



APPROVAL SHEET

NO : M20210615084

CUSTOMER : 香港刚达制品有限公司

PRODUCT NAME : Rotary Potentiometer

CUSTOMER'S MODEL NO: _____

CUSTOMER'S REF NO : _____

ECC MODEL NO : R1620S-7A1-B220K-GP

DATE : 2021.06.15

APPROVED

订单联系人: 陈伟欣
2021/6/16

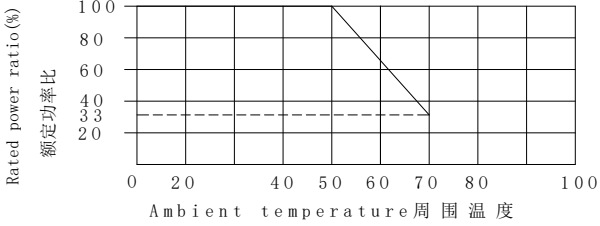
Thank you very much for the interest in our products. with the samples
Please find two copies of approval sheet. Please send back one signed
Copy to us by express to the following address after having approved.



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1 ELECTRICAL CHARACTERISTICS 電氣特性

Item	Content 項目	Test Condition 測試條件	Specification 規格	
1.1	Total resistance and tolerance 總阻值和誤差	The resistance between terminals 1 and 3 shall be measured. 端子 1-3 間阻值測定。	220KΩ ±20%	
1.2	Resistance law 阻抗變化特性	Measurement shall be made by the resistance law method for other procedures(refer JISC5261 standard). 用電壓法測試，參照 JISC5261 標準。	B Taper	
1.3	Power rating 額定功率	Power rating is based on continuums full load operation at the maximum voltage between terminals 1 and 3 . Power rating vs. ambient temperature shall be denoted on the following graph. 端子 1-3 間連續負載後的最大功率。環境溫度對功率影響的曲線如下圖表示： 	B taper : 0.1W B 曲線 Other taper : 0.05W 其他曲線	
1.4	Rated voltage 額定電壓	Rated voltage 額定電壓: $E = \sqrt{PR}$ P: 額定功率(W) Nominal total resistance R: 公稱全阻抗值(Ω) When the rated voltage exceeds the maximum operating voltage,the maximum operating voltage shall be the rated voltage 額定電壓大於最高使用電壓時,最高使用電壓作為額定電壓.		
1.5	Max. operating voltage 最高使用電壓		B taper: 200V AC Other taper: 150V AC	
1.6	End resistance 殘留電阻	The resistance at each end of the (A).Between terminals 1 and 2, and 2 and 3 shall be measured. A: Angle of effective rotation 接觸刷停留在(A)終端位置,在端子 1-2 間,端子 2-3 間測定之電阻值. A:有效回轉角度	≤20Ω	
1.7	Rotational noise 轉動噪音	DC 20V, when the rated voltage is 20V or less, its rated voltage shall be applied to the terminals between 1 and 3,And then the noise shall be measured by the specified speed. 在端子 1-3 間加直流電壓 20V(額定電壓≤20V,則以額定電壓值測試)後,測定的雜音電壓. Shaft rotation : 30 rotation / min 軸轉速:30 轉/分	≤100mV	
1.8	Insulation resistance 絕緣阻抗	A voltage of 500V DC shall be applied 1 min, after which measurement shall be made DC 500V 1 分鐘	Between individual terminals and frame 端子-固定板	100MΩ
1.9	Dielectric strength 耐電壓	Trip current 感應電流: 2mA Measuring frequency: 50~60Hz 周波數 500V AC for 1 min	Between individual terminals and frame 端子-固定板	Without damage to parts arcing or breakdown etc. 無損傷，變形，絕緣破壞等情形

Item	Content 項目	Test Condition 測試條件	Specification 規格
1.10	Switch contact Resistance 开关接觸電阻		$\leq 100m\Omega$
1.11	Switch Rated Power 開關額定功率		1.0A at DC 12V

