

CUSTOMER'S NAME

HY-1607021

2016.7.15

SPECIFICATION

PART NO.	HONG YU MODEL NAME
	HES190-40D9-19F65-14P

CUSTOMER'S MODEL NAME
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APPROVAL



PREPARED BY	REVIEWED BY	APPROVED BY	MARKET BY
			



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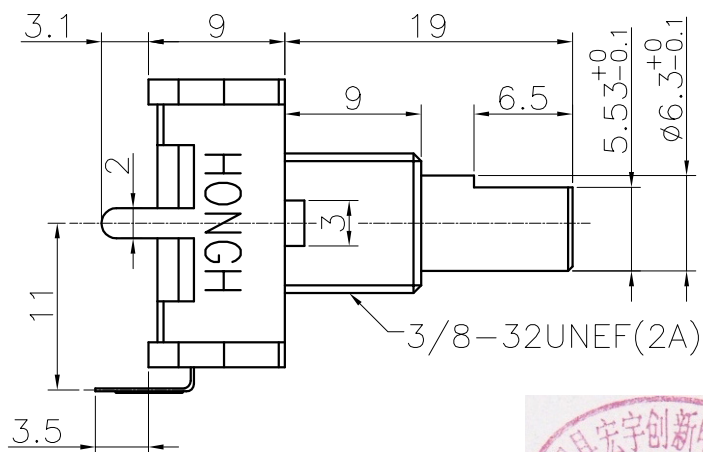
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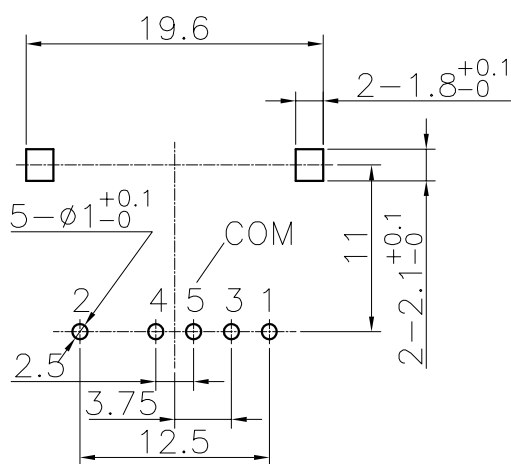
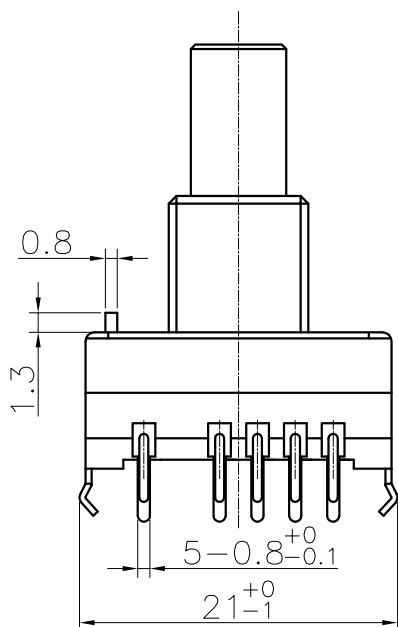
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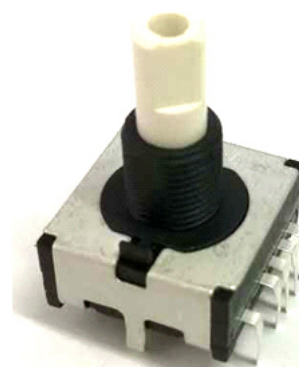
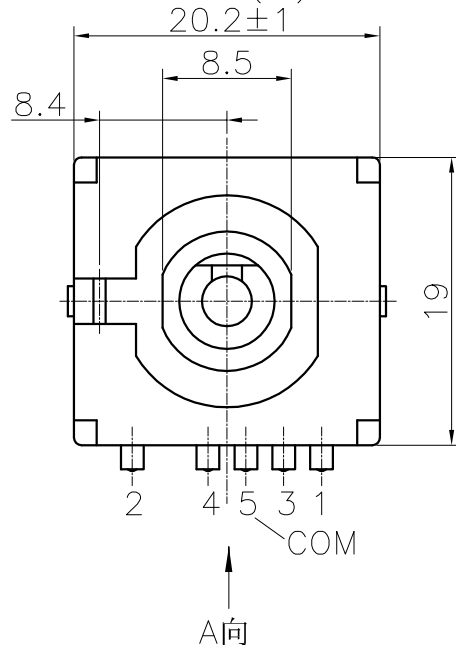


