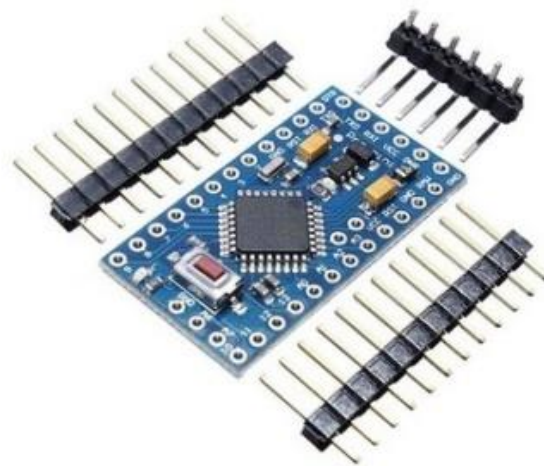


電光火石之路 LED焊接實作



焊接工具簡介

電烙鐵



錫筆



銅導線



烙鐵架



吸錫器



斜口鉗



電烙鐵使用步驟



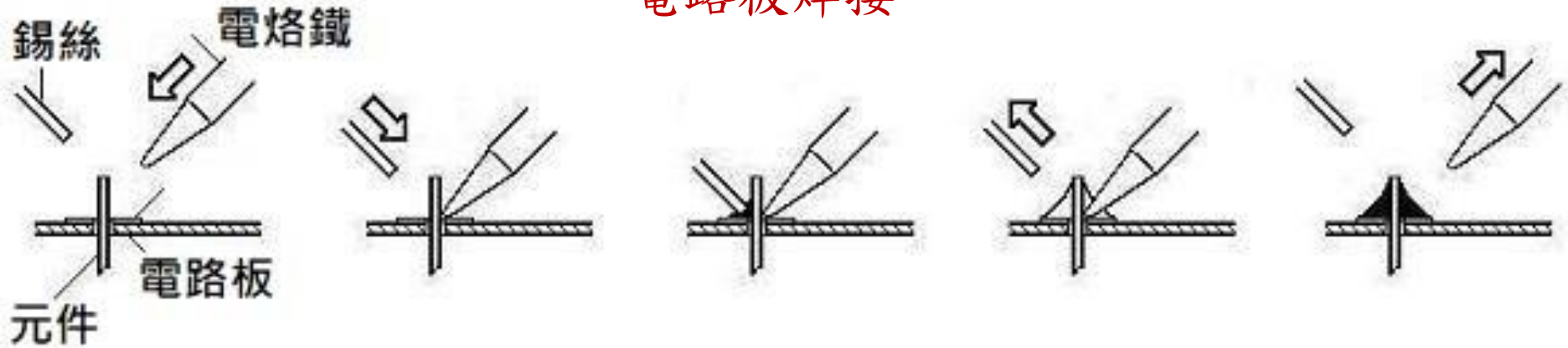
1. 一手拿錫筆，一手拿電烙鐵，將兩者緊依著要銲接的部位。
2. 等待焊錫熔化黏著於接點。
3. 等待焊錫凝固。

