# 12Ø 單軸單連回轉式可變電阻器制品規格書

## 12Ø SINGLE SHAFT SINGLE UNIT ROTARY POTENTIOMETERS SPECIFICATIONS

### 1. 一般事項 General

1.1 適用範圍: 此規範適用于電子機器之可變電阻器.

Application: This specification is applied to potentiometers used for electronic equipment .

1.2 使用溫度範圍 Operating temperature: -10~+70℃

1.3 保存溫度範圍 Storage temperature range: -30~+70℃

1.4 試驗狀態: 若無特別規定限制, 則以溫度5~35℃, 相對濕度45~85%, 氣壓860~1060mbar之標準狀態測之. 但對此標準狀態之測定值發生判定疑問或有特別要求則以基準狀態(溫度20±2℃,相對濕度65 ±5%,氣壓860~1060mbar)為準測定 .

Test conditions : the standard test conditions shall be 5~35℃ in temperature ,45~85%RH and 860~1060mba i atmospheric , should any doubt arise in judgement , tests shall be conducted at 20±2℃ , 65±5%RH and 860~106

1.5 試驗狀態:為避免保管場所環境引起端子變色, 未到使用之前, 請勿拆封, 端子變色保證期限出貨後3個月內.

Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods at most。

### 2. 構造、尺寸 Construction and dimensions 依組立圖 Refer to attached drawing

### 3. 電氣性能 Electrical characteristics

| NO. | 項 目<br>Item | 試 驗 條 件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 3–1 | 全阻抗值<br>Total resistance | 軸置于端子1或3終端, 測定端子1-3間的阻抗值<br>Measurement shall be made by the resistance between terminal 1 and 3 with shaft setted at terminal 1 or 3 . | R<250KΩ許容差±20%<br>R≧250KΩ許容差±30%<br>R<250KΩTolerance ±20%<br>R≧250KΩTolerance ±30% |
| 3–2 | 額定電力<br>Power rating | 端子1和3間所能連續負荷之最大電力<br>Power rating is based on continuous full load operation at the maximum voltage between terminal 1 and terminal 3 . | 0.05W |
| 3–3 | 額定電壓<br>Rated voltage | 額定電壓 Rated voltage $E=\sqrt{PR}$ (V)<br>額定電力 P: Power rating (W)<br>公稱全阻抗值R: Nominal total resistance (Ω)<br>當額定電壓超過最高使用電壓的時候,<br>最高使用電壓即為額定電壓 .<br>When the rated voltage exceeds the maximum operating voltage , the maximum operating voltage shall be the rated voltage . | |
| 3–4 | 最高使用電壓<br>Max operating voltage | | A.C 50V<br>D.C 10V |

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| NO. | 項目 Item | 試驗條件 Test conditions | | | | 規格 Specifications |
|---|---|---|---|---|---|---|
| 3–5 | 阻抗變化特性 Taper | 電壓法測定<br>*記號表示第3端子測起<br>Measurement shall be made by the resistance law Method.<br>*With respcct to torminal 3 | | | | |
| | | 變化特性 taper | 測定位置 test point | V1-2 / V1-3 | V2-3 / V1-3 | |
| | | 10A | 150° | ∨ | — | 6~15% |
| | | 15A | 150° | ∨ | — | 10~25% |
| | | 25A | 150° | ∨ | — | 18~34% |
| | | 1B,2B | 150° | ∨ | — | 40~60% |
| | | 4B | 90 ±5° | ∨ | — | 5~15% |
| | | | 150° | ∨ | — | 40~60% |
| | | | 210 ±5° | ∨ | — | 85~95% |
| | | 10C | *150° | — | ∨ | 6~15% |
| | | 15C | *150° | — | ∨ | 10~25% |
| | | 25C | *150° | — | ∨ | 18~34% |
| 3–6 | 殘留阻抗 Residual resistance | 滑動子置于全回轉角度的終端時, 端子1-2間, 端子2-3間的阻抗值測定.<br>The resistances at each end of the mechanical rotation between terminal 1 and 2, terminal 2 and 3 shall be measured. | | | | |
| | | 公稱全阻抗值(KΩ) Nominal total resistance (KΩ) | | | | |
| | | R≦10 | | | | 20Ω MAX. 20Ω以下 |
| | | 10<R<50 | | | | 30Ω MAX. 30Ω以下 |
| | | 50≦R≦1000 | | | | 全阻值的0.1%以下<br>0.1%MAX of total resistance |
| 3–7 | 旋轉雜音 Rotational noise | 端子1-3間印加直流電壓20V(額定電壓20V以下時, 則印加此額定電壓), 以30回/分的轉速所測定之雜音.<br>Applying 20V D.C between the terminals 1 and 3 (When the rated voltage is small than the 20V D.C, it shall be applied the rated voltage.)<br>And then the noise shall be measured by the specified speed 30 cycles / min. | | | | 100mV 以下<br>100mV MAX. |

