Switch Connector

标准&定制开关连接器产品制造商

DONG GUAN XI BANG ELECTRONICS CO., LTD.

规　　格　　书

SPECIFICATION

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-12S-H6-17 series
DRAWING NO.	图 形 号：	ENCODER W/I SWITCH

If specification of this product meets your request, please confirm all the items of it and return to us with signature and stamp, it will be basis of our production and record. Thanks your cooperation in advance!

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

并签名和盖章后回传给我司，以作我司产品制作之

依据和存档之用，多谢合作！

EXAMINE & APPROVAL 审批	
APPROVE 接受	NOT APPROVE 不接受
SIGNATURE 签署　　STAMP盖章　　DATE日期	

PREPARED BY.制表人	CHECKED BY.校对	APPROVED BY.审核	APPROVAL BY.批准
研发部 戴海明 2022.06.08	品质部 黄自清 2022.06.08	工程部 庞军 2022.06.08	总经办 吴量 2022.06.08

东莞市溪榜电子有限公司

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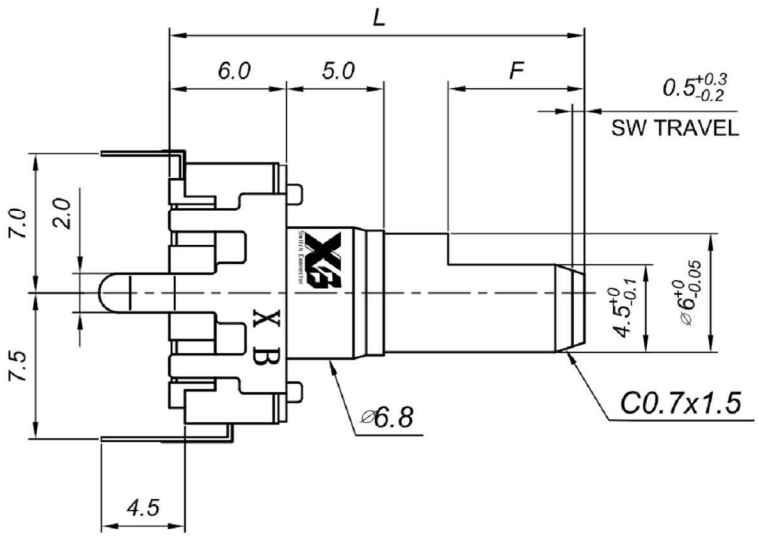
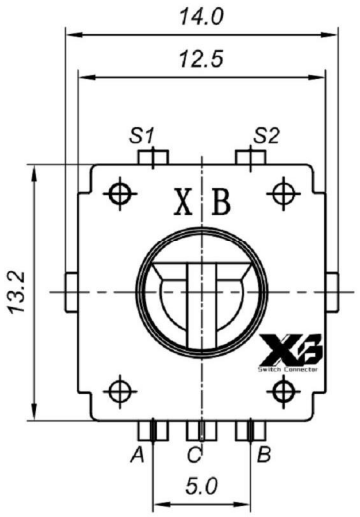
Quality core! Afterburner for Made in China!

