



CUSTOMER NAME	客户名称:	
CUSTOMER NO.	客户编号:	
SERIES	系 列:	编码开关/电位器XB-EC11
MODEL NO.	型 号:	XB-EC-1106S-D8-F6 series
DRAWING NO.	图 形 号:	ENCODER W/I SWITCH

若此产品规格符合贵司要求，敬请确认此规格书内所有项目
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依据和存档之用，多谢合作！

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Quality core! Afterburner for Made in China!

EC11(S)POSITIVE DIRECTION SERIES SPECIFICATION

EC11(S) 正向系列规格书

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11型薄型回转式编码器。

This specification applies to 11mm size low-profile thin rotary encoder (incremental type) for microscopic current circuits 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 following limits:

温度 Ambient temperature : 15℃ to 35℃

相对湿度 Relative humidity : 25 % to 85%

气压 Air pressure : 86KPa to 106 Kpa

1-3: 使用温度范围

Operating temperature range : -40±2℃ to +70 ℃

1-4: 保存温度范围

Storage temperature range : -40 ℃ to +85 ℃

图1 fig.1

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

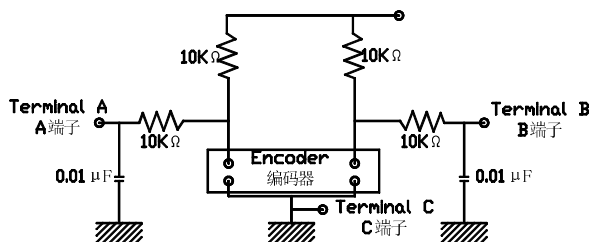
Rated voltage : DC. 5V

3-2: 最大额定电流（阻抗负载）

Maximum operating current (resistive load)

各相导线 Each lead: 0.5mA(Max 5mA;Min 0.5mA)

公共导线 Common lead: 1mA(Max 10mA;Min 1mA)



4. 使用注意事项 Application Notes

4-1: 不要在高温、多湿及腐蚀性气体环境中保管。

During operation storage in high temperature and in corrosive gas.should be avoided.

4-2: 对编码器脉冲数的处理、设计时, 要充分考虑速度、脉冲调制时间和杂音干扰等因素。

As design of the pulse count process. Care should be taken with operational speed.

4-3: 本制品在卡点上使A相在OFF 状态下比较安定,软件设计时以A相为标准

With this part detent positions we always be aligned with a-off phase. Therefore Make the a phase the reference at the soft ware design stage.

4-4: 编码器的脉冲数处理电路建议附加滤波电路（图1）。

The circuit of the pulsecount process should be adding filter as figure(fig.1).

4-5: 本制品本体若接触水分则对脉冲波形能产生异常影响,避免直接接触水分。

This product when touching wet or water can be influence the pulse wave.

