



广东瑞讯电子科技有限公司

Guangdong Ruixun Electronic Technology Co.,Ltd

PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	3/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

1. General Characteristics 一般特性: 1.1 This SPECIFICATION is applicable to optical encoders, which are applied to small current electronic circuit devices 本确认书适用于光学式编码器, 该编码器应用于小电流的电子回路装置上。 1.2 Working principle: By rotating and switching between the reflective area and the light shielding area of the rotating shaft, the photosensitive transistor can be illuminated or shielded to turn on or off, and the current can be turned on or off. 工作原理: 利用转轴反光区与遮光区的旋转切换, 实现对光敏三极管进行光照或遮蔽从而使光敏三极管导通或关闭, 对电流实现通或断。 1.3 Operating Temperature Range: -25°C to +65°C 使用温度范围: -25°C to +65°C 1.4 Operating Relative Humidity: ≤85% RH 相对湿度: ≤85%RH 1.5 Test Conditions: Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows: 实验条件: 若没有特别说明, 则试验大气条件如下: Environment Temperature: 5~35°C 环境温度: 5~35°C Relative Humidity: 45~85% 相对湿度: 45~85% Atmospheric Pressure: 86~106Kpa (860~1060mbar) 大气压力: 86~106Kpa (860~1060mbar)	
2. Appearance, Structure and Dimensions 外观, 结构及尺寸: 2.1 Appearance: The encoder shall be qualified, and no rusts, cracks or plating defects. 外观: 产品外观合格, 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	Rating voltage: IR typical value 1.2V-DC、PT≤10V-DC Rating current: IR≤10mA、PT≤10mA IR recommended current: 5-7mA Note: During circuit design, please adjust the IR current limiting resistor based on the input voltage. It is necessary to ensure that the PT is fully conductive after the encoder is rotated to the conduction grid. 额定电压: IR典型值1.2V-DC、PT≤10V-DC。 额定电流: IR≤10mA、PT≤10mA。 IR建议电流: 5-7mA。 注: 电路设计时请依据输入电压调整IR限流电阻, 必需确保编码器旋转至导通格后PT完全导通。

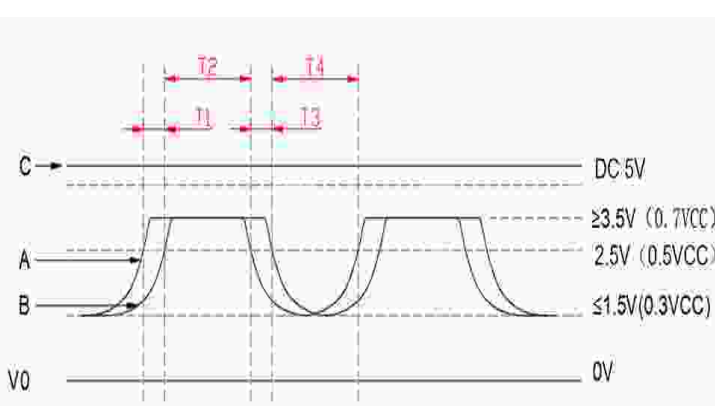


PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	4/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