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| NO. | 項 目<br>Item | 試驗條件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 3–8 | 絕緣阻抗<br>Insulation resistance | 施加 250V之直流電壓, 1分鐘後測試.<br>測試位置: 端子和固定板之間<br>Test voltage : 250V D.C measure after 1 min<br>Test position : Between terminal and Attaching plate | 100MΩ 以上<br>100MΩ MIN. |
| 3–9 | 耐電壓<br>Voltage proof | 以300V之交流電壓, 測試1分鐘<br>測試位置: 端子和固定板間<br>Applying 300V A.C measure for 1 min.<br>Applied position : Between terminal and Attaching plate | 不可有損傷, 電弧, 絕緣, 破壞<br>Without damage to parts arcing or breakdown. |

**4. 機械性能: Mechanical characteristics**

| NO. | 項 目<br>Item | 試驗條件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 4–1 | 全回轉角度<br>Total rotational angle | | 300° ±5° |
| 4–2 | 回轉轉矩<br>Operating torque | 回轉速度60°/秒, 但指針之瞬間下滑不計<br>Rotational speed 60°/sec, but torque meter indicator dropping in an instant shall be excepted. | 50gf-cm以下 (MAX) |
| 4–3 | 軸松動<br>Shaft wobble | 在固定狀態，軸前端加上500gf-cm之力矩。<br>The potentiometer is fixed condition a torsion moment of 500gf-cm shall be applied at the end of shaft. | 0.7xL/30 mm p-p 以下 (MAX)<br>L：軸受固定面至施力點之距離。<br>L：measurement point from mounting surface of bushing. |
| 4–4 | 軸擠壓引張強度<br>Shaft push - pull strength | 在軸的擠壓和引張方向各施加8Kgf 10 秒<br>Push and pull static load 8Kgf shall be applied in the shaft direction for 10 sec. | 電氣性能須滿足<br>Electrical characteristics shall be satisfied. |
| 4–5 | 軸回轉止動強度<br>Shaft end stop strength | 在1端子側或3端子側施加回轉力矩3Kgf-cm,1秒鐘。<br>A torsion moment of 3Kgf-cm shall be applied at shaft in terminal 1 or terminal 3 for l sec. | 操作部和關連部不可有變形、破損<br>Without deformation or breaks in the operating part and contact part |
| 4–6 | 軸承固定強度<br>Nut tightening strength | | 10Kgf-cm 以上, 在10Kgf-cm以下使用<br>10Kgf-cm MIN.<br>Don't over 10Kgf-cm when operating. |

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| NO. | 項目 Item | 試驗條件 Test conditions | | 規格 Specifications |
|---|---|---|---|---|
| 4-7 | 焊錫耐熱 Resistance to soldering heat | ※DIP焊錫條件：<br>Condition of DIP soldering：<br>1.浸漬焊錫處理時,請確保在下列條件下作業：<br>Soldering shall be certified with following condition | | 全阻抗值變化在初期的±5%以內,<br>端子不可有接觸不良或明顯松動<br>Change in total resistance is relative to the value before test ±5% .<br>Without excessive looseness of terminals and failure contact . |
| | | 預熱溫度 Preheat temperature | (印刷基板之RV固定面溫度)<br>100℃以下,2分鐘以內。(Surface temperature of mounting side) 100℃ MAX Within 2 MIN. | |
| | | 焊錫溫度 Solder temperature | 260℃±5℃，5秒以內。<br>260℃±5℃, Within 5 sec. | |
| | | 手焊溫度 Manual solder temperature | 350℃±5℃，3秒以內。<br>350℃±5℃, Within 3 sec. | |
| | | 2.以上工程1回通過即可。<br>Please use the above process only one times. | | |

### 5. 耐久性能 Endurance

| NO. | 項目 Item | 試驗條件 Test conditions | 規格 Specifications |
|---|---|---|---|
| 5–1 | 回轉壽命 Rotational life | 無負荷狀態,軸回轉速度600回/小時,有效回轉角度的90%以上,總次數30,000回以上.<br>The moving contact without electrical load , shall be rotated form one end stop to the other end returned to its original position extend over 90% or more effective angle .<br>Rotation speed: 600 cycle / hour<br>Total cycles: 30,000 cycles | 全阻抗值的變化為初期值±15%以內<br>旋轉雜音：150mV以下<br>其它須滿足(3項) (4項)<br>Change in total resistance is relative to the value before test ±15% .<br>Noise : 150mV MAX<br>Clause (3), (4) shall be satisfied . |