2 MECHANICAL CHARACTERISTICS 機械特性

Item	Content 項目	Test Condition 測試條件	Specification 規格
2.1	Total mechanical Rotation 全回轉角度	Angle of effective rotation 有效旋轉角度	$300\pm 5^\circ$
2.2	Rotational torque 旋轉力矩	Rotational speed 旋轉速度 60/ Sec. Standard atmospheric conditions 常溫 5°C 至 35°C	20~200gf.cm
2.3	Terminal strength 端子強度	A static load of 1.8kgf shall be applied to the terminals for 10 S in any direction(After soldering). 在端子任意方向施加 1.8kgf 的靜載荷並保持 10 秒(焊錫後)	Without excessive play in terminals or poor contact. 無顯著鬆動或接觸不良
2.4	End stop strength 止檔強度	The following torsion moment load of 4.0kgf.cm shall be applied to the shaft for 5sec at both ends (after soldering) 焊錫後於旋轉前後兩端末加 4.0Kgf.cm 力矩並持續 5 秒.	Without functional problem cause of pockety . terminals or poor contact. 無顯著鬆動或接觸不良
2.5	Thrust and Tensile shaft 軸向推拉強度	Thrust and tensile static load of 5Kgf shall be applied to the shaft in the axial directions for 10 s (After soldering). 在與軸垂直的端面方向加 5Kgf 靜載荷並保持 10 秒(焊錫後)。	Without damage to, or play in shaft. No abnormality in rotational torque . Electrical characteristics shall be satisfied. 軸無破損，旋轉無異常。電氣性能符合規定要求。
2.6	Shaft wobble 軸擺動	A momentary load of 1Kgf shall be applied at the point 5 mm from the tip of the shaft in a direction perpendicular to the axis (after solding) 焊錫後在與軸垂直的端面 5mm 處施加 1Kgf 靜載荷	$0.7 \times L / 30 \text{ mm}$ L: 固定面到測試點的距離
2.7	Switch Rotation Angle 開關旋轉角度		$35^\circ \pm 10^\circ$
2.8	Switch Action 開關作動力		50 ~ 350 gf.cm
2.9	Bushing & Nut tight strength 軸套螺母緊固強度		5.0Kgf.cm

3 ENDURANCE CHARACTERISTICS 耐久性能

Item	Content 項目	Test Condition 測試條件	Specification 規格
3.1	Solder ability 焊錫性	The terminals shall be stored at a temperature of 100°C with relative humidity of 90~95% 16hours. After which measurements to shall be made. 溫度 100°C 濕度 90~95%RH , 16 小時測定。 The terminals shall be immersed into solder bath at $245\pm 10^\circ\text{C}$ for $3\pm 0.5\text{s}$. 端子在 $245\pm 10^\circ\text{C}$; 溫度的焊錫槽內浸錫 3 ± 0.5 秒	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed. 浸漬面須有 95%以上焊錫付著