秘訣：焊錫熔化與凝固至少需要3到5秒，這期間手要穩住。

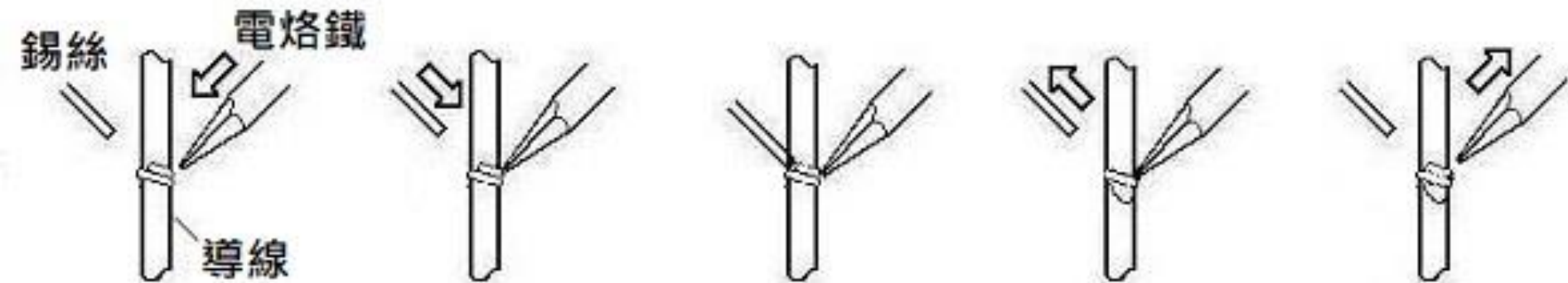
注意：電烙鐵溫度在 250°C 以上，請注意手別碰觸到！

電烙鐵焊接步驟

電路板焊接



導線焊接



焊接種類及虛焊

焊接種類



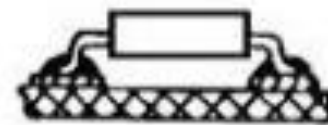
插焊



彎焊

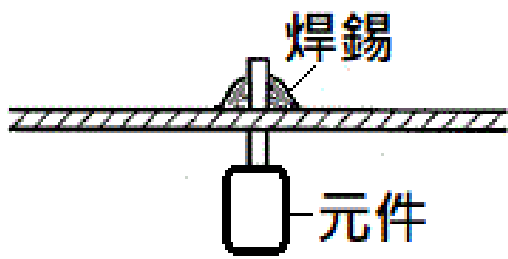


繞焊

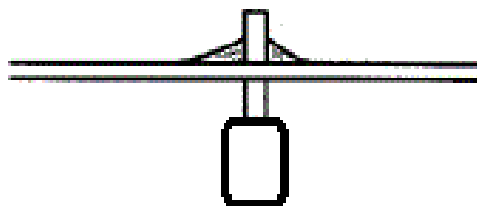


搭焊

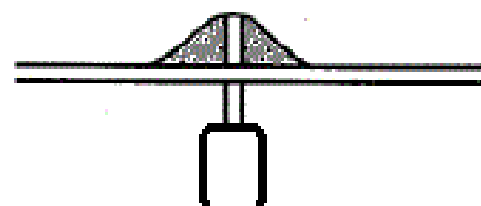
