



东莞市雅弧电子有限公司 DONGGUAN YAHU ELECTRONICS CO., LTD		文件编号 FILE NO.	SPECBM003	页码 PAGE	1/7
		发布日期 DATE OF ISSUE	2011 年 03 月 21 日		
PRODUCT SPECIFICATION 产品承认书		文件版本 EDITION	第 A 版 第 0 次修订		
名稱 TITLE	Mini 型 编码器	产品料号 PART NO.	EC062-4H-12C12P		

1. General Characteristics 一般特性:

Applicating: This Specification is applied rotary encoder used for general application.

适用范围: 该承认书适用于旋转编码器开关的一般使用范围.

Operating Temperature Range: $-25^{\circ}\text{C} \sim +85^{\circ}\text{C}$

使用温度范围: $-25^{\circ}\text{C} \sim +85^{\circ}\text{C}$

1.3 Operating Relative Humidity: $\leq 85\% \text{ RH}$

相对湿度: $\leq 85\% \text{ RH}$

Test Conditions: Unless ktherwise specified, the atmospheric conditions for making measurements and tests are as follows:

实验条件: 若没有特别说明, 测试大气条件如下:

Environment Temperature: $5 \sim 35^{\circ}\text{C}$

环境温度: $5 \sim 35^{\circ}\text{C}$

Relative Humidity: $45 \sim 85\%$

相对湿度: $45 \sim 85\%$

Atmospheric Pressure: $86 \sim 106\text{Kpa}$ ($860 \sim 1060\text{mbar}$)

大气压力: $86 \sim 106\text{Kpa}$ ($860 \sim 1060\text{mbar}$)

2. Appearance, structure and Dimensions 外观, 结构尺寸:

2.1 Appearance The encoder shall have good finishing, and no rust, crack or plating defects.

外观: 产品外观良好, 无锈蚀, 裂纹和镀层缺陷.

2.2 Structure & Dimensions Refer to individual product drawing.

结构及尺寸: 参见产品图纸

2.3 Markings Refer to individual product drawing.

标识: 参见产品图纸.

3. Ratings 额定负荷

Rotational: 50mA 5V DC

4. Electrical Characteristics 电气特性

NO.	Item 项目	Criteria 标准	Test Method 实验方法
4.1	Contact Resistance 接触电阻	$500\text{m}\Omega$ Max	Measured by a voltage drop method at ImA Max , 5VDC. Any equipment with error not more than 5% can be used. Resistance after test in the average of 5 successive measurements (To measure after operated 5 to 10 times) 以 1mA, 5V 直流电, 采用电压降法测量。也可用误差不超过 5% 的仪表进行测量, 实验后的电阻取 5 次测量的平均值。(按动 5-10 次后测量)
4.2	Insulation Resistance 绝缘电阻	$50\text{M}\Omega$ Min	50V DC voltage is applied between each pair of terminals between the terminal and the metal frame for $60 \pm 5\text{S}$ 在相互绝缘的所有端子之间及各接线端子与外露的非载流金属零件之间加载 50V 直流电, 持续时间 $60 \pm 5\text{S}$
4.3	Dielectric Voltage 抗电强度	No dielectric breakdown shall occur 无击穿现象发生。	50V AC (50~60Hz, cut-off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for $60 \pm 5\text{S}$ 在相互绝缘的所有接线端子之间及各接线端子与外壳或非载流金属零件之间加载 50V (50~60Hz) 交流电, 持续时间 $60 \pm 5\text{S}$



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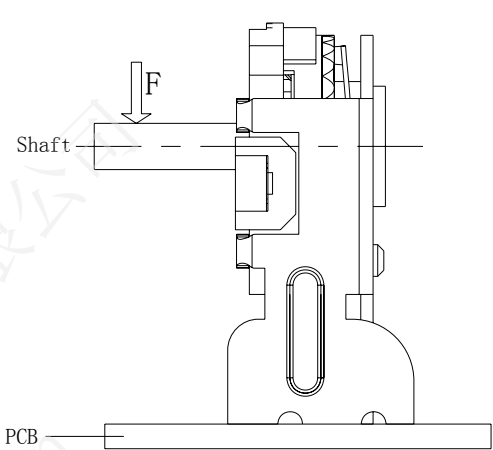
4.4	Output Signal Format 输出信号			2 Phase-different signals (aignalA, signalB)Derails shown in(The broken line shows detent position) A. B 两信号输出相位差, 输出波形详细见图, 卡点位置如下图所示(虚线表示带卡点装置的上擎子处位置)
		Shaft rotational direction 转回转方向	Signal 信号	Output 输出波形
		C. W. 顺时针方向	A (A~C 端子间) A(Terminal A~C)	
			B (B~C 端子间) B(Terminal B~C)	
		C. C. W. 逆时针方向	A (A~C 端子间) A(Terminal A~C)	
			B (B~C 端子间) B(Terminal B~C)	
4.5	Bouncing 切换特性	Between 3.5V and 1.5V Measurement circuit Diagram 1 Measure condition:360° /S for rotational speed t1.t3:3ms Max t2:2ms Max T1.T2.T3:5ms Min		Diagram 1 R1=R2=R3=R4=10K Ω C1=C2=0.01u Diagram 2