Item	Content 項目	Test Condition 測試條件	Specification 規格															
3.2	Resistance to soldering heat 焊錫耐熱性	Immersion depth : up to the surface of the board Thickness of beat shunt (Printed wiring board : 1.6mm 浸漬深: 至基板面; P.C.B 板(基板)厚度: 1.6mm Material : single side copper clad laminate 材料: 單面銅箔積層板 溫度: 260±5°C 時間: 4sec max Soldering iron method 手焊條件: Bit temperature 溫度: 380±10°C Application time of soldering iron 時間: 3 sec max	Change in total resistance is relative to the value before test : ±5% Without deformation of case or terminals,Electrical characteristics shall be satisfied. 總阻變化值: ±5% 外觀無變形, 端子無鬆動, 電氣性能滿足規定要求.															
3.3	Dry heat 耐熱性	The potentiometer shall be stored at a temperature of 70±2°C for 96 hours in a thermostatic chamber. Then the potentiometer shall be maintained at standard atmospheric conditions for 1 hours , after which measurements shall be made. 溫度 70±2°C 恒溫槽中 96 小時放置後,置於常溫常濕 1 小時除去水滴後測定。	Change in total resistance is relative to the value before test : +5-30% 總阻變化值: 初期值的+5-30%															
3.4	Cold 耐寒性	The potentiometer shall be stored at a temperature of -20±3°C for 96 hours in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1h ,after which measurement shall be made. 溫度-20±3°C 恒溫槽中 96 小時放置後, 置於常溫常濕 1 小時除去水滴後,1 小時內測定。	Change in total resistance is relative to the value before test : ±20% 總阻變化值: 初期值的±20%															
3.5	Damp heat 耐濕性	The potentiometer shall be stored at a temperature of 40±2°C, with relative humidity of 90% to 95% for 96±4hours in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. and then the potentiometer shall be subjected to standard atmospheric conditions for 1h,after which measurement shall be made. 溫度 40±2°C,濕度 90-95%,恒溫恒濕槽中放置 96±4 小時後,置於常溫常濕 1 小時除去水滴後,1 小時內測定。	Change in total resistance is relative to the value before test : +35-5% 總阻變化值: 初期值的+35-5% Insulation resistance: 20MΩ or more 絕緣阻抗: 20MΩ以上 Noise : 150mV less than 轉動噪音: 150mV 以下															
3.6	Change of temperature 溫度循環試驗	The potentiometer shall be subjected to 5 successive change of temperature cycles, each as shown in table below. Then is surface moisture shall be removed .And then the potentiometer shall be subjected to standard atmospheric conditions for 1hour after which measurements shall be made。 以下條件溫度連續 5 個周期的試驗後,置於常溫常濕 1 小時除去水滴後,1 小時內測定。	Change in total resistance is relative to the value before test : ±30% 總阻變化值: 初期值的±30% Insulation resistance: 50MΩ or more 絕緣阻抗: 50MΩ以上 Dielectric strength : Without damage to parts arcing or breakdown etc. 耐電壓:無損傷,變形,絕緣破壞等情形。 Appearance: There shall be no form or cracks of molded part. 外觀: 塑膠部分無形成破裂															
		<table border="1"> <thead> <tr> <th>NO.</th> <th>Temperature 溫度</th> <th>Duration 放置時間</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25±3°C</td> <td>30 min</td> </tr> <tr> <td>2</td> <td>standard atmospheric conditions 常溫</td> <td>10 to 15 min</td> </tr> <tr> <td>3</td> <td>70±2°C</td> <td>30 min</td> </tr> <tr> <td>4</td> <td>standard atmospheric conditions 常溫</td> <td>10 to 15 min</td> </tr> </tbody> </table>	NO.	Temperature 溫度	Duration 放置時間	1	-25±3°C	30 min	2	standard atmospheric conditions 常溫	10 to 15 min	3	70±2°C	30 min	4	standard atmospheric conditions 常溫	10 to 15 min	
NO.	Temperature 溫度	Duration 放置時間																
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Item	Content 項目	Test Condition 測試條件	Specification 規格
3.7	Endurance 耐久性	The moving contact, without electrical load, shall be rotated from one end stop to the other and returned to its original position extended over 90° or more effective angle。 This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour. A lot of 10,000 cycles. Measurements shall be made immediately after 5,000cycles, immediately after 10,000cycles。軸以 600 周/小時(來回算 1 周)的速度旋轉,有效旋轉角度超過 90°,共 10,000 周.測試中 5,000, 10,000 周各測定一次。	Change in total resistance is relative to the value before test : ±15% 總阻變化值: 初期值的±15% Noise : 150mV less than 轉動噪音: 150mV 以下 Rotational torque shall not deviate from the previously specified value. 回轉力矩滿足初期值 End resistance is relative to the value before test : 200Ω less than. 殘留電阻: ≤200Ω
3.8	Storage Temperature Range	儲藏溫度範圍	-20~+80°C
3.9	Operation Temperature Range	使用溫度範圍	-10~+70°C

可變電阻無鉛焊錫規格書

Common Specification of Lead-Free Soldering for potentiometers

以下焊錫條件可變電阻置於單層 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. 手工焊錫條件:

For Manual Soldering:

1-1 操作溫度最高 $380 \pm 10^{\circ}\text{C}$, 操作時間 3 秒以內。

To be performed within 3 seconds at $380 \pm 10^{\circ}\text{C}$ or below.