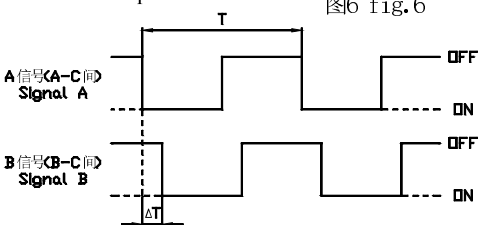
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项 目 Item		条 件 Conditions		规 格 Specifications	
5-1	输出信号 Output signal forma	AB两个信号的相位差输出波型详见Fig.2(3);虚线表示带卡点装置的上擎子处位置 2 phase-different signals (signal A,signal B)Details shown in fig.2(3);The broken line shows detent position			
		轴的回转方向 Shaft rotational direction	信号 signal	输出波型 Output	
				■ 15P (Fig.2)	20P (Fig.3)
		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)		
		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)					
5-2	分解能力 Resolution	回转360° 的输出脉冲数 Number of pulses in 360°rotation		■ 15个脉冲/360°(Fig.2) 15 pulses/360°for each phase	
				20个脉冲/360°(Fig.3) 20 pulses/360°for each phase	
5-3	开关特性 Switching Characteristics	下图Fig.4所示回路, 轴以360°/s的速度回转测定 Measurement shall be made under the condition as follows Shaft rotational speed: 360°/s Test circuit: Fig.4			
		图4 fig.4 图5 fig.5 (注)编码器 ON 指输出电压1.5V以下的状态。 Code-ON area :The area which the voltage is 1.5V or less(Fig.5) 编码器OFF指输出电压3.5V以上的状态。 Code-OFF area :The area which the voltage is 3.5V or more(Fig.5)			
5-3-1	振荡 Chattering	编码从OFF→ON或ON→OFF时,输出1.5V~3.5V 的通过时间应符合规定 Specified by the signal's passage time from 1.5V to 3.5V of each switching position(code OFF~ON or ON~OFF)		t1,t3 ≤ 3ms 带卡点时,在卡点位置上的B信号振荡 无规定 On the case within detent,B Signal will be irregular oscillation.	
5-3-2	滑动杂音 (突跳) Sliding noise (Bounce)	编码 ON 部份的1.5V以上的电压变动时间在振荡t1,t3之间会产生 1ms以上1.5 V以下的ON部份。另外, 如果各突跳1.5V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 1.5V 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.		t2 ≤ 2ms	

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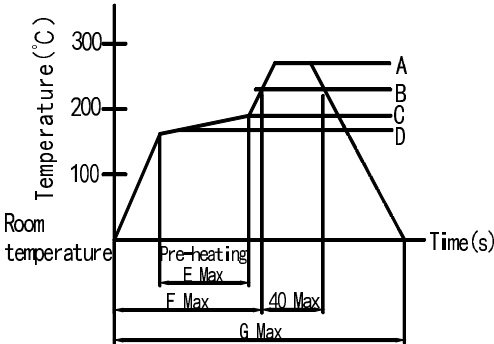
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5-3-3	滑动杂音 Sliding noise	编码OFF部份的电压变动 The voltage change in code-OFF area.	3.5V以上 3.5V Min
5-4	相位差 Phase difference	以固定的速度(360°/s)操作轴进行回转。 Measurement shaft be made under the condition which the shaft is rotated in constant speed.  图6 fig.6	见(Fig.6) in (Fig.6) Min $\Delta T=0.08T$
5-5	耐电压 Dielectric strength	在端子和轴套间施加AC.300V电压1分钟。 A voltage of 300VAC. shaft be applied for 1min between individual terminals and bushing.	不得有绝缘破坏 Without arcing or breakdown.
5-6	绝缘阻抗 Insulation resistance	在端子和轴套间施加DC.250V 1mA Measurement shaft be made under the condition which a voltage of 250V DC. is applied between individual terminals and bushing.	端子和轴间电阻100MΩ以上 Between individual terminals and bushing:100MΩ Min.
6. 机械性能 Mechanical characteristics			
6-1	全回转角度 Total rotational angle		360°(无止挡点) 360°(Endless)
6-2	卡点出脱力矩 Detent torque	只适用于附卡点装置 Only suitable for C.C. equipment.	3~20mN.m(30~200gf.cm)
6-3	定位点数及位置 Number and Position of detent	只适用于附卡点装置 Only suitable for C.C. equipment.	None (0) 无定位
6-4	轴的推拉强度 Push-pull strength of shaft	在轴端, 沿轴向施加80N(8kgf)的推力和拉力各10秒钟。 (在PCB焊锡后) Push and pull static load of 80N shall be applied to the shaft in the axial direction for 10s.(After installing)	轴不得有明显松动,电气性能无异常。 Shaft play in no excessive abnormality in rotational feeling. And electrical characteristics shaft be satisfied.
6-5	端子强度 Terminal strength	端子前端的任意方向施加5N(0.5Kgf)的静负荷力1分钟。 A static load of 5N shall be applied to the tip of terminals for 1 min in any direction.	端子不得有明显松动及接触不良,但允许变形。 Without excessive play in terminal or poor contact.
6-6	轴摆动 Shaft wobble	在轴前端5mm处, 沿径向瞬间施加5N (0.5 Kg)的力。 A momentary load of 5N shall be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft.	轴套长 (mm) 摆动(mmp-p less) Bushing length Wobble 5 0.3*L/20 7 0.25*L/20 10 0.2*L/20
6-7	轴的回转方向摆动 Shaft play in rotational wobble	用角度板测定 Testing by angle board.	5°以下 5°Max
6-8	轴套螺纹锁紧强度 Bushing nut Tightening strength		7.0kgf.cm以上 7.0kgf.cm Min
6-9	轴向间隙 Shaft play in axial direction	在轴上施加5N(50gf)的推力或拉力。 The pull / push load of 5N(50gf) shall be imposed on the shaft.	0.4mm 以下 0.4mm Max.