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5.Mechanical Characteristics 机械特性			
NO.	Ltem 项目	Criteria 标准	Test Method 实验方法
5.1	Detent points 执子点数与位置	12detent points each detent angle:30° ±3° 12 点执子每点角度: 30° ±3.	/
5.2	Output resolution 分解能	12pulse/360° 各相 12 脉波 360°	/
5.3	Rotational force 旋转力矩	14-26gf. cm	Apply a tension meter on the midpoint of the actuator(or tip of the shaft)to supply a pressure vertically from its free position to operating position. 在操作元件末端沿操作方向均匀施加静载荷,使操作元件转换到动作位置。
5. 4	Shaft play in axial direction 轴向摆动	0.3mm Max	Push and pull static load of 3N shall be applied to the shaft in axis directions. 沿轴向对元件施加 3N 的力
5.5	Terminal Strength 端子强度	Shall be free from terminal looseness,damage and insulator breakage The electrical performance requirements specified in section 4.1-4.5 shall be satisfied. 端子无松动, 损坏及绝缘层的 破裂。电气性能应符合第 4.1-4.5 条的要求。	A static load of 3N shall be applied to the tip of terminals for 10s in any direcion 任意方向施加 3N 作用力于接线端末端, 持续时间 10s
5.6	Vibration Proof 振动	After test, Contact resistance:5 Ω max. Insulation resistance:10M Ω Min. The electrical performance Specified in item 4.3-4.5 shall be satisfied. No abnormalities shall be recognized in appearance and construction 实验后: 接触电阻: 5 Ω max. 绝缘电阻: 10M Ω Min. 电气性能应符合第 4.3-4.5 条 的要求。 表面及结构无明显变形。	Encoder shall be secured to a testing machine by a normal mounting device and method. Encoder shall be tested according to the following request: (1) Vibration frequency range=10~55Hz (2) Total amplitude =1.5mm (3) Sweep ratio:10~55~10HZ Approx. 1min (4) Method of changing the sweep vibration frequency:linear (5) Direction of vibration:Three perpendicular directions including actuating direction. 编码器采用常规的安装方式牢固地安装在试验设备上, 并在下述参数条件 下进行试验: (1) 振频=10~55Hz (2) 振幅 1.5mm (3) 振动变化速率: 10-55-10HZ 大约 1 分钟 (4) 变频方法: 线性型式 (5) 振动方向: 三个相互垂直的方向, 其中一个方向是促动无件运 动的方向。 (6) 时间: 每个方向 2 小时 (共 6 小时)

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5.7	Mechanical Shock 冲击	After test Contact resistance: 5 Ω max. Insulation resistance: 10MΩ Min. The Electrical performance requirements specified in item 4.3-4.5 shall be satisfied. Shall be free from mechanical abnormalities. 实验后: 接触电阻: 5 Ω max. 绝缘电阻: 10MΩ Min. 电气性能应符合第 4.3-4.5 条的要求。 表面无变形且操作无异常。	Mount the product to P.C.B and apply static force of 10gf.cm Min. Second shown in the “F” 试件焊接于 P.C.B 施加静载荷 10gf.cm .min 
5.8	Solder Ability 可焊性	More than 90% of immersed part shall be covered with solder. 超过 90%的浸锡面积被焊料所覆盖.	Encoder shall be tested according to the following request: (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature:230$\pm$5°C Immersing Time:3$\pm$0.5s Flux immersing time shall be at 5-10s in normal room temperature. (4) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 编码器在下述参数条件下进行试验: (1)焊料:常规 (2)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液 (3)焊接温度: 230$\pm$5°C 浸渍时间: 3$\pm$0.5s 焊剂浸渍时间:5-10s (4)浸渍深度:接线端应浸到离开根部 1.6mm 处.



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5.9	Solder Heat Resistance 耐焊接热	NO abnormalities shall be observed in appearance and operation 无外观及功能损坏	Encoder shall be tested according to the following request: (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solid s by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature & Immersing Time Dip soldering: 230±5℃ 5±1s Manual soldering: 350±10℃ 2-3s (4)Immersion depth: (For Dip Soldering) immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 编码器在下述参数条件下进行试验: (1)焊料:常规 (2)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液 (3)焊接温度及浸渍时间: 自动焊接: 230±5℃ 5±1s 手工焊接:350±10℃ 2-3s (4)浸渍深度: (对于手动焊接) 接线端应浸到离开根部 1.6mm 处.
	Resistance to Flux 抗焊剂能力	Flux shall not be risen up tk contact. The encoder shall be free from abnormalities in operation. 焊剂不得上升进入编码器内部,影响接触转换. 试件在操作过程中不应发生变形.	Encoder shall be tested according to the following request: (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solid s by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature:230±5℃ Immersing Time:3±0.5s Flux immersing time shall be at 5-10s in normal room temperature. (4) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 编码器在下述参数条件下进行试验: (1)焊料:常规 (2)焊剂:焊剂质量百分比为 25%松,75% 的无色透明溶液 (3)焊接温度: 230±5℃ 浸渍时间: 3±0.5s 焊剂浸渍时间:5-10s (4)浸渍深度:接线端应浸到离开根部 1.6mm 处.