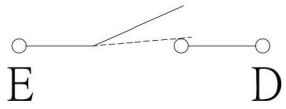
ROHS

DIMENSIONS





(SW02)CIRCUIT DIAGRAM

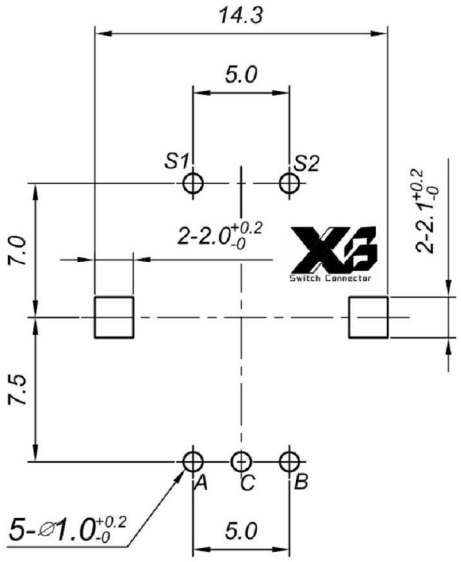


Shaft type

X	L	F
17.5F5.0	17.5	5.0
20F7.0	20	7.0
22.5F7.0	22.5	7.0
25F12	25	12
27.5F12	27.5	12
30F12	30	12

Pulse type

Y	C	PULSE
12C12P	12	12
24C24P	24	24
24C12P	24	12
24P	/	24
12P	/	12

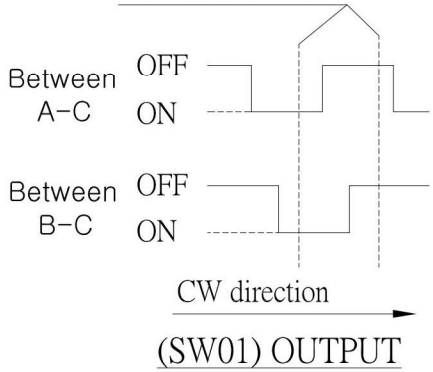


Mounting hole detail

(SW01) ENCODER

(SW02) PUSH ON SW

CLICK Position



(SW01) OUTPUT

SPECIFICATION (INITIAL)
RATING: DC 5V 0.5mA 10mA
ANGLE: FULL ROTATION ANGLE: 360 DEGREES
CONTACT RESIS TANCE: 100mΩ max
INSULATION RESISTANCE: 100MΩ DC 250V 1mA
WITHSTAND VOLTAGE: 300V AC/min or
OPERATION FORCE: 6±3N 600gf±300gf
SWITCHING LIFE: 20,000 cycles

ITEM NO.	DESCRIPTION	DRAWN	DATE
2	公差及料號更新	Jack	072313
1	圖面更新	Frank Wu	021012

东莞市溪榜电子有限公司
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TOLERANCE UNLESS OTHERWISE STATED: Up to 5 ±0.2; Above 5 ~ 15 ±0.3; Above 15 ~ 30 ±0.4; Above 30 ~ 50 ±0.5; Angle ±0.3°

3RD. ANGEL'S | UNITS MM

		DATE
DRAWN BY:	GAO PENG	07/23/13
CHECKED BY:	PANG DONG	07/23/13
APPROVED BY:	HE. LONG. FEI	07/23/13

MAT'L		TITLE	ENCODER
FINISH		MODLE	ENCODER W/I SWITCH
SCALE	1 : 1	DWG NO.	XB-EC-12S-H6-17.5F
SHEET NO.	1 of 1	PART NO.	

SIZE A4 | VER R2

EC11 SERIES SPECIFICATION　EC11系列规格书

1.一般事项General

1.1适用规格Scope

本规格适用于微小电流回路的电子设备,属12型回转编码器.

This specification applies to 12mm size low-profile rotary encoder(incremental type) for microscopic current circuits,used in electronic equipment

1.2标准状态Standard atmospheric conditions

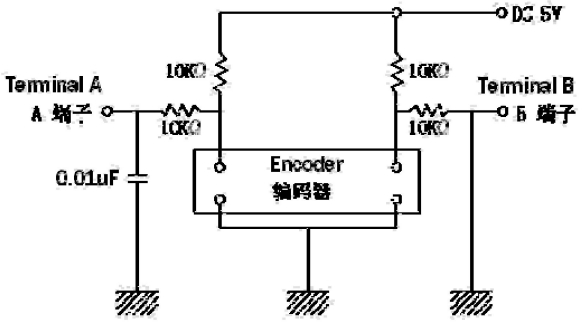
除另外有规定外,测量应在以上状态下进行:

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　106kpa



《图1》

1.3使用温度范围

Operating temperature range:　-10℃　to　70℃

1.4保存温度范围

Storage temperature range　:　-40℃　to　+85℃

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: ImA(MAX　10mA; MIN 0.5mA)

4.Application　Nots　使用上的事项

4.1避免储藏于高温、潮湿及腐蚀的场所,产品购入后尽可能在6个月内使用完.拆包装后未使用完的剩余产品需储存于防潮的环境下.

Avoid storing the products in a place at high temperature,high humidity and in Corrosive gases.Please use this product as soon as possible with 6 months limitation.If any rimainder left after packing is opened,please store it with proper moistureprooting,gasproofing etc.

4.2编码器信号的计算方法应将操作的速度,信号的取样时间及电子回路中的微电脑软体等考虑进去.