焊接量標準



合格



過少



過多

焊接實作-LED電路

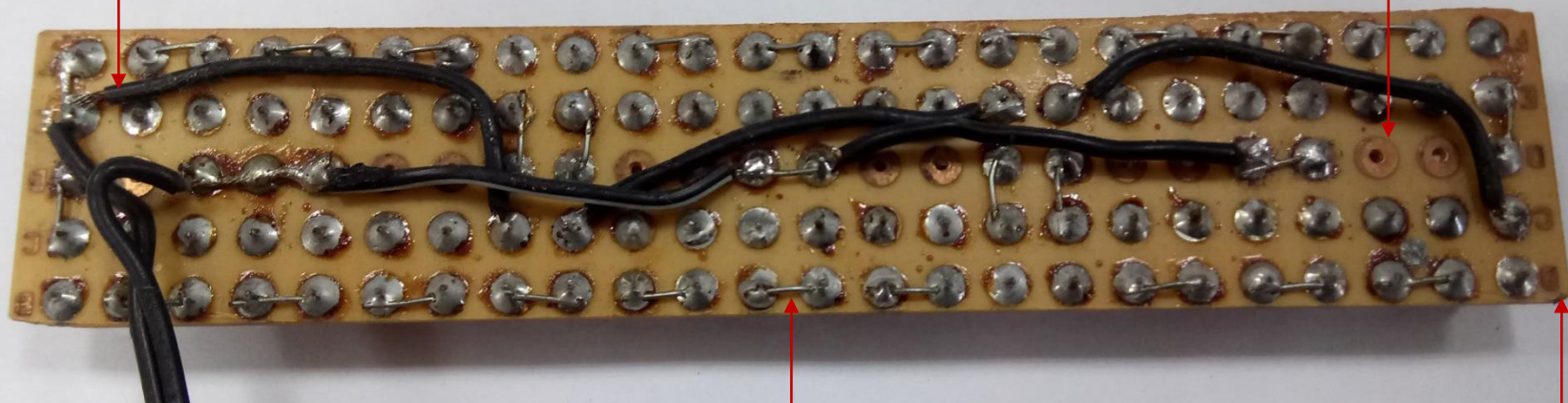
電阻

食人魚LED



多芯銅導線

銅箔圓孔



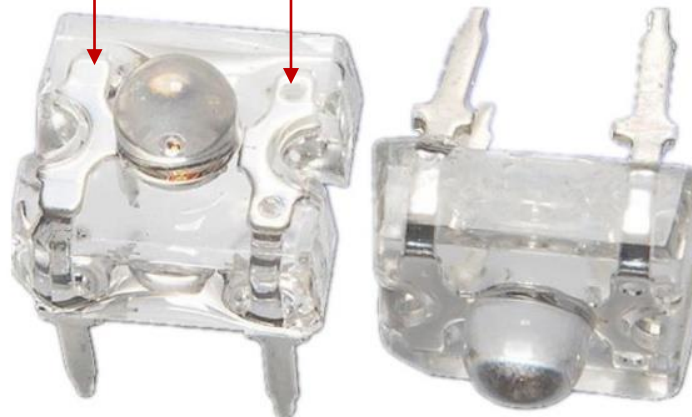
鍍錫銅線

洞洞板

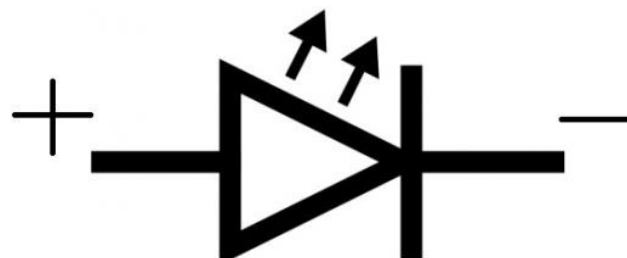
發光二極體LED



正極 負極

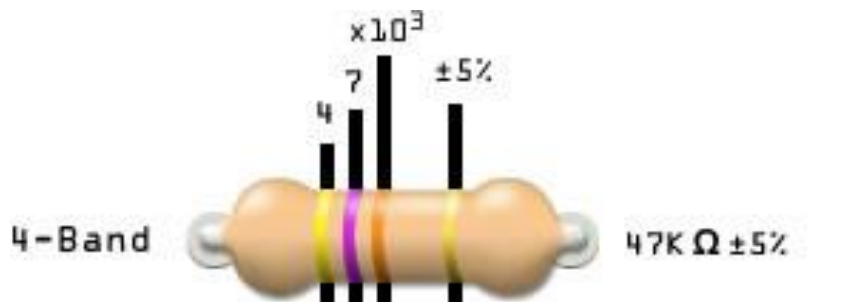


食人魚LED

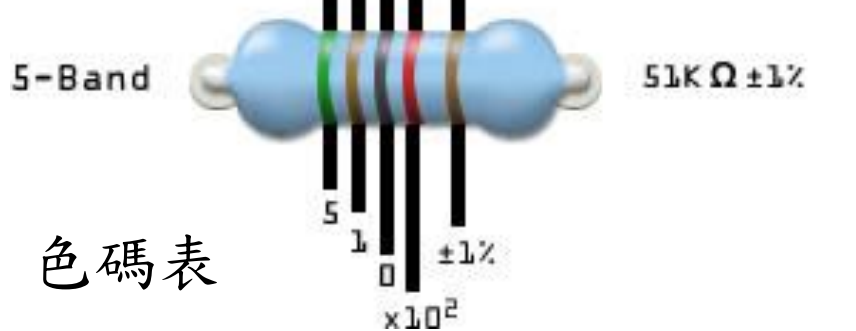


