

# 12mm 單軸單連回轉式可變電阻器製品規格書

## 12mm SINGLE SHAFT SINGLE UNIT ROTARY POTENTIOMETERS SPECIFICATIONS

### 1. 一般事項 General

1.1 適用範圍：此規範適用於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°C

1.3 保存溫度範圍 Storage temperature range : -30°C to +70°C

1.4 試驗狀態：若無特別規定限制，則以溫度5~35°C，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°C,相對濕度65±5%,氣壓860~1060mbar)為準測定。

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

1.5 保管條件:為避免保管場所的環境引起端子變色,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 Item	試驗條件 Test conditions	規格 Specifications
3-1	全阻抗值 Total resistance	軸置于端子1或3終端,測定端子1-3間的阻抗值 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% R≥250KΩ 許容差±30% R<250KΩ Tolerance ±20% R≥250KΩ Tolerance ±30%
3-2	額定電力 Power rating	端子1和3間所能連續負荷之最大電力 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 Rated voltage	額定電壓 Rated voltage $E=\sqrt{PR}$ (V) 額定電力 P: Power rating (W) 公稱全阻抗值R: Nominal total resistance (Ω) 當額定電壓超過最高使用電壓的時候, 最高使用電壓即為額定電壓。 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 Max operating voltage		A.C 48V D.C 10V

The letter after 12PL is refer to the LED color. Example: 12PLBXXX: B = blue LED

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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(*記號表示第3端子測起) Measurement shall be made by the resistance law method. (*With respct to torminal 3)							
		變化特性 taper	測定位置 test point	$\frac{V1-2}{V1-3}$	$\frac{V2-3}{V1-3}$				
		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。 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)							
		$R \leq 10$				20Ω MAX. 20Ω 以下			
		$10 < R < 50$				30Ω MAX. 30Ω 以下			
		$50 \leq R \leq 1000$				全阻值的0.1%以下 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。 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.) And then the noise shall be measured by the specified speed 30 cycles / min .				100mV 以下 100mV MAX.			
3-8	絕緣阻抗 Insulation resistance	施加 250V之直流電壓, 1分鐘後測試。 測試位置: 端子和固定板之間 Test voltage : 250V D.C measure after 1 min Test position : Between terminal and attaching plate.				100MΩ 以上 100MΩ MIN.			
3-9	耐電壓 Voltage proof	以300V之交流電壓, 測試1分鐘 測試位置: 端子和固定板間 Applying 300V A.C measure for 1 min . Applied position : Between terminal and attaching plate				不可有損傷, 電弧, 絕緣, 破壞 Without damage to parts arcing or breakdown .			
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### 4. 機械性能: Mechanical characteristics

NO.	項目 Item	試驗條件 Test conditions	規格 Specifications
4-1	全回轉角度 Total rotational angle		300° ±5°
4-2	回轉轉矩 Operating torque	回轉速度60° /秒, 但指針之瞬間下滑不計 Rotational speed 60° /sec, but torque meter indicator dropping in an instant shall be excepted .	10~100 gf-cm
4-3	軸 松 動 Shaft wobble	在固定狀態下, 軸前端加上 500gf-cm之力矩. The potentiometer is fixed condition a torsion moment of 500gf-cm shall be applied at the end of shaft.	0.7 x L/30 mm p-p 以下 0.7 x L/30 mm p-p MAX.
4-4	焊錫耐熱 Resistance to soldering heat	※DIP焊錫條件： Condition of DIP soldering： 1.浸漬焊錫處理時,請確保在下列條件下作業： Soldering shall be certified with following condition	
		預熱溫度 Preheat temperature	(印刷基板之RV固定面溫度) 100°C 以下.2分鐘以內。(Surface temperature of mounting side) 100°C MAX Within 2 MIN.
		焊錫溫度 Solder temperature	260°C±5°C, 5秒以內。 260°C±5°C, Within 5 sec.
		手焊溫度 Manual solder temperature	350°C±5°C, 3秒以內。 350°C±5°C, Within 3 sec.
		2.以上工程1回通過即可。 Please use the above process only one times.	
4-5	軸擠壓引張強度 Shaft push - pull strength	在軸的擠壓和引張方向各施加8Kgf 10 秒 Push and pull static load 8Kgf shall be applied in the shaft direction for 10 sec .	電氣性能須滿足 Electrical characteristics shall be satisfied .