The encoder pulses count method should be designed with taking operating speed,sampling time and design of the microcomputer softwae into cosideration.

4.3此产品在定位点的输出阻抗波形参照(5-1),因此在设计软体时请留意其状态.

With this products the detent position output consnlt fig.5–1.Therefore make the A phase the reference at the soft ware design stage.

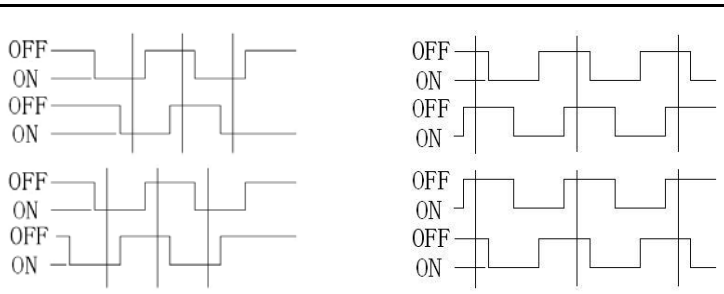
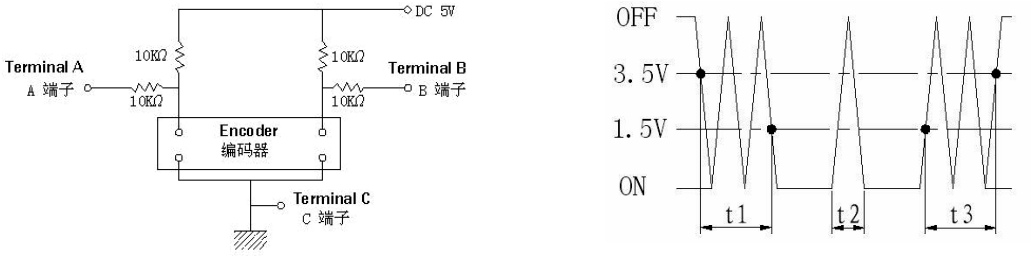
4.4在设计时要考虑到杂讯,建议使用C/R滤波电路(图1).

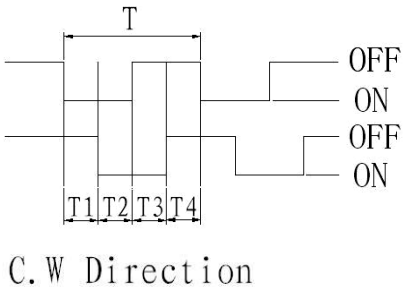
At design of the pulse count process.Using the C/R filter circuit is Recommended(fig.1).

4.5本产品请勿碰触到水,可能会导致输出波形的异常.

Care must be taken not to expose this product to water or dew to prevent possible problem in pluses output waveform

5.电气性能 ELECTRCAL CHARACTERISTICS

项目 ITEM	条件 CONDITIONS		规格 SPECICATIONS
5.1 输出信号 Output signal format	A、B两信号输出相位差,输出波形说细见(图2/3)(虚线表示带卡点位置的上擎子处位置) 2 phawe different signals(signal A,signal B)Details shown in(fig.2/3) (the broken line shows detent position.)		
	轴回转方向 Shaft rotati-onal direction	信号 Signal	输出波形 Output 图2 fig.2　　图3 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.		□12个脉冲/360°（图2) 12Pulses/360° fig2 for each phase ■24个脉冲/360°(图3) 24Pulses/360° fig2 for each phase
5.3开关特性 Switching characteristics	下(图4)所示回路,轴以360°/sec的速度转动测定. Measureent shall be made under the condition aw follows. Shaft rotational speed:360°/S　Test circuit:(fig.4) 图4(fig.4)　　图5(fig.5)  (注)编码OFF指输出电压3.5V以上的状态(fig.5).Code-OFF area:The area which the voltage is 3.5V or more(fig.5) 编码ON指输出电压1.5V以下的状态(fig.5).Code-ON area:The area which the voltage is 1.5V or less(fig.5)		
5.3.1振荡 Chattering	编码OFF→ON或ON→OFF时,输出1.5~3.5V 通过时间应符合规定. Specified by the signal' spassage time from 1.5V to 3.5V of each switching position(code OFF~ON or ON~OFF)		t1,t3≤5ms
5.3.2滑动杂音(突跳) Sliding noise (Bounce)	编码ON部分的1.5V以上的电压变动时间在振荡t1,t3之间会产生1ms以上,1.5V以下的ON部分另外,如果各突跳间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 tie sess than 1ms between chattering (t1 or t3).the voltage change shall be regarded aw a part of chattering. when the code-ON time between 2 bounces is less than 1ms.they are regarded as 1 linded bounce.		t2≤3ms