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7. 耐久性能 Endurance characteristics

项 目 Item		条 件 Conditions	规 格 Specifications														
7-1	回转寿命 Rotational life	在无负荷条件下轴以600~1000/h速度回转30,000周。 The shaft of encoder shall be rotated to 30,000 cycles at a speed of 600~1000/h without electrical load, after which measurements shall be made.	振荡: t1,t2≦3ms Chattering t1,t2≦3ms 卡点出脱力矩-30%~+10% Detent torque -30%~+10%														
7-2	耐湿性 Damp heat	温度40±2℃、湿度90~95%的恒温恒湿槽中放置240±10小时后，在常温、常湿中放置1.5小时后测试。 The encoder shall be stored at temperature of 40±2℃ with relative humidity of 90% to 95% for 240±10 in a thermostatic chamber .And then the encoder shall be subjected to standard atmospheric conditions for 1.5H. After which measurements shall be made.	应满足初期规格。 Specifications in clause														
7-3	耐热性 Dry heat	温度80±3℃的恒温箱中放置240±10小时，常温、常湿放置1.5小时后测量。 The encoder shall be stored at a temperature of 80±3℃ for 240±10H in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5H. After witch measurement shaft be made.	应满足初期规格。 Specifications in clause														
7-4	低温特性 Cold	温度-40±2℃的恒温箱中放置240±10小时，常温、常湿放置1.5小时后测量 The encoder shall be stored at a temperature of -40±2℃ for 240±10H in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5H. After witch measurement shaft be made.	应满足初期规格。 Specifications in clause														
7-5	预先加热 Preheat	预热: PBC板表面温度180±3℃以下，时间2分钟以内。 Preating must be finished within 2 minutes to reach Max.180±3℃ of copper foil surface after a PCB is placed a reflow soldering furnace.															
7-6	焊接加热 Soldering Heat	焊接温度260℃以下,仅允许时间3秒以内。 Soldering temperature is only allowed within 3s at Max.260℃ of copper foil surface after preheating. <table><tr><td>A(℃) 3s Max</td><td>B(℃)</td><td>C(℃)</td><td>D(℃)</td><td>E(s)</td><td>F(s)</td><td>G(s)</td></tr><tr><td>260</td><td>230</td><td>180</td><td>150</td><td>120</td><td>—</td><td>240</td></tr></table>	A(℃) 3s Max	B(℃)	C(℃)	D(℃)	E(s)	F(s)	G(s)	260	230	180	150	120	—	240	
A(℃) 3s Max	B(℃)	C(℃)	D(℃)	E(s)	F(s)	G(s)											
260	230	180	150	120	—	240											
7-7	允许焊锡过程次数 Allowable frequency of Soldering Process	2次以下 2 times max															

版本	变 更 记 录	日 期	承 办 Prepared By	审 核 Reviewed By	批 准 Approved By
			庞东	贺龙飞	高鹏