A向



P.C.B MOUNTING HOLES

Position NO.1(0°) show below



C.W → ● : ON

一般公差	
10以下	±0.3
10~100	±0.5
100以上	±0.8
角度	±5°

Position NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Rotation angle(°)	0	25.7	51.4	77.1	102.8	128.5	154.2	179.9	205.6	231.3	257	282.7	308.4	334.1
Terminal NO.	1	●	●		●	●			●	●			●	●
	2		●	●	●					●	●	●	●	
	3				●	●	●	●	●	●	●			
	4							●	●	●	●	●	●	●
	5(com.)	●	●	●	●	●	●	●	●	●	●	●	●	●

單位		比例	版次	宏宇創新電子有限公司										
mm		/	A0	HONG YU INNOVATION ELECTRONICS CO., LTD.										
5	4	3	2	1	日期	變更說明	製圖	審核	核准	類型	H-ES19 Series			
丘	志敏	黃	力文	卓	紅雨					品名	HES190-40D9-19F65-14P			
										圖號	TZ-ES-A-001			



宏宇創新電子有限公司

HONG YU INNOVATION ELECTRONICS CO., LTD.

HES19 ENCODER SPECIFICATION

HES19 系列編碼器規格書



一、一般事項 General:

1.1 適用規格 Scope

本規格書適用於微小電流回路的電子設備，屬 19 型回轉型格雷碼編碼器。

This specification applies to 19mm size low-profile rotary Gray code encoder (incremental type) for microscopic current circuits, used in electronic equipment.

1.2 標準狀態 Standard atmospheric conditions:

除另有規定外，測量應在以下狀態下進行：

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and test is as following limits:

溫度 Ambient temperature : 5°C to 35°C

相對濕度 Relative humidity : 45% to 85%

氣壓 Air pressure : 86kpa to 106kpa

如果對上述所提到的條件中所做的實測值有疑問的話，應使用以下條件進行測量：

If doubt arises on the decision based on the measured values under the above-mentioned conditions, the following conditions shall be employed :

溫度 Ambient temperature : 20 ± 2°C

相對濕度 Relative humidity : 60% to 70%

氣壓 Air pressure : 86kpa to 106kpa

1.3 使用溫度範圍

Operating temperature range : - 20°C to + 60°C

1.4 保存溫度範圍

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

二、構造 Construction

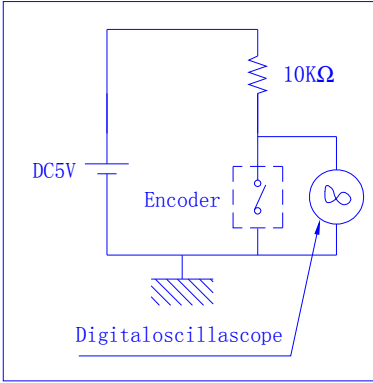
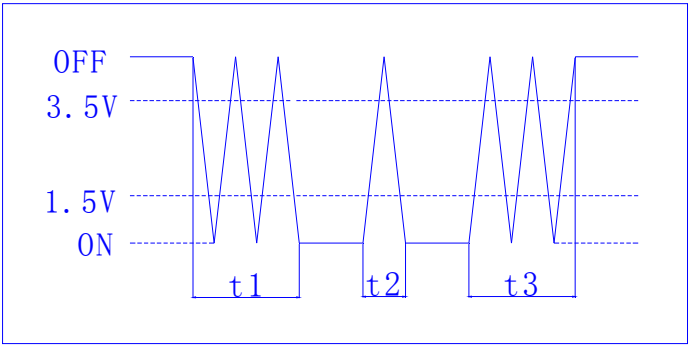
2.1 尺寸 Dimensions

