或ON→OFF时,输出2.5V 的通过时间应符合规定。 Specified by the signal's passage time from 2.5V of each switching position (code OFF→ON 或ON→OFF)</p>	$t1, t3 \leq 6 \text{ ms}$
2)	滑动声音 (突跳) Sliding noise (Bounce)	<p>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。 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.</p>	$t2 \leq 6 \text{ ms}$

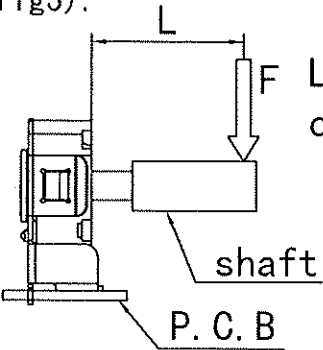


4. 电气性能 Electrical characteristics

	项目 Item	条件 Conditions	规格 Specifications
3)	滑动声音 Sliding noise	编码OFF部分的电压变动. The voltage change in code-OFF area.	2.5V 以上 2.5V MIN
4-4	相位差 Phase-difference	<p>以固定的速度操作轴进行回转. (360° /S) Measurement shaft be made under the condition which the shaft is rotated in constant speed.</p> <p>图四<fig. 4></p>  <p>图四<fig. 4> 展示了在顺时针方向(CW)操作轴时，信号A和信号B的时序。图中显示了定位点(Detent Position)和四个时间间隔T1、T2、T3、T4。信号A和信号B的波形在定位点处发生跳变，从OFF变为ON或从ON变为OFF。图中还标注了“C.W direction”。</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>	见 (图四) T1、T2、T3、T4 ≥ 3ms in<fig. 4>
4-5	耐电压 Dielectric strength	在端子和安装板间施加A.C. 50V电压1分钟. A voltage of 50 V.C. shaft be applies for 1min between individual terminals and bushing. (Lead current 1mA)	不得有绝缘破损 Without arcing or breakdown
4-6	绝缘阻抗 Insulation resistance	在端子和安装板间施加D.C. 50V Measurement shall be made under the condition which a voltage of 50V D.C. is applied between individual terminals and bushing.	端子安装板间电阻 50MΩ以上 Between individual terminals and bushing. 50MΩ MIN.
5. 机械性能 Mechanical characteristics			
5-1	全回转角度 Total rotational angle		360° (无止挡点) 360° (Endless)



5. 机械性能 Mechanical characteristics

	项目 Item	条件 Conditions	规格 Specifications
5-2	卡点扭力矩 Detent torque	在5°C-35°C温度范围内用扭力计测试。 Account the test with the torque within the scope of at 5°C-35°C temperature.	10-30gf. cm
5-3	定位点数及位置 Number and position of detent		12点定位 (间隔角度: 30° ± 3°) 12 detents (Step angle 30° ± 3°)
5-4	轴的推拉强度 Push-pull strength of shaft	制品焊接于P. C. B(图5) 沿轴垂直方向施加FXL=30mN. m/5s荷重的压力。 Mount the product to P. C. B and apply static force(F) of 50mN. m/5s as shown in the (fig5). 	端子不得有明显松动及接触不良, 电气性能异常。 Without damage to or excessive play in shaft no excessive abnormality in rotational feeling. And electrical characteristics shall be satisfied.
5-5	焊接耐热性 Resistance to soldering heat	在第七条的条件下 Specified by the clanse 7 "soldering conditions"	不得有绝缘体的破损、变形、接触异常。 Electrical characteristics shall be satisfied.No mechanical abnormality
5-6	Solderbility 可焊性	After sprated flux / 涂上助焊剂后 Temperature :245± 5°C / 温度: 245± 5°C Soldering time :2±0.5 sec/ 焊接时间:2±0.5 秒	70% or more of surface area of the portion immersed in solder shall be covered by new solder 70% 或更多的浸焊面能被焊锡覆盖。

6. 耐久性能 Endurance characteristics

6-1	回转寿命 Rotational life	在无负荷条件下轴以1200-2000/h速度回转100, 000周。 The shaft of encoder shall be rotated to 100,000 cycles at a speed of 1200-2000/h without electrical load after which measurements shall be made.	相位差T1、T2、T3、T4≥2ms 卡点出脱力10gf. cm(最小) Pleas difference T1、T2、T3、T4≥2ms Detent toraue 10gf. cm(min)
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5. 机械性能 Mechanical characteristics

