

规格书

SUBMISSION OF SPECIFICATION

产品名称 (PRODUCT NAME): 步进电机

产品型号 (PRODUCT MODEL): 28BYJ48

客户部品号 (CUSTOMER PART NUMBER): 28BYJ48

编制 DRAWN	校对 CHECKED	审核 APPROVED
产品供货单位 (SUPPLIER):		
产品用户单位 (CUSTMER):		

用户确认 (ACKNOWLEDGEMENT): 于__年__月__日确认此规格书 ACKNOWLEDGEMENT DATE: /MONTH /DAY /YEAR 确认人 (ACKNOWLEDGED): 盖 章 (SEALED):
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确认记载项目:

AFFIRM THE FOLLOWING ITEMS

1、电性能及参数:

1、ELECTRIC PERFORMANCE AND PROPERTIES

2、机械性能:

2、MECHANICAL PERFORMANCE AND PROPERTIES

3、环境性能:

3、ENVIRONMENTAL PERFORMANCE AND PROPERTIES

4、使用寿命试验:

4、ENDURANCE TEST

5、摩擦耐久试验:

5、FRICTION MECHANISM ENDURANCE TEST

			编制日期 (ISSUE DATE) :	2011.03.22									
型号 (MODEL)	28BYJ48	图号 (DWG.No.)	28BYJ48										
(1)	电性能及参数 (ELECTRICAL PERFORMANCE AND PROPERTIES)												
1-1	相数 Number of phase	4 相 4 phase											
1-2	驱动方式 Drive mode	1-2 相励磁单极驱动 1-2 phase excitation unipolar drive											
1-3	步距角 Step angle (output shaft)	5.625°/64 (输出轴), 减速比 1/64 5.625°/64 (output shaft) ,gear reduction ration1/64											
1-4	电压 Voltage	5VDC(电机端子) 5VDC(motor energized voltage)											
1-5	线圈电阻 Resistance per phase	50 Ω ± 7%/相 25°C 50 Ω ± 7%/phase at 25°C											
1-6	最大空载牵出频率 Max response frequency	>900pps >900pps											
1-7	最大空载牵入频率 Max starting frequency	>500pps >500pps											
1-8	牵入转矩 Pull in torque	>300gf.cm / 5VDC 100pps >300gf.cm / 5VDC 100pps											
1-9	绝缘电阻 (Insulation resistance) 在引接线和外壳之间施加 500VDC, 测得绝缘电阻大于 10MΩ。 Insulation resistance between motor leadwire and dead metal parts shall be over 10MΩ measured with 500 VDC megaohmmeter.												
1-10	电气强度 (Dielectric breakdown of insulation) 在引接线和外壳之间施加 50/60Hz 500VAC, 时间 1 分钟, 泄漏电流设置为 1mA, (或 50/60 Hz 600VAC, 时间 1 秒钟, 泄漏电流设置为 1mA), 应无击穿或闪络。 following condition and requirement. Product shall show no abnormality.												
	<table border="1"> <thead> <tr> <th>Applied voltage</th> <th>Time</th> <th>Leak current</th> </tr> </thead> <tbody> <tr> <td>600 VAC 50/60Hz</td> <td>1 second</td> <td>1 mA</td> </tr> <tr> <td>Or 500 VAC 50/60 Hz</td> <td>1 minute</td> <td>1 mA</td> </tr> </tbody> </table>				Applied voltage	Time	Leak current	600 VAC 50/60Hz	1 second	1 mA	Or 500 VAC 50/60 Hz	1 minute	1 mA
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600 VAC 50/60Hz	1 second	1 mA											
Or 500 VAC 50/60 Hz	1 minute	1 mA											
1-11	电机绕阻温升 (Temperature rise of motor bobbin coil) 电机在 5VDC 100HZ, 空载运行条件下, 电机温升达到稳定状态时, 用电阻法测量电机温升应不大于 60K。 Temperature rise of motor bobbin coil shall not exceed 60 deg K when operated in no load condition at 5 VDC and 100pps (pulse per sec)until temperature rise of motor bobbin coil gets constant,measured by resistance method.												
(2)	机械特性 (MECHANICAL PERFORMANCE AND PROPERTIES)												
2-1	外观 (Outside view) 电机在规定使用状态下, 应无影响使用的生锈, 变形等缺陷。 Outside view shall be free from any damage and discoloration which may cause failure at rated operating conditions.												