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NO.	項目 Item	試驗條件 Test conditions	規格 Specifications
4-6	軸回轉止動強度 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 A torsion of 3Kgf-cm moment shall be applied at shaft in terminal 1 or terminal 3 for 1 sec.	操作部和關連部不可有變形、破損 Without deformation or breaks in the operating part and contact part
4-7	軸承固定強度 Nut tightening strength		10Kgf-cm以上 (MIN) (在10Kgf-cm以下使用。) (Don t over 10Kgf-cm when operating.)

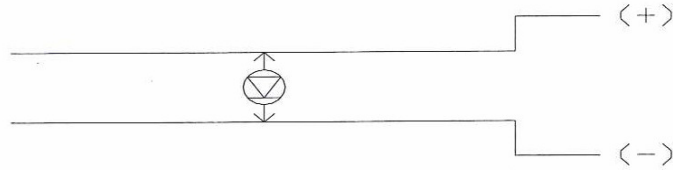
### 5. 耐久性能 Endurance

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15,000回以上。 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 . Rotation speed: 600 cycle / hour Total cycles: 15,000 cycles	全阻抗值的變化為初期值±15%以內 旋轉雜音：150mV以下 其它須滿足(3項) (4項) Change in total resistance is relative to the value before test ±15% . Noise : 150mV MAX Clause (3), (4) shall be satisfied .

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**L. E. D. 共通規格書**  
**L. E. D. COMMON SPECIFICATIONS**

**一. 回路: Circuit:**



**二. LED 特性**

LED Characteristic

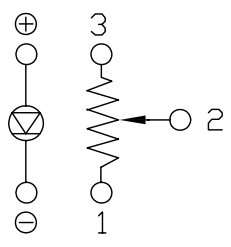
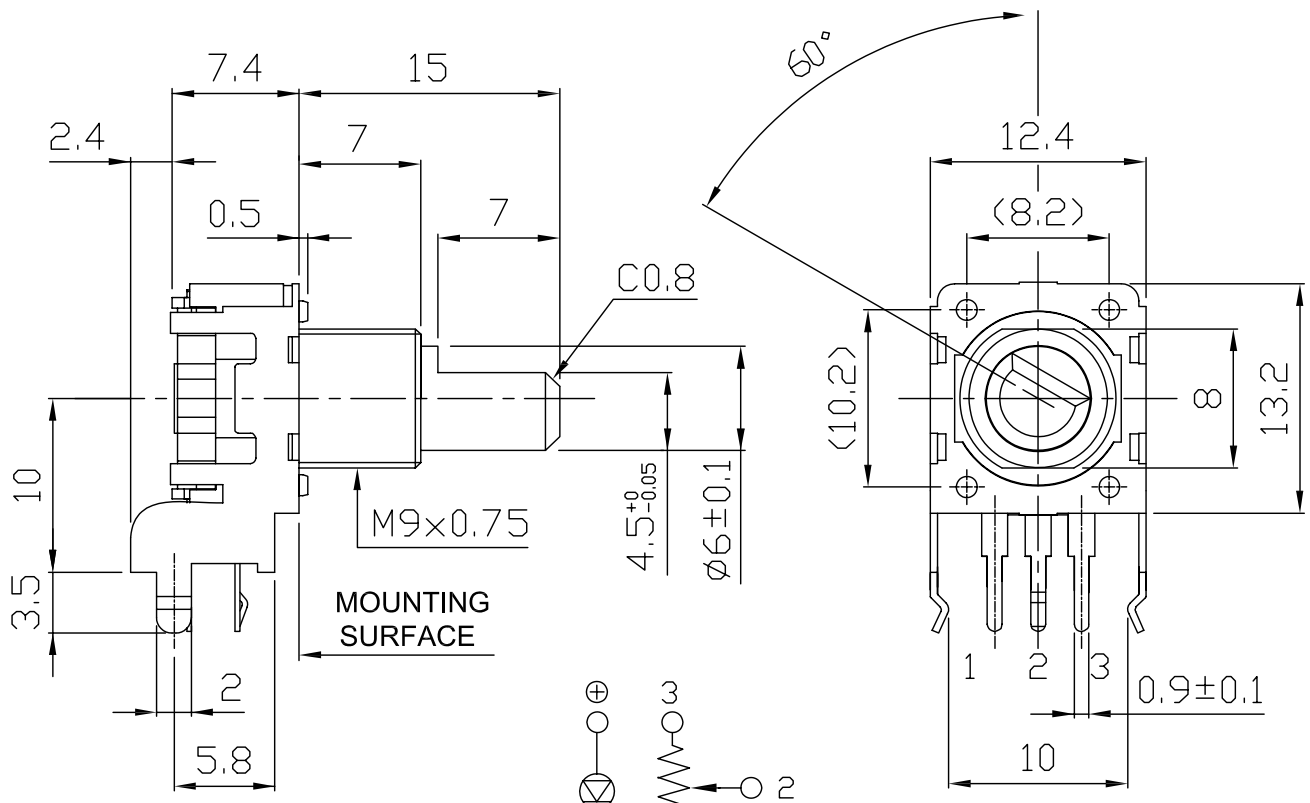
1. 反轉電壓: 5V  
Reverse Voltage: 5V