2. 自動或半自動機台焊錫條件:

For Automated or semi-Automated Soldering Equipments:

2-1 使用發泡式比重 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,助焊劑不可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.

2-2 預熱時間不超過兩分鐘,焊錫介面(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 .

2-3 焊錫過程機台設定溫度在 $260 \pm 5^{\circ}\text{C}$ 以下, 4 秒以內。

Solder dipping is to be performed within 4 seconds at $260 \pm 5^{\circ}\text{C}$ or below.

3. 若迴轉型電位器是塑膠軸且帶有檔位,請將主軸調整至其中一個檔位或中心檔位上才可以進行焊錫作業。

For rotary potentiometer with plastic shaft which have center detent or multiple detents, the shaft should be settled in relevant detent position prior to soldering process.

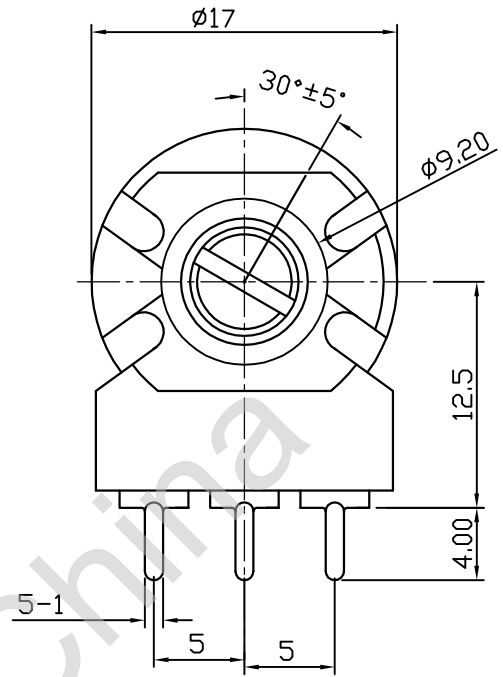
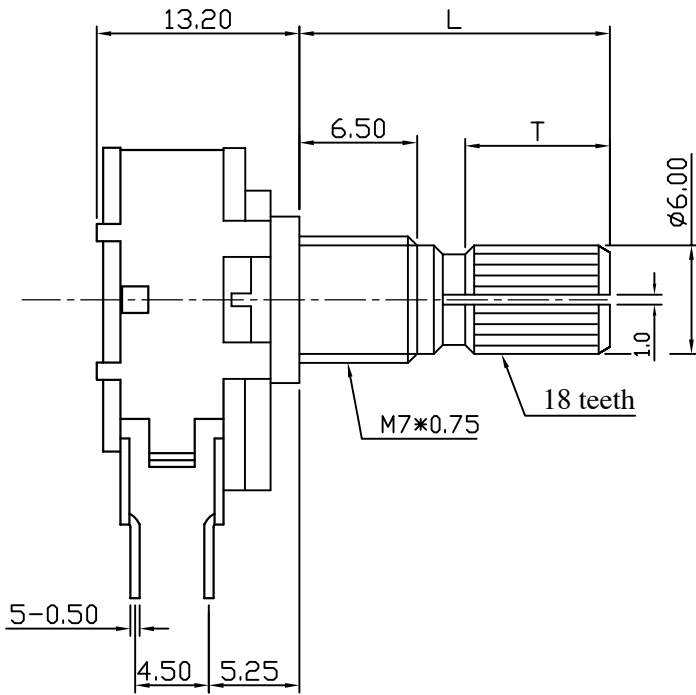
4. 手工焊錫,自動或半自動機台焊錫不能超過一回。