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2-2	电机结构及尺寸 (Motor structure and size) 电机外形, 结构及尺寸应符合图纸要求 Outside view, structure and size shall match the drawing.						
2-3	重量 (Weight) 电机重约 45 克 Product shall weight about 45 g.						
2-4	输出轴摩擦力矩 (Frictional torque of output shaft) 输出轴摩擦力矩为 1000-2000gf.cm. Frictional torque shall be as follows 1000-2000gf.cm						
2-5	噪音 (Noise level) 电机在 5VDC/100Hz 条件下空载运行, 距电机 10cm 处测得噪音值不大于 40dB (A 计权) Noise level of motor shall be less than 40 dB energized with 5 VDC and 100 pps in no load condition, measured 10 cm from motor.						
2-6	输出轴强度 (Shaft Strength) 径向强度 承载 2kgf 以上历时 10 秒。 Radial strength more than 2 kgf without failure for 10 sec. 抗拉强度 承载 2kgf 以上历时 10 秒。 Pull out strength more than 2 kgf without failure for 10 sec. 抗压强度 承载 2kgf 以上历时 10 秒。 Push out strength more than 2 kgf without failure for 10 sec.						
2-7	引出线抗拉强度 (Leadwire pulling strength) 电机和引出线之间 承载大于 1kgf 历时 10 秒 (初回, 静负荷) Motor and leadwire more than 1kgf/strand. 引出线和端子之间 承载大于 1kgf 历时 10 秒 (初回, 静负荷) Leadwire and connector more than 1kgf/strand.						
2-8	齿轮运行强度 (Gear post strength) 30 个循环耐久试验后, 齿轮应无阻滞, 卡死等现象。1 个循环包括输出轴以 180°/秒的速度正反方向旋转。 Gear post shall withstand without mechanical failure through 30 cycle endurance test. 1 cycle comprised of 180° back and forth rotation of output shaft at speed of 1 second.						
2-9	自定位转矩 (Detent torque) 电机在不通电状态下自定位转矩应大于 450gf.cm Static detent torque shall be more than 450gf.cm measured with pulley weight method.						
(3)	环境性能 (ENVIRONMENTAL PERFORMANCE AND PROPERTIES)						
3-1	使用条件 (Operating conditions) 使用条件如下 (Operating condition shall be as follows):						
	<table border="1"> <tr> <td>温度 (Temperature)</td> <td>-5°C~40°C</td> </tr> <tr> <td>相对湿度 (Relative Humidity)</td> <td>35%~85%</td> </tr> </table>		温度 (Temperature)	-5°C~40°C	相对湿度 (Relative Humidity)	35%~85%	
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	在此条件下, 电机应能满足 1-5, 1-9, 1-10, 1-11, 2-1, 2-3, 2-5, 的要求。 Motor shall satisfy requirements in 1-5, 1-9, 1-10, 1-11, 2-1, 2-2, 2-3, 2-5 in operating conditions.						
3-2	保存条件 (Storage conditions) 保存温度 -20°C~60°C 或 80°C 小于 48 小时 Storage temperature -20°C~60°C. or 80°C, Less than 48H						