4. Initial Electrical Characteristics 初始的电气性能

No.	Item 项目	Criteria 标准													
4.1	electric potential conversion characteristics 电气转换特性	Rotate the switch 360 ° at a speed of 1 cycle per second for measurement 将轴旋转360°, 速度每秒1圈进行测量。 Note: ON status - refers to the state where the output voltage is below 2.5V; OFF status - refers to the state where the output voltage is above 2.5V. 注: ON状态-- 指输出电压在2.5V 以下状态 OFF状态 -- 指输出电压在2.5V 以上状态。													
4.2	Output Signal Format 输出信号	Oscillogram and detent points 波形图和卡点位置 2 Phase-different signals (signal A, signal B) Derails shown in (The broken line shows detent position.) A、B 两信号输出 B、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) <table><tr><th>轴旋转方向</th><th>信 号</th><th>输 出 波 形</th></tr><tr><td rowspan="2">顺时针方向</td><td>A (A-C脚)</td><td>ON OFF</td></tr><tr><td>B (B-C脚)</td><td>ON OFF</td></tr><tr><td rowspan="2">逆时针方向</td><td>A (A-C脚)</td><td>ON OFF</td></tr><tr><td>B (B-C脚)</td><td>ON OFF</td></tr></table>	轴旋转方向	信 号	输 出 波 形	顺时针方向	A (A-C脚)	ON OFF	B (B-C脚)	ON OFF	逆时针方向	A (A-C脚)	ON OFF	B (B-C脚)	ON OFF
轴旋转方向	信 号	输 出 波 形													
顺时针方向	A (A-C脚)	ON OFF													
	B (B-C脚)	ON OFF													
逆时针方向	A (A-C脚)	ON OFF													
	B (B-C脚)	ON OFF													

PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	5/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

4.3	phase difference 相位差	The stationary phase differences T1, T2, T3, and T4 are shown in Figure 6: The passage time T1, T2, T3, T4 of the phase difference output of signals A and B $\geq 4\text{ms}$ 止动稳定相位差T1、T2、T3、T4, 如图所示: 信号 A、B 的相位差输出的通过时间 T1、T2、T3、T4$\geq 4\text{ms}$。	
4.4	Electrostatic discharge (HBM) 静电放电 (HBM)	ESD:2000V Max 静电：最大2000V	
4.5	ESD 静电防护	There is static sensitive device inside of the optical encoder, static electricity or overload current can damage the structure of electronic components. Please kindly notice: 1. Anti-static wristbands or gloves should be worn when you contact with the optical encoders 2. All the machines, equipments, working desks, material shelves, etc. should be properly grounded (with a grounding impedance value less than 10 Ω). 3. Storage or shipping the optical encoders should use anti-static bags, anti-static boxes, and anti-static cartons. The use of ordinary plastic products is strictly prohibited. 光学编码器含有静电敏感电子元件，静电或者电流过载会破坏电子元件结构。 请注意以下事项： 1. 接触光学编码器时应佩戴防静电腕带或者防静电手套。 2. 所有的机器设备、工制具、工作桌、料架等，应该做适当的接地保护（接地阻抗值10Ω以内）。 3. 储存或搬运光学编码器应使用防静电料袋、防静电盒以及防静电周转箱，严禁使用普通塑料制品。	

5. Initial Mechanical Characteristics 初始的机械特性

No.	Item 项目	Criteria 标准	Test Method 实验方法
5.1	Number and position of detent 执子点数与位置	24 detent points each detent angle: $15^\circ \pm 3^\circ$ 24 点执子 每点角度: $15^\circ \pm 3^\circ$	Rotation 360° 旋转 360°
5.2	Output Resolution 分解能	12 pulse/360° 各相 12 脉波/360°	Rotation 360° 旋转 360°

PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	6/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

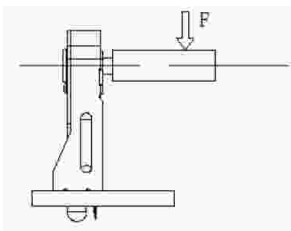
5.3	Rotational Torque 旋转力矩	25±6gf.cm	Apply a tension meter on the midpoint of the actuator (or tip of the shaft) to supply a pressure vertically from its free position to operating position. 在操作元件末端沿操作方向均匀施加静载荷，使操作元件转换到动作位置。
-----	------------------------------	-----------	--

6. Durability Characteristics 机械耐久性能

6.1	Terminal Strength 端子强度	After test, Electrically and mechanically performances shall be satisfied. 试验后： 电气和机械性能无异常。	Applying 3N to the terminal end of the force, for 10±1s in any direction. 向接线端子末端施加 3N 作用力，持续时间 10±1s.
-----	------------------------------	---	---

No.	Item 项目	Criteria 标准	Test Method 实验方法
-----	---------	-------------	------------------

6.2	Vibration Proof 振动	After test, Electrically and mechanically performances shall be satisfied. 试验后： 电气和机械性能无异常。	Install the encoder to the test equipment with conventional installation methods, do test under the following spec. conditions: (1) Vibration frequency range = 10~55 Hz (2) Total amplitude = 1.5mm (3) Sweep ratio: 10~55~10Hz Approx. 1 min (4) Method of changing the sweep vibration frequency: linear (5) Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours (6 hours in total) 编码器采用常规的安装方法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，其中一个方向应是促动元件运动的方向。 (6) 时间：每个方向 2 小时（共 6 小时）。
-----	--------------------------	---	---

6.3	Mechanical Strength 机械强度	After test, Electrically and mechanically performances shall be satisfied. 试验后： 电气和机械性能无异常。	Mount the product to P.C.B. and apply static force of 100gf.cm.Max. Second as shown in the "F". 试件焊接于 P.C.B. 施加静载荷 100gf.cm.Max. "F" 如图所示： 
-----	--------------------------------	---	--



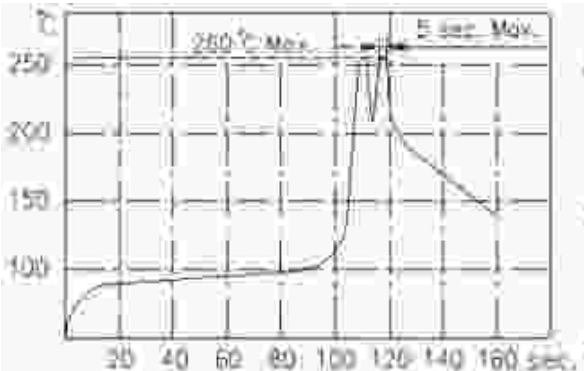
PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	7/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

6.4	Mechanical Life 机械寿命	After test : (1) Comply with electrical characteristics 4.2	1,000,000 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1,000,000 次。
6.5	Electronics Life 电气寿命	(2) Rotational torque: The variation of the detent torque shall be within 40% 试验后: (1) 符合电器性能4.2 (2) 旋转扭力矩：扭力矩衰变在初始值的±40%以内。	1,000,000 cycles of operation shall be performed continuously at a rate of 30 cycles per minute load as follow 5 mA 5VDC. 在带以下负荷的条件下，速度为 30 次/分，在寿命试验设备上连续转换 1,000,000 次，额定负载 5 mA 5VDC。



PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	8/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

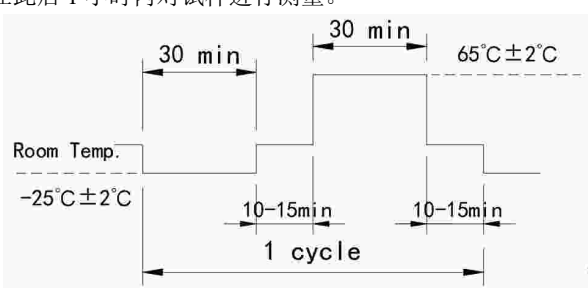
7. Soldering Characteristics 焊接性能:

No.	Item 项目	Criteria 标准	Test Method 实验方法
7.1	Solder Ability 可焊性	Double-sided PCB soldering Pin spot, Morethan 70 of immersedpart shallbecoveredwithsolder. 双面PCB焊锡脚, 超过70%的浸锡面积被焊料所覆盖。	Encoder shall be tested according to the following request: (1)Solder: Sn-3.0 Ag-0.5 Cu tin/lead-free. (2)Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. (3)Solder temperature: 255±5°C. (4)Immersion time: 3±1 seconds. 试件按下述试验条件进行试验: (1) 焊料: Sn-3.0 Ag-0.5 Cu /无铅锡 (2) 焊剂: 焊剂, 质量百分比为 25%松香, 75%甲醇的无色透明溶液。 (3) 焊接温度: 255±5°C (4) 浸渍时间: 3±1s
7.2	Resistance To Soldering Heat 耐焊接热	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	Encoder shall be tested according to the following request: (1) Soldering Temperature & Immersing Time(tin/lead-free): Wave soldering: 260°C Max 5s Max Manual soldering: 350°C Max 2-3s (2) Solder: Sn-3.0 Ag-0.5 Cu tin/lead-free. (3) Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. (4) rate of immersion and emergence: 25(±6)mm(1.00±0.25in.), per second (5) Immersion Depth: The required depth of immersion is to within 1~1.5mm of the device body. (6)Wave soldering times : 1 time . 试件按下述试验条件进行试验: (1)无铅焊接温度及时间: 波峰焊: 260°C Max, 5s Max.; 烙铁焊: 350°C Max 2-3s (2)焊料: Sn-3.0 Ag-0.5 Cu /无铅锡 (3)焊剂: 焊剂, 质量百分比为 25%松香, 75%甲醇的无色透明溶液。 (4)浸渍速度: 25(±6) mm (1.00±0.25in.) 每秒 (5)浸渍深度: 在安装基准面的 1~1.5mm 以内 (6)波峰焊接次数: 1 次 

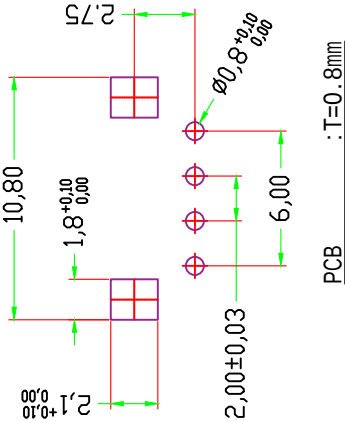
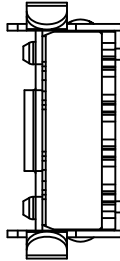
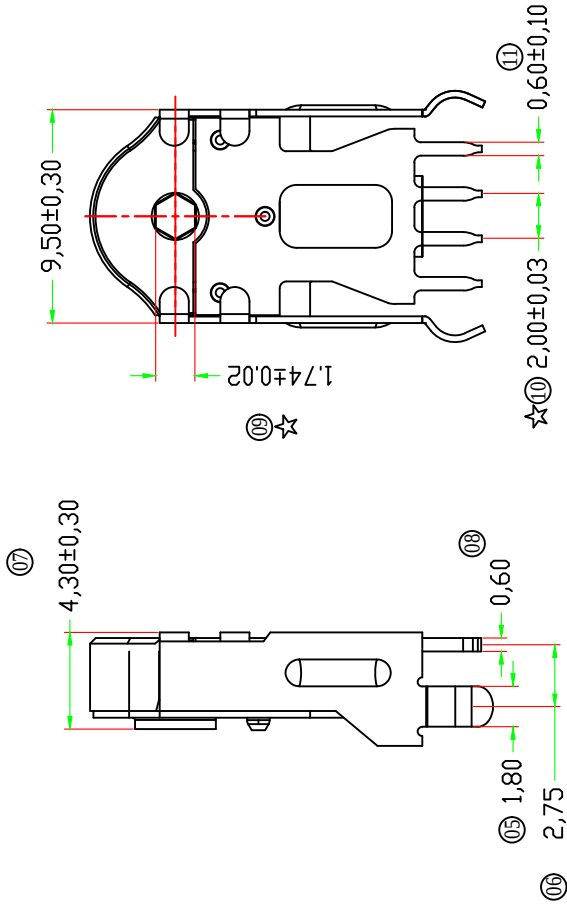
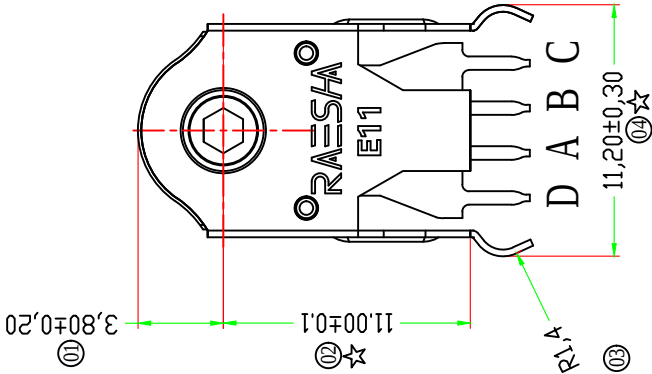