5.电气性能 ELECTRCAL CHARACTERISTICS		
项目 ITEM	条件 CONDITIONS	规格 SPECICATIONS
5.3.3滑动噪音 Sliding noise	编码OFF部份的电压变动. The voltage change in code-OFF area.	≥3.5V 3.5V min
5.4相位差 Phase difference	下(图6)所示回路,轴以360°/sec的速度转动测定. Measurement shall be made under the condetion which the shaft is rotated at 60r/min 图6 fig.6 A信号(A C)间 signal A B信号(B C)间 signalB 	T1、T2、T3、T4≥4ms 见图6(fig.6)
5.5绝缘阻抗 Insulation resistance	在端子和轴间施加电压250V DC. Measurement shall be made under the condition which a voltage of 250V DC is applied between individual terminals and bushing.	100MΩ以上 100MΩ Min
5.6耐电压 Dielectric strength	在端子和轴间施加AC 50V电压1分钟 A voltage of 50V AC shall be applied for 1 minute between individual terinals and bushing	不得有绝缘破坏 Without arcing or breakdown
5.7端子间接触阻抗 Contact resistance	编码讯号处于ON时安定状态条件下测定. Measurement shall be stalbe condition which a output signal is ON.	≤1Ω 1Ω Max
6.机械性能 Mechanical characteristics		
6.1全回转角度 Total rotational angle		360°(无止档点) 360°(Endless)
6.2定位点力拒 Deten torque	只适用于附卡点装置 Onlt suitable for C.C,equipment.	3~20mN.m(30~200gf.cm) Shaft rotatable at -10℃ +5℃ 但在-10℃ +5℃轴勉强可转动
6.3定位点数及位置 Number of detent and position	只适用于附卡点装置 Onlt suitable for C.C,equipment.	24detents(Step angle:15°±3°) ■24点定位(间隔角度15° ±3°)
		12detents(Step angle:30°±3°) □12点定位(间隔角度30° ±3°)
6.4轴的推拉强度 Push-pull strength of shaft	在轴端,沿轴向施加4.0Kg的静负荷推和拉各10秒钟(产品焊锡固定在PCB上). Push and pull static load of 4Kg shall be applied to be shaft in the axial deirection for 10s. (After soldering of the PC board)	轴无破损,回转无异常,电气性能无异常 Without damage or excessive play in shaft. NO excessive abnormality in rotational feeling. And.electrical characteristics and be satisfied.
6.5轴摆动 Shaft wobble	在轴前端5mm处,沿径向瞬间施加50mN.m(500gf.cm)的力. A momentary load of 50mN.m(500gf.cm)shall be applied at the point 5mm from the tip of the shaft in a derection perpendicular to the axis of shaft.	0.7xL/30mm p-p以下(L:指安装平面到轴的柄端的距离 0.7xl/30mm p-p Max或(l:Distance between mounting surface and measuing point on the shaft)