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

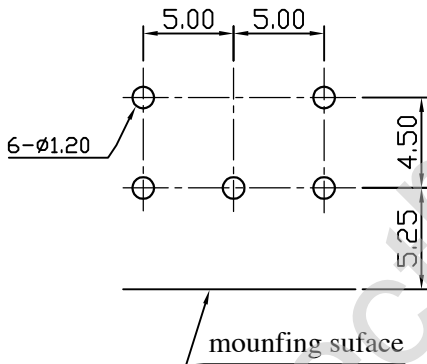
5. 該產品不適用於回流焊錫作業設備。

This specification is not recommended for and applicable in reflow soldering.

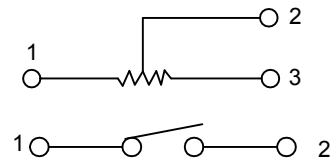
Mechanical Dimensions



Mounting Hole

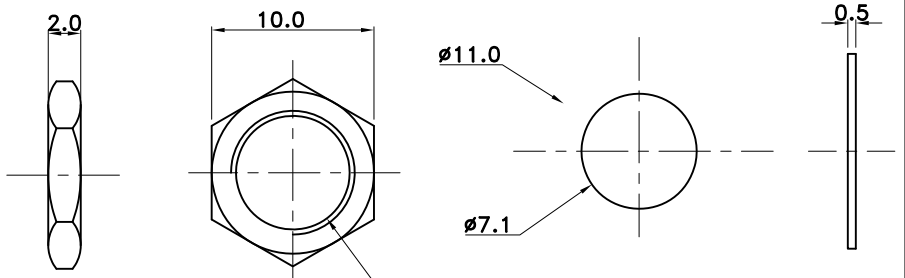


Circuit Explanation



Nut 螺母(可选项)

Washer 垫圈(可选项)



KQ TYPE:

X	0	1	2	3	4	5	7
L	10	12	15	20	25	30	17
T	2	3.5	6	10	12	12	7

TOLERANCES UNLESS OTHERWISE SPEC	
BASIC DIMENSIONS	TOLERANCES
UP TO 10	± 0.3
ABOVE 10 TO 30	± 0.5
ABOVE 30 TO 100	± 1.0
ANGULAR DIMENSION	± 5°

ELECTRONICS CHINA		APPRO	CHECK	DESIGNER
MODEL NO	R1620S- <input type="checkbox"/> A1-B220K-GP			程 鹏 2021.06.15
DESCRIPTION	Rotary Potentiometers			

Electrical Characteristics

Resistance Taper Characteristics

Resistance Taper Characteristic		Test Point Rotation							
		10%	20%	30%	50%	60%	70%	80%	90%
A	05A (G)	—	—	—	2 — 10%	—	—	—	—
	10A (D)	—	—	—	5 — 16%	—	—	—	—
	15A (A)	—	—	—	10 — 25%	—	—	—	—
	20A	—	—	—	15 — 30%	—	—	—	—
	25A (K)	—	—	—	19 — 33%	—	—	—	—
	30A	—	—	—	29 — 40%	—	—	—	—
B	0B	—	—	—	40 — 60%	—	—	—	—
	1B	0.2-4%	—	—	40 — 60%	—	—	—	96-99.8%
	2B	—	2-10%	—	40 — 60%	—	—	90-98%	—
	3B	—	1-7%	—	40 — 60%	—	—	93-99%	—
	4B(W)	—	—	5-15%	40 — 60%	—	85-95%	—	—
	5B	—	—	1-7%	40 — 60%	—	93-99%	—	—
C	05C	—	—	—	2 — 10%	—	—	—	—
	10C (RD)	—	—	—	5 — 16%	—	—	—	—
	15C (C)	—	—	—	10 — 25%	—	—	—	—
	20C	—	—	—	25 — 30%	—	—	—	—
	25C (E)	—	—	—	19 — 33%	—	—	—	—
	30C	—	—	—	25 — 40%	—	—	—	—