### 6.開關電氣性能 Switch Electrical characteristics

| NO. | 項目 Item | 試驗條件 Test conditions | 規格 Specifications |
|---|---|---|---|
| 6–1 | 定格容量<br>(抵抗負荷)<br>Switch rating<br>(Resistor load) | | D.C.5V 10mA |

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| NO. | 項 目<br>Item | 試驗條件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 6–2 | 接觸阻抗<br>Contact resistance | 以D.C.定電流電壓降下法測定之。<br>Measured by decides the electric current D.C. voltage drop method. | 100 mΩ以下 (MAX) |
| 6–3 | 絕緣阻抗<br>insulation resistance | 外加D.C. 250V 於端子與固定板間。<br>Measurement shall be made under the condition which a voltage of 250V D.C. is applied between individual terminals and attaching plate. | 端子與固定板間100MΩ以上<br>Between individual terminals and attaching plate：100MΩ MIN. |
| 6–4 | 耐電壓<br>Dielectric strength | 端子與固定板間外加A.C. 300V 1分鐘或外加A.C.360V 2秒鐘測定。(Leak電流：1mA)<br>A voltage of 300V A.C. shall be applied for 1 min or a voltage of 360V A.C. shall be applied for 2 sec between individual terminals and attaching plate. (Leak current：1mA) | 無損傷，變形或絕緣破壞現象。<br>Without damage to parts arcing or breakdown. |

備註：軸與開關端子間絕緣。
Note：Shaft is insulated from switch terminal.

**7.開關機械性能 Switch Mechanical characteristics**

| NO. | 項 目<br>Item | 試驗條件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 7–1 | 操作方式<br>Switch operating method | | 推壓型<br>Push type |
| 7–2 | 開關回路, 接點數<br>Switch contact arrangement | | 單極單投（PUSH ON）<br>S.P.S.T (PUSH ON) |
| 7–3 | 開關移動量<br>Switching stroke | | 0.3 (±0.15) mm |
| 7–4 | 開關作動力<br>Switch strength | | 450±200 gf |

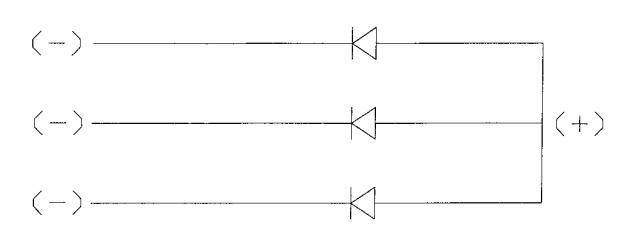
**8.開關耐久性能 Switch Endurance characteristics**

| NO. | 項 目<br>Item | 試驗條件<br>Test conditions | 規 格<br>Specifications |
|---|---|---|---|
| 8–5 | 操作壽命<br>Operating life | 無負荷狀態下動作20,000回。<br>The shaft of switch shall be 20,000 times without electronically load, after which measurements shall be made. | 接觸阻抗: 200mΩ以下<br>開關作動力：滿足初期規格值之+10%/-30%。<br>其它項目均需滿足初期規格值<br>Switch contact resistance：200mΩ MAX.<br>Switch strength：<br>Relative to the previously specified value +10%/-30%.<br>Except above items Specification in clause 6.1~4 and 7.1~4 shall be satisfied. |

# L. E. D. 共通規格書

# L. E. D. COMMON SPECIFICATIONS

## 一. 回路: Circuit:




## 二. LED 特性

LED Characteristic

1. 反轉電壓: 5V

   Reverse Voltage: 5V

2

| 發光色 Emitted color | | 功率消耗 Power dissipation (mW) | 直流下向電流 DC Forward Current (mA) | 試驗條件Test conditions IF=20mA 直流順電壓Forward voltage(V) | |
|---|---|---|---|---|---|
| | | | | 標准值Typ | 最大值MAX |
| 紅色/綠色/藍色 Red/Green/Blue | 紅色 Red | 60 | 25 | 2.0 | 2.4 |
| | 綠色 Green | 110 | 25 | 3.3 | 3.7 |
| | 藍色 Blue | 110 | 25 | 3.3 | 3.7 |

**ROHS COMPLIANCE**

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