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	<p>3-3 标准状态如下 (Test conditions shall be as follows) .</p> <table border="1" data-bbox="483 309 1327 398"> <tr> <td data-bbox="483 309 962 353">温度 (Temperature)</td> <td data-bbox="962 309 1327 353">20±2℃</td> </tr> <tr> <td data-bbox="483 353 962 398">相对湿度 (Relative Humidity)</td> <td data-bbox="962 353 1327 398">65±5%</td> </tr> </table> <p>电机在 5~35℃，相对湿度为 45%~85%RH 的环境中测试应能满足 1-5, 1-9, 1-10, 2-1, 2-2 These condition is applied to requirements in 1-5, 1-9, 1-10, 2-1, 2-2 and 2-3.. 和 2-3 的要求。 Actual test conditions of 5℃~35℃, 45%~85% applicable as far as test results are reliable.</p> <p>3-4 环境试验 (Environmental test) 环境试验后电机应能满足 1-8, 1-10, 2-1, 和 2-5, 2-7 的要求。 Motor shall satisfy requirements in 1-8 ~ 1-10, 2-1 and 2-5 ~ 2-7 after environmental test.</p> <p>3-4-1 耐湿试验 (Humidity test) 电机在温度为 40℃，相对湿度为 90% ~ 95%的环境中置放 48 小时，然后取出在常 Motor stored in ambient condition of 40℃ 90%~95% relative humidity for 温下置放 30 分钟。 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p> <p>3-4-2 耐高温试验 (High temperature storage test) 电机在温度为 80℃，相对湿度为 90%~100%的环境中置放 48 小时，然后取出在常 Motor stored in ambient condition of 80℃, less than 50% relative humidity 温下置放 30 分钟。 for 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p> <p>3-4-3 耐低温试验 (Low temperature storage test) 电机在温度为 -20℃，的环境中置放 48 小时，然后取出在常温下置放 30 分钟。 Motor stored in ambient condition of -20℃ for 48 hours then retrieved and stored in normal ambient condition for 30 minutes.</p> <p>3-4-4 热冲击试验 (Thermal shock test) 5 个循环的热冲击试验. 1 个循环包括: 在 60℃温度下连续置放 2 小时，然后取 5 cycles of thermal shock cycles. 1 cycle consists of successional storage 出在常温下置放 30 分钟; 再在 -10℃的温度下置放 2 小时，然后取出在常温下置 in 60℃ for 2 hours, storage in normal conditions, stored in -10℃ for 2 放 30 分钟 . 电机测试应在电机在常温下置放 30 分钟后进行。 hours and finally in normal condition again. Measurement shall be made after storage in normal ambient condition for 30 minutes.</p> <p>3-4-5 振动试验 (Vibration test) 全振幅 2 mm，振动数 1000 c. p. m 的正弦波，在电机 X, Y, Z 三个方向分别进行振动， 历 Motor shall withstand vibration test when subjected to a vibration of 1000 时 20 分钟 . cpm with 2 mm full wave for 20 minutes in three directions respectively.</p>			温度 (Temperature)	20±2℃	相对湿度 (Relative Humidity)	65±5%
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	<p>3-4-6 冲击或跌落试验 (Shock or Dropping test) 电机在 X, Y, Z 三个方向分别承受 80g 的冲击力各 1 次; 或电机在装箱状态下, 从 75cm 高处, 以 Motor shall withstand without failure when added 80G shock force 1 time, X, Y and Z direction X, Y, Z 三个方向各跌落一次, 电机应正常. respectively, or dropped 1 time in X, Y, and Z direction from height of 75 cm to the concrete floor with motor in packaged condition.</p> <p>(4) 寿命试验 (ENDURANCE TEST) 电机在 5 VDC 50 Hz, 150 gf.cm 的负荷状态下, 经过 10000 小时 90° 正反方向旋转, 电机应能 Motor shall satisfy requirements in 1-8, 1-9, 1-10 and 2-5 after 10,000 hours of 90° 能满足 1-8, 1-9, 1-10 和 2-5 的要求, 牵入转矩应能满足 1-8 的要求. Back and forth continuous rotation in 150 gf.cm load, 5 VDC, 50 pps. Pull in torque shall satisfy 1-8.</p> <p>(5) 摩擦机构耐久试验 (FRICTION MECHANISM ENDURANCE TEST) 电机输出轴在经过 1000 次耐久循环试验后, 摩擦力矩在 800-2500gf.cm, 1 个循环包括 180° 正 Frictional torque of output shaft shall be from 800gf.cm to 2500gf.cm after 1000 cycles 反两个方向旋转 (1 个循环约 1.5 秒) endurance test. 1 cycles consists of 180° back and forth rotation of output shaft and clutch mechanism must be slipped through this test.</p>		