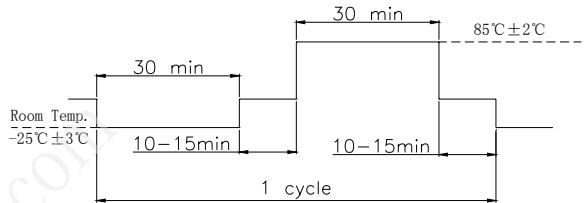
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6. Durability characteristics			
NO	Ltem 项目	Criteria 标准	Test Method 实验方法
6.1	Mechanical life 机械寿命	After test, Contact resistance: 5 Ω max. Insulation resistance: 10M Ω Min. The electrical performance requirements specified in item 4.3-4.5 shall be satisfied. 实验后: 接触电阻: 5 Ω max. 绝缘电阻: 10M Ω Min. 电气性能应符合第 4.3-4.5 条的要求。	200,000 cycles of operation shall be performed continuously at a rate of 30 cycles per minute without load. 在不带负荷的条件下,速度为 30 次/分,在寿命试验设备上连续转换 200,000 次。
6.2	Electronics life 电气寿命	After test, Contact resistance: 5 Ω max. Insulation resistance: 10M Ω Min. The electrical performance requirements specified in item 4.3-4.5 shall be satisfied. 实验后: 接触电阻: 5 Ω max. 绝缘电阻: 10M Ω Min. 电气性能应符合第 4.3-4.5 条的要求。	200,000 cycles of operation shall be performed continuously at a rate of 30 cycles per minute load as follow 50mA 5VDC 在带负荷的条件下,速度为 30 次/分,在寿命试验设备上连续转换 200,000 次。 50mA 5VDC

7.Weather Proof Characteristics 耐候性能:			
7.1	Cold Proof 低温	After test, Contact resistance: 5 Ω max.	After testing at -25 $\pm$ 2 $^{\circ}$ C for 96 hours, the encoder shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that.Water drops shall be eliminated. 试件在-25 $\pm$ 2 $^{\circ}$ C的温控箱内保持 96 小时,然后在正常温度和湿度下恢复 1 小时,并在此后 1 小时内对试品进行测量,水滴应消失。
7.2	Hot Proof 高温	Insulation resistance: 10M Ω Min. The Electrical performance requirements specified in item 4.3-4.5 shall be satisfied. 实验后:	After testing at 85 $\pm$ 2 $^{\circ}$ C for 96 hours, the encoder shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that. 试件在 85 $\pm$ 2 $^{\circ}$ C的温控箱内保持 96 小时,然后在正常温度和湿度下恢复 1 小时,并在此后 1 小时内对试品进行测量,水滴应消失。
7.3	Moisture Resistance 恒定湿热	接触电阻: 5 Ω max. 绝缘电阻: 10M Ω Min. 电气性能应符合第 4.3-4.5 条的要求。	After testing at 40 $\pm$ 2 $^{\circ}$ C, 90~95% RH for 96 hours, the encoder shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 40 $\pm$ 2 $^{\circ}$ C, 90~95%RH 的温控箱内保持 96 小时,然后在正常温度和湿度下恢复 1 小时,并在此后 1 小时内对试品进行测量,水滴应消失。



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7.4	Temperature Cycling 温度转换	After test, Contact resistance: 5 Ω max. Insulation resistance: 10M Ω Min. The electrical performance requirements specified in item 4.3-4.5 shall be satisfied. 实验后: 接触电阻: 5 Ω max. 绝缘电阻: 10M Ω Min. 电气性能应符合第 4.3-4.5 条的要求。	After 5 cycles of following conditions the encoder shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件按下述实验条件试验 5 次, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失 
7.5	Salt Mist 盐雾实验	No remarkable corrosion shall be recognized in metal part 在金属件上没有腐蚀斑点。	The encoder shall be checked after the following test: (1) Temperature: 35 $\pm$ 2 $^{\circ}$ C (2) Salt Solution: 5 $\pm$ 1% (Solids by mass), immersing time: 5 minute. (3) After immersing, salt deposit shall be removed by running water. (4) Duration: 48 hours 试件在下述实验后测量: (1) 温度 35 $\pm$ 2 $^{\circ}$ C (2) 盐溶液浓度: 5 $\pm$ 1% (质量百分比), 浸泡 5 分钟。 (3) 浸泡后的盐沉积物用水冲掉。 (4) 时间: 48 小时

制订:



审核:



核准:

