

CUSTOMER'S NAME

ALPHA REFERENCE NO.

TAYDA (THAILAND) COMPANY LIMITED

SP22100008

SPECIFICATION

PART NO.	ALPHA MODEL NAME
	RE111F-21B3-15F-20P
	A-6329

MODEL NAME

APPROVAL

MODEL NO.

PREPARED BY

REVIEWED BY

APPROVED BY



ALPHA

台灣艾華電子工業股份有限公司

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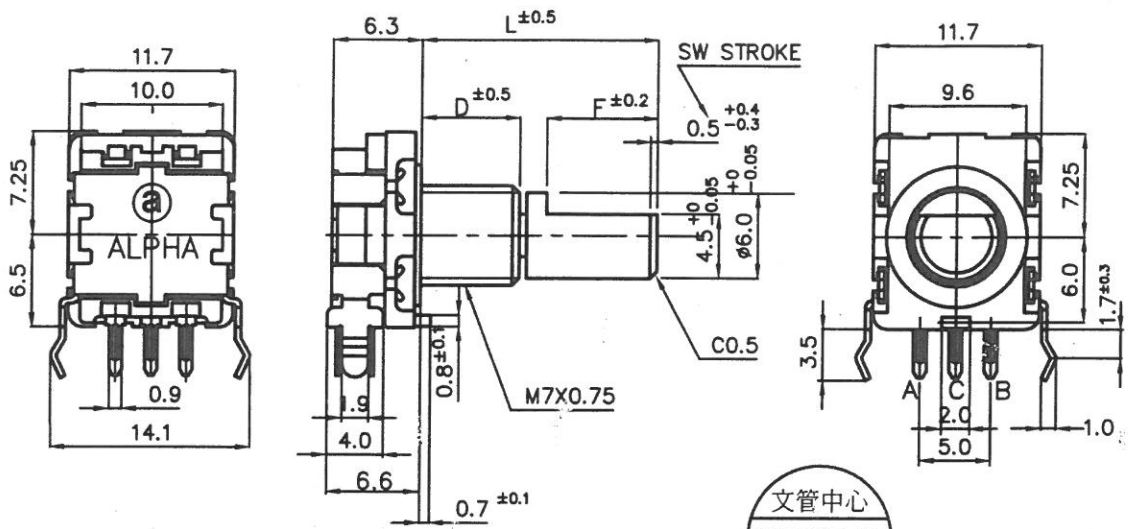
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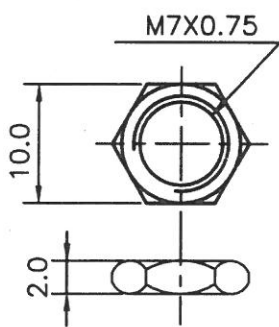
EMAIL: sales@taiwanalpha.com.tw

URL: <http://www.taiwanalpha.com>

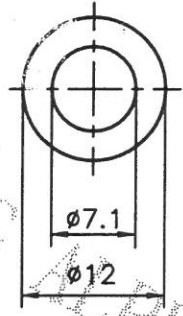
THIRD ANGLE PROJECTION



文管中心
2015.04.01
發行章



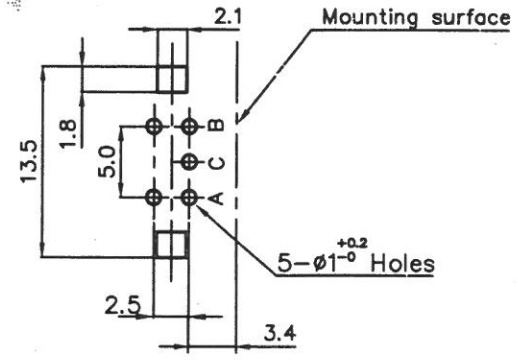
NUT 1PC



WASHER 1PC

	D	L	F
	5(B1)	10	3.5
	5(B1)	11.8	4.5
	5(B1)	13	6
	5(B1)	15	7
	5(B1)	20	10

	D	L	F
✓	7(B3)	15	6
	7(B3)	17	7
	7(B3)	20	10
	7(B3)	21.5	10
	7(B3)	23.5	12
	7(B3)	23.8	12
	7(B3)	25	12
	7(B3)	30	12



P.C.B. MOUNTING DETAIL

				11ø ENCODER WITH PUSH ON SWITCH		
				RE111F-21(D)-(L)F-15P		
				RE111F-21(D)-(L)F-20P		
No.	DATE	DESCRIPTION	PART No.	NAME		
TOL.UNLESS OTHERWISE STATED		DIMENSION	SCALE	DRAWN BY	CHECKED BY	APPROVED BY
less than	10	±0.3		李 2015.3.31 華		潘 2015.3.31 坤
above	10~30	±0.5	mm			
above	30~100	±1.0				
above		±5'				

ROTARY ENCODER SPECIFICATION

1. 一般事項 General :

1.1 適用範圍 Scope :

此規格為 11mm 小型迴轉式編碼器，適用於電子設備內之微小電子電路。

This specification applies to 11mm size low-profile rotary encoder (incremental type) for microscopic current circuits, used in electronic equipment.

1.2 標準溫濕度條件 Standard atmospheric conditions

除非有特殊規定，否則測試條件如下所述：

Unless otherwise specified. The standard range of atmospheric conditions for making measurements and tests is as follows :

環境溫度 Ambient temperature 15~ 35°C

相對溼度 Relative humidity 25~ 85%

氣 壓 Air pressure 86~106kpa

若是因周圍環境影響而有不確定的測試值，則其測試條件變更如下列所述：

If there is any doubt about the results, measurements shall be made within the following limits :

環境溫度 Ambient temperature 20±1°C

相對溼度 Relative humidity 63~ 67%

氣 壓 Air pressure 86~106kpa

1.3 使用溫度範圍：

Operating temperature range : -10°C to +70°C

1.4 保存溫度範圍：

Storage temperature range : -40°C to +85°C

2. 構造 Construction :

2.1 尺寸：外型尺寸，請參考所附成品圖。

Dimensions : Dimensions refer to attached drawing.

3. 額定 Rating :

3.1 額定電壓： D.C.5V 10mA (1mA min)

Rated voltage : D.C.5V 10mA (1mA min)

4. 電氣規格 Electrical characteristics :

4.1 出力信號 Output signal :

軸回轉方向 Shaft rotational direction	信號 Signal	出力波形 Output
順時針方向 C.W.	A (A -C 端子間) A (Terminal A -C)	OFF ON
	B (B -C 端子間) B (Terminal B -C)	OFF ON
逆時針方向 C.C.W.	A (A -C 端子間) A (Terminal A -C)	OFF ON
	B (B -C 端子間) B (Terminal B -C)	OFF ON

The broken line shows detent stability point

ROTARY ENCODER SPECIFICATION

4.2 分解能力 Resolution :

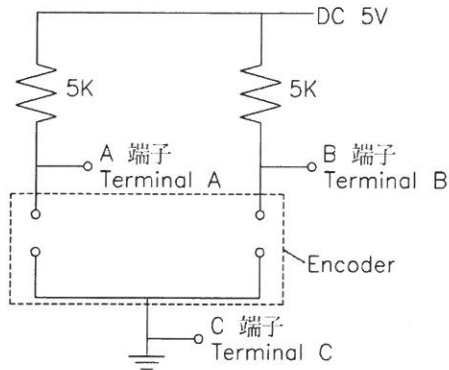
1 回轉出力脈波數 : 20 脈波 /360°

Number of pulses in 360° rotation : 20 pulses/360° for each phase.

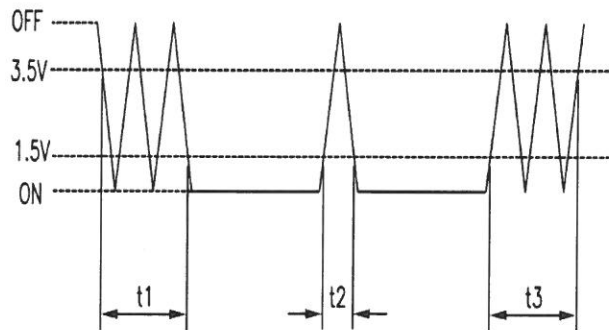
4.3 開關動作特性 Switching characteristics :

依下圖(1)測試迴路使用，軸回轉速度 360°/S 測試。

Measurement shall be made under the condition follows, shaft rotational speed 360°/S.



Fig(1)



Fig(2)

※ 碼在 ON 狀態 : 出力電壓在 1.5V 以下之狀態。

Code - ON area : The area which the voltage is 1.5 or less.

※ 碼在 OFF 狀態 : 出力電壓在 3.5V 以上之狀態。

Code - OFF area : The area which the voltage is 3.5 or more.

4.3.1 振動 Chattering :

碼從 OFF-ON 及 ON-OFF 之間 ; 出力 1.5V~3.5V 接觸時間的規定 : $t1, t3 \leq 2ms$

Specified by the signal's passage time from 3.5V to 1.5V or from 1.5V to 3.5V of each switching position. (code OFF-ON or ON-OFF) : $t1, t3 \leq 2ms$

4.3.2 折動雜音 (急跳) Sliding noise (bounce) :

在 ON 部份指定 1.5V 以上的電壓變動時間 : $t2 \leq 2ms$

Specified by the time of voltage change exceed 1.5V in code-ON area : $t2 \leq 2ms$

4.3.3 折動雜音 Sliding noise :

在 OFF 時的電壓變動 : 3.5V 以上。

The voltage change in code-OFF area : 3.5V min.

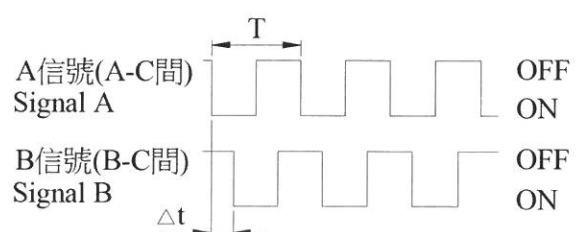
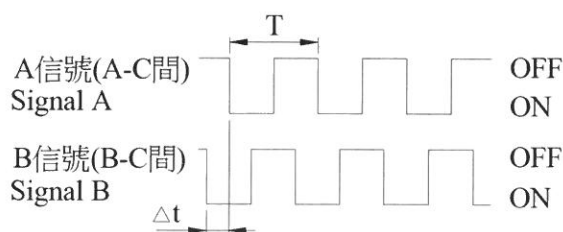
4.4 相位差 Phase-difference :

軸在每秒 360 度的恆速回轉環境下操作 : $\Delta t = T/4 \pm T/6$.

Measurement shall be made under the condition which the shaft is rotated in 360° / S constant speed : $\Delta t = T/4 \pm T/6$.

順時針方向(C.W)

反時針方向(C.C.W)



ROTARY ENCODER SPECIFICATION

4.5 耐電壓 Dielectric strength :

端子與軸套間加 A.C 300V 1 分鐘。(漏電電流 1mA)

A voltage of 300V A.C. shall be applied for 1 min between individual terminals and bushing.
(Leak current 1mA)

4.6 絕緣阻抗 Insulation resistance :

端子與軸套間加 D.C 250V, 100MΩ以上。

Measurement shall be made under the condition which a voltage of 250V D.C is applied between individual terminals and bushing : 100 MΩ min.

5. 機械特性 Mechanical characteristics :

5.1 全迴轉角度 : 360°

Total rotational angle : 360° (Endless)

5.2 迴轉轉矩 : 200gf.cm Max (19.6mN.m Max)

Rotational torque : 200gf.cm Max (19.6mN.m Max)

5.3 段點數及位置 : 20 段點 (每一段點角度 18°±3°)

Number and position of detents : 20 detents (Step angle 18°±3°) rotational play with parts in detent position ±3°.

5.4 端子強度 : 端子前端任意方向加 300gf.cm (29.4mN.m) 靜負荷 1 分鐘。

Terminal strength : A static load of 300gf.cm (29.4mN.m) shall be applied to the tip of terminals for 1 minute in any direction.

5.5 軸拉壓強度 : 在軸壓及拉的方向加 10kgf (98.1N) 的淨負荷 10 秒鐘。

Push-pull strength of shaft : Push and pull static load of 10kgf (98.1N) shall be applied to the shaft in the axial direction for 10sec. (After installing)

5.6 軸晃動 : 軸前端 5mm 的位置加 500gf (49mN) 力量 : 0.8xL/30mm 以下

Shaft wobble : A momentary load of 500gf to be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft : 0.8xL/30mm Max.

L : Measurement point from mounting surface.

5.7 軸套螺絲固定強度 : 9kgf.cm 以上 (0.88N.m 以上)

Bushing nut tightening strength : 9kgf.cm min. (0.88N.m min.) (die-casting material)

6. 耐久性能 Endurance characteristics :

6.1 迴轉壽命 (無負載) : 15,000 次 (連動速度 500 回/小時, 每回為順反轉各 1 圈),

迴轉力須符合初期規格值 : + 10 % / - 30 % ,

振動值需符合 : $t1.t3 \leq 5ms$ 。

Rotational life (No load) : 15,000 cycles (500 continuous cycles per 1 hour,

1 cycle : rotate 360°ccw rotate 360°cw) .

Rotational torque : Relative to the previously specified value + 10 % / - 30 %.

Chattering : $t1.t3 \leq 5ms$.

PUSH SWITCH SPECIFICATION

1. 額定容量：D.C 16V 3A (10mA min.)

Switch rating (resistor load) : D.C 16V 3A (10mA min.)

2. 電氣規格 Electrical characteristics :

2.1 接觸阻抗：100mΩ以下 (D.C 5V 1mA 電壓下降法測定)

Contact resistance : 100mΩ Max.

(Measure by the D.C 5V 1mA voltage drop method.)

2.2 絕緣阻抗：D.C 250V 測量端子與軸套間 100MΩ以上。

Insulation resistance : D.C 250V 100MΩ min.

Measure shall be made under the condition which a voltage of D.C 250V is applied between individual terminals and bushing.