PRODUCT SPECIFICATION 产品规格书		文件版次 EDITION	V0	页码 PAGE	9/10
Model 型号	DIP 光学编码器	料号 PART NO.	C02140039		

8. Weather Proof Characteristics 耐候性能:

No.	Item 项目	Criteria 标准	Test Method 实验方法
8.1	Low Temperature Test 低温	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	The encoder shall be stored at a temperature of $-25 \pm 2^{\circ}\text{C}$ for 96 hours in a thermostatic chamber,. And then the encoder shall be subjected to standard atmospheric condition for 1 hour after which measurements shall be made. 试件在 $-25 \pm 2^{\circ}\text{C}$ 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 小时内对试样进行测量。
8.2	High Temperature Test 高温	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	The encoder shall be stored at a temperature of $65 \pm 2^{\circ}\text{C}$ for 96 hours in a thermostatic chamber,. And then the encoder shall be subjected to standard atmospheric condition for 1 hour after which measurements shall be made. 试件在 $65 \pm 2^{\circ}\text{C}$ 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 小时内对试样进行测量。
8.3	Steady State Damp Heat Test 恒定湿热	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	The encoder shall be stored at a temperature of $60 \pm 2^{\circ}\text{C}$ with relative humidity of 90% to 95% for 96 hours in a thermostatic chamber,. And then the encoder shall be subjected to standard atmospheric condition for 1 hour after which measurements shall be made. 试件在 $60 \pm 2^{\circ}\text{C}$, 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 小时内对试样进行测量。
8.4	Temperature Cycling 温度转换	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	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. 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 小时内对试样进行测量。 
8.5	Salt Mist 盐雾实验	After test, Electrically and mechanically performances shall be satisfied. 试验后: 电气和机械性能无异常。	The encoder spray under the following conditions test (1) Temperature: $35 \pm 2^{\circ}\text{C}$ (2) Salt Solution: $5 \pm 1\%$ (Solids by mass). (3) After test, salt deposit shall be cleaned by water. (4) Duration: 8 hours 试件在下述条件进行喷雾实验 (1) 温度: $35 \pm 2^{\circ}\text{C}$ (2) 盐溶液浓度: $5 \pm 1\%$ (质量百分比)。 (3) 实验后的盐沉积物用水冲掉。 (4) 时间: 8 小时

V0			



PCB : T=0.8mm

1			
2	100	≤ 40%	
3	25 ± 6gf . cm		
4	11.00 ± 0.10mm		
5			
6	1.74 ± 0.02mm		
7	24 12		

ANGULAR TOLERANCE: ±1.0°		TOLERANCE (±)	
DIMENSIONS			
0<L≤6	0.05	0.10	0.20
6<L≤30	0.10	0.20	0.30
30<L≤80	0.15	0.30	0.40
80<L≤180	0.20	0.40	0.50
180<L≤315	0.30	0.50	0.70

RAESHA		RAESHA-DIP	
Guangdong Ruixun Electronic Technology Co. LTD		E11/ / 1.74/ 25	
1:1		C02140039	

Guangdong Ruixun Electronic Technology Co. LTD		RAESHA-DIP	
E11/ / 1.74/ 25		C02140039	

Guangdong Ruixun Electronic Technology Co. LTD		RAESHA-DIP	
E11/ / 1.74/ 25		C02140039	

Guangdong Ruixun Electronic Technology Co. LTD		RAESHA-DIP	
E11/ / 1.74/ 25		C02140039	