見所附成品圖 Refer to attached drawing

2.2 機能 function: Rotary encoder

三、額定值 Rating

3.1 額定容量 Rated (resistive load): DC 10V、1mA

四、電氣性能 Electrical Characteristics		
項目 ITEM	條件 CONDITIONS	規格 SPECIFICATIONS
4-1. 開關特性 Switching characteristics	下(圖 1)所示回路, 軸以 $360^{\circ} / S$ 的速度轉動測定。 Measurement shall be made under the condition as follows. Shaft rotational speed : $360^{\circ} / S$ Test circuit : (fig.1)	
	圖 1(fig. 1) 	圖 2(fig. 2) 
4-2. 振蕩 Chattering	編碼從 OFF→ON 或 ON→OFF 時, 輸出 3.5V~2.5V 的通過時間應符合規定。 Specified by the signal's passage time from 3.5V~2.5V of each switching position (code OFF~ON OR ON~OFF)	$t1, t3 \leq 5ms$
4-3. 滑動 雜訊 Bounce	在 ON 部分指定 1.5V 以上的電壓變動時間 Specified by the time of voltage change exceed 1.5V in code-ON area	$t2 \leq 5ms$
4-4. 折動雜音 Sliding noise	在 OFF 時的電壓變動 The voltage change in code-OFF area	3.5V MIN
4-5. Output code	Refer to output code table	Gray code 見所附成品圖 Refer to attached drawing
4-6. 絕緣阻抗 Insulation resistance	在端子和支架間施加電壓 250V DC。 Measurement shall be made under the condition which a voltage of 250V DC is applied between individual terminals and frame.	50 MΩ 以上 50 MΩ min
4-7. 耐電壓 Dielectric strength	在端子和支架間施加 AC50V 電壓 1 分鐘。 a voltage of 50V AC shall be applied for 1 minute between individual terminals and frame.	不得有絕緣破壞 Without arcing or breakdown.

4-8. 接觸阻抗 Contact resistance	Measure voltage drop, when apply 1mA between Terminal C and each terminals .Then calculate contact resistance. The measurement is done at the click position.	10 Ω 以下 10 Ω Max
五、機械性能 Mechanical Characteristics		
5-1. 全回轉角度 Total rotational angle		360° (無止檔點) 360° (Endless)
5-2. 定位點力矩 Deent torque	標準狀態下測試 Measured at standard atmospheric conditions	600±200 gf.cm
5-3. 定位點數及位置 Number and position of detent		■ 14 點定位間隔角度 25.7° ±3° 14 detents step angle : 25.7 ° ± 3 ° □ 16 點定位間隔角度 22.5° ±3° 16 detents step angle : 22.5° ±3°
5-4. 軸的推拉強度 Push-pull strength of shaft	在軸端，沿軸向施加 100N 的靜負荷力推和 50N 的靜負荷力拉各 15 秒鍾(產品焊錫固定在 PCB 上)。 Static load of 100N (push) or 50N (pull) shall be applied to the shaft in the axial direction for 15s. (After installing)	Without damage or excessive play in shaft No excessive abnormality in rotational feeling。 And electrical characteristics shaft be satisfied。 轴无破损，旋转、电气性能无异常
5-5. 端子強度 Terminal strength	在端子的先端施加 5N(500g) 的力 60 秒。 A static load of 5N(500g) be applied to the tip of terminals for 60 seconds in any direction.	端子無損壞，無過度的鬆動，允許變形。 Without damage or excessive looseness of terminals. Terminal bend is permitted.
5-6. 軸的回轉方向擺動 Shaft play in rotational wobble	用角度板測定。 Testing by angle board.	4° 以下 4° Max 
5-7. 軸向間隙 Shaft play in axial direction		0.2mm 以下 0.2mm Max
5-8. 軸擺動 Shaft wobble	The main body is fixed, bending moment of 5mN · m to be applied to the shaft at 20mm from the mounting surface. If the shaft length is less than 20mm the value shall be calculated as right formula. L: Measurement point from mounting surface.	0.5*L/30mm p-p L: 指安裝平面到軸的柄端的距離。 0.6*L/30mm p-p Max L :Distance between mounting surface and measuring point on the shaft

5-9. 轴套螺丝固定强度 Bushing nut tightening strength	1N.m 以上 1N.m MIN	
六、耐久性能 Endurance Characteristics		
項目 ITEM	條件 CONDITIONS	規格 SPECIFCAIONS
6-1. 回轉壽命 Rotational life	在無負荷條件下軸以 800 周/小時速度(720 度/次) The shaft shall be turned at a speed of 800cycles/hour (72° /cycles) .	8,000 周 8,000 cycles
6-2. 耐濕性 Damp hert	溫度 $60 \pm 2^{\circ}\text{C}$ ，濕度 90-95% 的恒溫恒濕槽中放置 96 ± 4 小時后，在常溫、常濕中放置 1.5 小時后測試。 The encoder shall be stored at temperature of $60 \pm 2^{\circ}\text{C}$ with relative humidity of 90% to 95% for $96 \pm 4\text{H}$ in a thermostatic chamber. And the enconder shall be subjected to standard atmospheric conditions for 1.5H, After which measurements shall be made.	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality. 
6-3. 耐熱性 Dry heat	溫度 $85 \pm 3^{\circ}\text{C}$ 的恒溫箱中放置 96 ± 4 小時，常溫，常濕放置 1.5 小時后測試。 The encoder shall be stored at a temperature of $85 \pm 3^{\circ}\text{C}$ for $96 \pm 4\text{h}$ in a thermostatic chamber. And then the encoder. Shall be subjected to standard atmospheric conditions for 1.5h, After which measurements shall be made.	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality.
6-4. 低溫特性 Cold	溫度 $-40 \pm 3^{\circ}\text{C}$ 的恒溫箱中放置 96 ± 4 小時，常溫，常濕放置 1.5 小時后測試。 The The encoder shall be stored at a temperature of $-40 \pm 3^{\circ}\text{C}$ for $96 \pm 4\text{h}$ in a thermostatic chamber. And then the encoder. Shall be subjected to standard Atmospheric conditions for 1.5h, After which Measurements shall be made.	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality

6-5. 耐落下性 Free falling	產品以任意姿態從 60cm 高自由落下到混凝土地板上。 The encoder shall be fallen freely at any posture from 60cm height to the concrete floor covered with vinyl-tile. After which measurement shall be made.	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality
6-6. 耐振性 Vibration	The following vibration shall be applied to the encoder, after which measurement shall be made: The entire frequency range, from 10 Hz to 55Hz and return to 10Hz ,shall be transversed in 1 min. Amplitude(total excursion):1.5mm This motion shall be applied for a period of 2h in each of 3 mutually perpendicular axes(A total of 6h).	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality 
6-7. 防水性 Waterproof property	产品置于水深 5cm 水中 24 小时后, 测试时水滴必须抹干 Under 5cm depth of water for 24 hours, Water drops shall be removed	无电气及机械上性能的异常现象 There are no mechanical abnormality and no electrical abnormality

七、Condition of soldering

焊錫條件

Soldering shall be certified with following condition.

作焊錫處理時，請確保在下列工作條件。

7-1.Substrate to be soldered: Copper clad laminated phenol board in two surface of 1.6mm thickness.

使用基板：t1.6 厚兩面銅箔積層板

7-2.Solder Flux: Flux of 0.82 specific weight in bubbling type solder flux coating apparatus shall be used and bubbling surface height shall be defined substantially as half thickness of substrate. Flux shall not flow up on the substrate surface.

助焊劑：使用發泡式比重 0.82 以上的焊劑，發泡面高大致在基板厚度一半的位置，而助焊劑不可流入基板表面上。

7-3.Preheating: Surface temperature of the substrate shall be settled within 100℃ in two minutes.

預熱：基板表面溫度 100℃ 以下，2 分鐘內。

7-4.Soldering: To be performed in 4 seconds within 260℃±5℃.

焊錫：260℃±5℃, 4 秒以內。

7-5. Manual soldering condition: To be performed in 3 seconds within 350±5℃.

手焊：350℃±5℃, 3 秒以內。

Please use the above process only one or two times.

以上工程通過 1 次或 2 次即可。