2.3 電壓：A.C 300V 1分鐘 (漏電電流 1mA)

Dielectric strength : A.C 300V 1min. (leak current 1mA)

A voltage of A.C 300V shall be applied for 1 min.

Between individual terminals and bushing. (leak current 1mA)

3. 機械規格 Mechanical characteristics :

3.1 接點回路：單極單投 (Push ON)

Contact arrangement : S.P.S.T. (Push ON)

3.2 開關移動量：0.5 (+0.4/-0.3) mm

Switching stroke : 0.5 (+0.4/-0.3) mm

3.3 開關動作力：600±300gf (59±29.4mN.m)

Switch operation force : 600±300gf (59±29.4mN.m)

4. 耐久性能 Endurance characteristics :

4.1 動作壽命 (無負載)：25,000 次 (連動速度 500 次/小時)，接觸阻抗：200mΩ以下。

Operating life : 25,000 cycles, (500 continuous cycles per 1 hour)

Switch contact resistance : 200mΩ Max.

APPLICATION NOTES SPECIFICATION

1. 避免儲藏於高溫、潮濕及腐蝕的場所。
Avoid storing the products in a place at high temperature、high humidity and in corrosive gases.
2. 編碼器信號的計算方式應根據操作回轉的速度、信號取樣時間以及電子回路內微電腦軟體而設計。
The encoders pulse count method should be designed with taking operating speed、sampling Time and the design of the micro computer software, ect.
3. 使用溫度範圍：-10°C ~ +70°C
Operating temperature range：-10°C ~ +70°C.
4. 保存溫度範圍：-40°C ~ +85°C
Storage temperature range：-40°C ~ +85°C.
5. 自動錫爐溫度：260±5°C，4 秒
Dip soldering：To be performed in 4 seconds within 260±5°C.
6. 手鐸溫度：350±5°C，3 秒
Manual soldering：To be performed in 3 seconds within 350±5°C.
7. 預熱時間不超過兩分鐘，焊錫界面 (即印刷電路板底) 最高預熱溫度不超過 100°C。
Regarding preheating, the entire flow duration should not exceed 2 minutes, and soldering surface temperature (undersurface of PCB) shall be settled within 100°C.

無鉛焊錫與保管條件共通規格書

Common Specification of Lead-Free Soldering and Storage conditions

以下焊錫條件以可變電阻置於單層 1.6mm 厚度之印刷電路板上測試為基準。

The specification below is based on testing results of 1.6mm thickness single layer printed circuit board.

1. 自動或半自動機台焊錫條件：

For Automated or Semi-Automated Soldering Equipments:

1.1 使用發泡式且比重 0.82 以上的助焊劑，發泡高度以印刷電路板厚度一半為標準，且助劑不能流入可變電阻基板表面及印刷電路板表面。

Flux of 0.82 specific gravity, applied by foam fluxer, shall be used. Foam head shall be limited to the height which is half thickness of printed circuit board to be soldered. No flux should be allowed to run up onto resistive element board of potentiometer and the surface of printed circuit board.

1.2 預熱時間不超過兩分鐘，焊錫接面 (即印刷電路板底) 最高預熱溫度不超過 100°C。

Regarding preheating, the entire flow duration should not exceed 2 minutes, and soldering surface temperature (undersurface of PCB) shall be settled within 100°C.

2. 手工焊錫、自動或半自動機台焊錫不得超過一回。

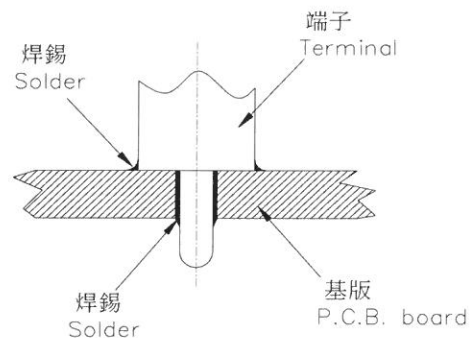
Regardless of soldering facility and method, solder dipping or solder smearing must not be carried out more than 1 time.

2.1 焊錫注意事項:

Caution for soldering:

如圖所示，請避免 PCB 上層表面有焊錫

Please avoid soldering on upper surface of P.C.B. as shown.



3. 保管條件(Storage conditions):

產品需儲存在原始的包裝,以及保持常溫常濕、避免陽光直射、遠離任何腐蝕性氣體.產品需盡快完全地使用完,建議最慢不要超過交貨後 6 個月. 產品經拆封後,全部的數量都需迅速地使用完.

The products shall be stored in the original packaging and kept at room temperature and humidity, out of direct sunlight, and away from any and all corrosive gas. The products shall be completely used as soon as possible, but no longer than 6 months from the date of delivery. Once product packaging is opened, the complete quantity of such products shall be promptly used.