6.机械性能 Mechanical characteristics		
项目 ITEM	条件 CONDITIONS	规格 SPECICATIONS
6.6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
7.耐久性能 Endurance characteristics		
7.1回转寿命 Rotational life	在无负荷条件下轴以600周/小时速度回转30000周. The shaft of encoder shall be rotated to 30000 cycles at a speed of 600cycles/H without electrical load,after with easurements shall be made.	端子间接触阻抗200Ω以下. Contact resistance 200Ω MAX. 尚余有轻微定位感 Vibration t1,t3≤5mS振荡t1,t3≤5mS Bounce t2≤5mS突跳 t2≤5mS Detent feeling has to remains
7.2耐湿性 Damp heat	温度40±2℃,湿度90~95%的恒温恒湿槽中放置48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 48H in a thermostatic chaber.And the encoder shall be subjected to standard atmospheric conitions for 1.5H After which measurements shall be made.	所有项应满足初期规格 Specifications in clause all items is shall be satisfied.
7.3耐热性 Dry heat	温度80±3℃的恒温箱中放置48小时,然后在常温、常湿放置1.5小时后测试. The encoder shall be stored at temperature of 80±3℃ for 48H in a thermostatic chamber.And the encoder shall be subjected to standard atmospheric condetions for 1.5H,After which measurements shall be made	所有项应满足初期规格 Specifications in clause all items is shall be satisfied.
7.4低温特性 Cold	温度-25℃±3℃的恒温箱中放置48小时,常温、常湿放置1.5小时后测试. The encoder shall be stored at temperature of -25℃±3℃ for 48H in a thermostatic chamber.And the encoder shall be subjected to standard atmospheric condetions for 1.5H,After which measurements shall be made	所有项应满足初期规格 Specifications in clause all items is shall be satisfied.
7.5焊锡性 Solder ability	端子在235℃±5℃温度的焊锡槽内浸锡3±0.3秒. The terminals shall be imersed into solder bath at 235℃ for 3±0.3s in the same manner as para.	浸锡面积须有75%以上焊锡附着 A new uniform coating of solder shall cover 75% minimum of the surface being immersed.
7.6耐焊接热 Resistance to Soldering heat	手工焊接 Manual soldering 温度300℃以下,时间3秒以内. Bit temperature of soldering iron:300℃ less than application time of slodering iron:within 3s 槽焊 Dip soldering 使用基板:T=1.6㎜的单面覆铜板. Printed wiring board:single-stded copper clad laminate board with thickness of 1.6mm.	不得有绝缘体的破坏、变形、接触无异常. Electrical characteristics shall be satisfied No mechanical abnormality

7.耐久性能 Endurance characteristics		
项目 ITEM	条件 CONDITIONS	规格 SPECICATIONS
7.6耐焊接热 Resistance to Soldering heat	预热:基板表面温度100℃以下,时间1分钟以内. Preheating: 1.Surface teperature of board:100℃ or less 2.preheating time:within 1 min. 焊接:温度235±5℃或以下,时间3秒以内 Soldering:Soleer tempeature:235±5℃ or less Immersion time:within 3s	不得有绝缘体的破坏、变形、接触无异常. Electrical characteristics shall be satisfied No mechanical abnormality
推动开关部分 Push Switch Portion 备注:以下规格适用于EC12编码带开关系列. No:The following specification is only suitable for the one type with construction of EC11 encoder series.		
1.额定值 Rating		
1.1额定电压 Rated voltage: DC 5V 1.2最大额定电流(阻抗负载) Maximum operating current(resistive load):10mA MAX.		
2.电气性能 Electrical Characteristics		
项目 ITEM	条件 CONDITIONS	规格 SPECICATIONS
2.1接触电阻 Contact resistance	用DC 5V 10mA电压测定 Voltage test at DC 5V 10mA.	100mΩ or less ≤100mΩ
2.2绝缘阻抗 Insulation resistance	在端子和安装板间施加电压250V DC. Measurement shall be made under the condition which a voltage of 250V DC is applied between individual terminals and bushing and plank.	100MΩ以上 100MΩ Min
2.3振荡 Bouncing	以1秒钟1往返(OFF-ON-OFF)按压动作. Shaft shall be push at 1 cycles/s(OFF-ON-OFF).	10ms or less ≤10ms
2.4耐电压 Dielectric strength	在端子和安装板间施加AC50V 电压1分钟 A voltage of 50V AC shall be applied for 1 minute between individual terminals and bushing and plank.	不得有绝缘破坏 Without arcing or breakdown
3.机械性能 Mechanical characteristics		
3.1开关电路.接点数 Switch circuit and number of pulse		单极单投(按压ON) Single pole and single throw (PUSH ON)
3.2开关动作力 Operation fore of switch	在轴端,沿轴向施加的按压力. Push static load to the shaft in the axial direction	200~800gf.cm
3.3开关动移动量 Travel of switch		0.5±0.3mm
4.耐久性能 Endurance Characteristics		
按压寿命 Push life	The shaft of encoder shall be push to 20000 cycles at a speed of 600 cycles/H without electrical load,after with measurements shall be made. 在无负荷条件下轴以600次/小时速度按压往返20000周.	接触电阻:≤200mΩ 其它应满足初期规格. Contact resistance:200mΩ or less