2

發光色 Emitted color	功率消耗 Power dissipation	直流正向電流 DC Forward Current	試驗條件 Test condintions IF=20 Ma	
			直流電順電壓 Forward voltage(V)	
			標準值 Typ	以下MAX
紅色 Red	60mW	30mA	1.8	2.6
草綠色 Lawngreen	100mW	30mA	2	2.6
藍色 Blue	72mW	20mA	3.2	3.6
橙色 Orange	100mW	30mA	2.1	2.6
深橙色 Darkorange	100mW	30mA	2.1	2.6
白光 White	72mW	20mA	3.2	3.6
綠色 Green	72mW	20mA	3.2	3.6

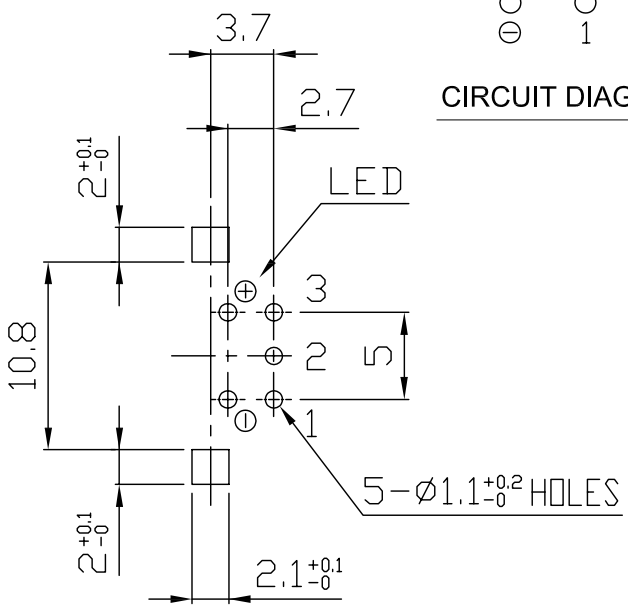
**ROHS COMPLIANCE**

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CIRCUIT DIAGRAM

SHAFT SHOWN IN FULL CCW POSITION



Mounting hole detail  
Viewed from mounting side  
(Tolerance : ±0.1)  
P.C.B t=1.6mm

**LED COLOR:**

CODE	COLOR
O	ORANGE
B	BLUE
R	RED
L	LAWNGREEN
A	DARKORANGE
W	WHITE
G	GREEN

**ROHS COMPLIANCE**

				MODEL NAME:	12PLB1HBF-B-15F-2B10K-002-6H		
				DRAWING NO.	12P-009		
				CODE NO.			
				PATH:	Pot.\Rotary\12mm\12P\Spec		
TOLERANCES		UNIT	SCALE	APPROVED SIGNATURES	DRAWN BY	CHECKED BY	APPROVED BY
less than 10	± 0.3	m/m	1 / 1		Ailsa	Nicole	余倩
above 10-100	± 0.5						
above 100	± 0.8	VERSION					
angular dimension	± 5°	D					
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