	项目 Item	条件 Conditions	规格 Specifications															
6-2	耐湿性 Humidity test	1) 温度: $40 \pm 2^{\circ}\text{C}$ Temperature : $40 \pm 2^{\circ}\text{C}$ 2) 相对湿度: 90~95% relative humidity: 90~95% 3) 持续时间: 96 小时 Duration of test: 96h 4) 去掉水珠 Take off a drop water 5) 试验后的放置条件: 1 小时 Standard conditions after test : 1h	满足产品初始规格 4.1~4.6和5.1~5.5 Specifications in clause 4.1~4.6 and 5.1~5.5 shall be satisfied.															
6-3	耐热性 Heat test	1) 温度: $85 \pm 2^{\circ}\text{C}$ Temperature : $85 \pm 2^{\circ}\text{C}$ 2) 持续时间: 96 小时 Duration of test: 96h 3) 试验后的放置条件: 1 小时 Standard conditions after test : 1h	满足产品初始规格 4.1~4.6和5.1~5.5 Specifications in clause 4.1~4.6 and 5.1~5.5 shall be satisfied.															
6-4	耐寒性 Cold test	1) 温度: $-40 \pm 2^{\circ}\text{C}$ Temperature : $-40 \pm 2^{\circ}\text{C}$ 2) 持续时间: 96 小时 Duration of test: 96h 3) 去掉水珠 Take off a drop water 4) 试验后的放置条件: 1 小时 Standard conditions after test : 1h	满足产品初始规格 4.1~4.6和5.1~5.5 Specifications in clause 4.1~4.6 and 5.1~5.5 shall be satisfied.															
6-5	温度循环 Temperature cycle	1) 试验周期: 5 个周期 Test cycles :5 cycles 2) 试验后的放置条件: 1 小时 Standard condition after test :1h <table border="1" data-bbox="467 1451 1002 1742"> <thead> <tr> <th></th> <th>Temperature 温度</th> <th>Duration 放置时间</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>$-10 \pm 3^{\circ}\text{C}$</td> <td>30分钟 min</td> </tr> <tr> <td>2</td> <td>standard atmospheric conditions 常温</td> <td>10 to 15分钟 min</td> </tr> <tr> <td>3</td> <td>$70 \pm 2^{\circ}\text{C}$</td> <td>30分钟 min</td> </tr> <tr> <td>4</td> <td>standard atmospheric conditions 常温</td> <td>10 to 15分钟 min</td> </tr> </tbody> </table>		Temperature 温度	Duration 放置时间	1	$-10 \pm 3^{\circ}\text{C}$	30分钟 min	2	standard atmospheric conditions 常温	10 to 15分钟 min	3	$70 \pm 2^{\circ}\text{C}$	30分钟 min	4	standard atmospheric conditions 常温	10 to 15分钟 min	满足产品初始规格 4.1~4.6和5.1~5.5 Specifications in clause 4.1~4.6 and 5.1~5.5 shall be satisfied.
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4	standard atmospheric conditions 常温	10 to 15分钟 min																
6-6	盐雾实验 Salt Mist Test	试件在下述实验后测量: 1. 温度: $35 \pm 5^{\circ}\text{C}$ 2. 盐溶液浓度: $5 \pm 1\%$ (质量百分比), 3. 试验时间: 8小时, 4. 试验后, 将盐沉积物用水冲掉。 The switch shall be checked after following test: 1. Temperature: $35 \pm 5^{\circ}\text{C}$ 2. Salt solution: $5 \pm 1\%$ (Solids by mass) 3. Duration: 8 hours, 4. After immersing, salt deposit shall be removed by running water.	满足产品初始规格 4.1~4.6和5.1~5.5 Specifications in clause 4.1~4.6 and 5.1~5.5 shall be satisfied.															



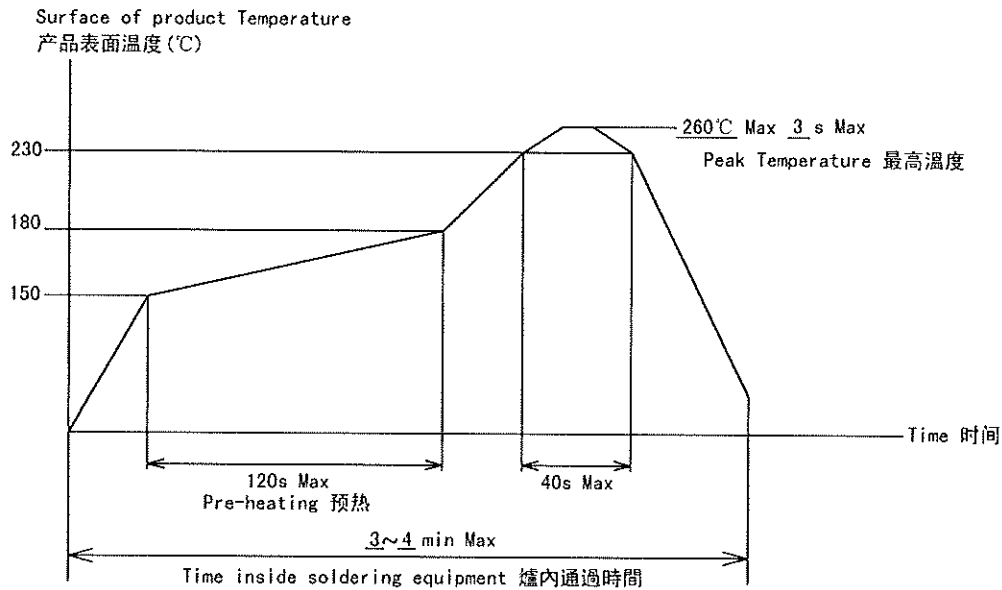
7. 焊接条件 Soldering conditions

7-1 回流焊接 Refluence Soldering

编码器在160°C条件下预热2分钟后再于260°C的回流焊炉中焊接.

Encoder shall be heat up at 160°C for 2 minutes,
then be soldered at 260°C

Temperature profile (Reference)



7-2 手工焊接 Manual soldering

温度350°C以下, 时间3秒以内。

Bit temperature of soldering iron : 350°C or less.

Application time of soldering iron : within 3s.

以上操作不得重复一次以上。

Apply the above soldering process for 1 times.