電路符號

固定電阻



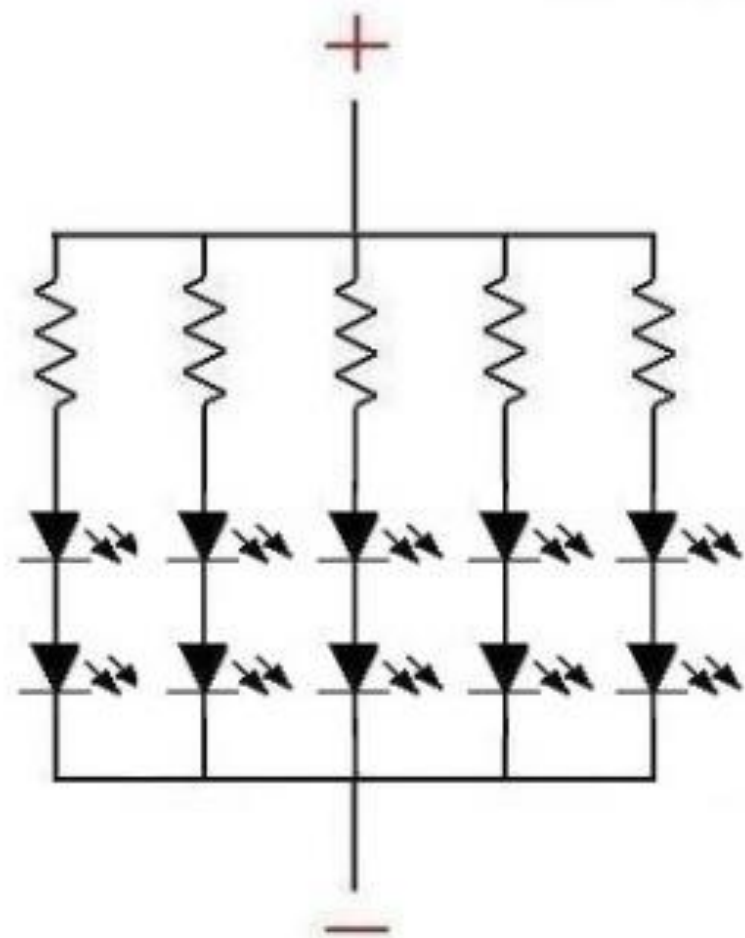
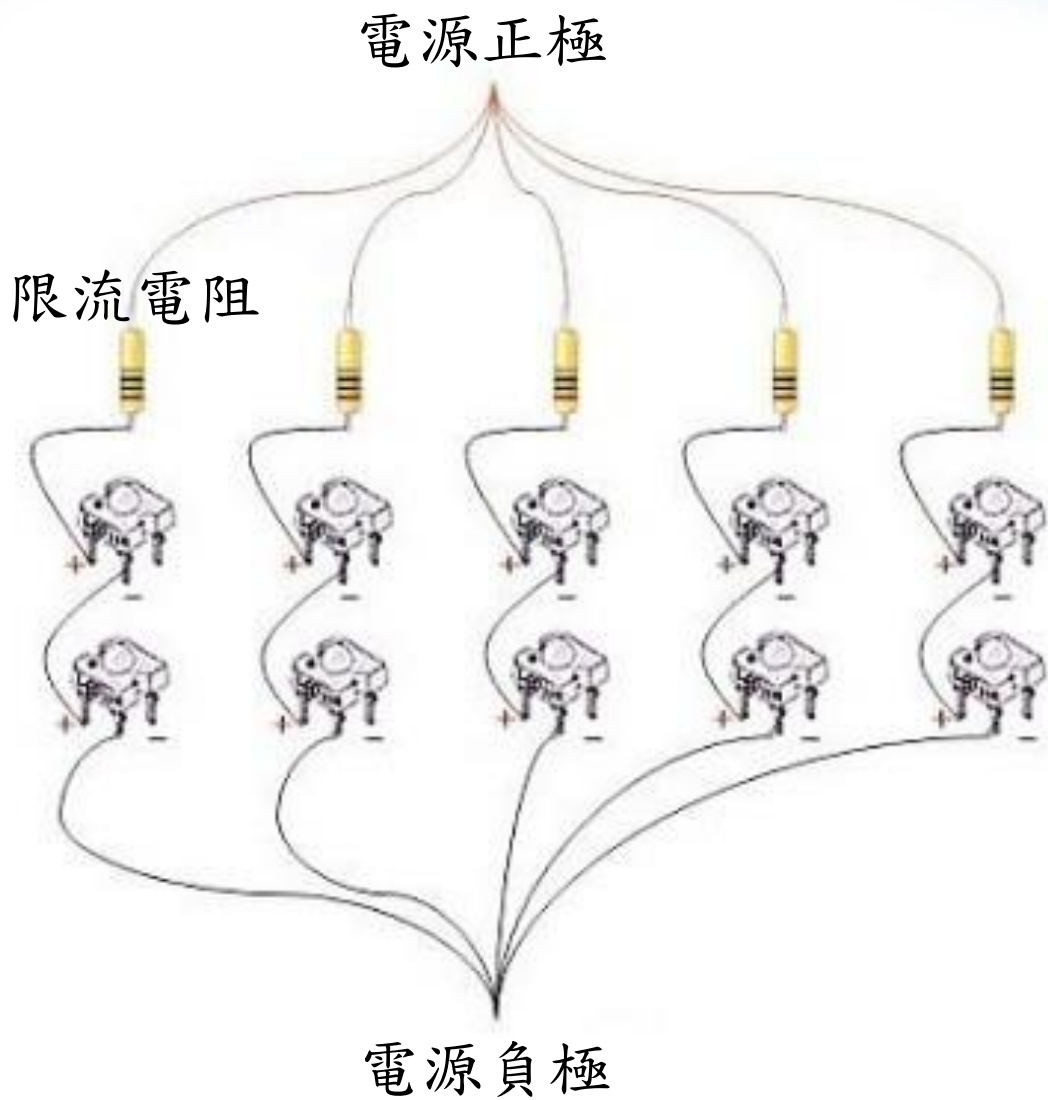
1st	2nd	3rd	Multiplier	Tolerance
0	0	0	$\times 10^0$	
1	1	1	$\times 10^1$	$\pm 1\%$
2	2	2	$\times 10^2$	$\pm 2\%$
3	3	3	$\times 10^3$	
4	4	4	$\times 10^4$	
5	5	5	$\times 10^5$	$\pm 0.5\%$
6	6	6	$\times 10^6$	$\pm 0.25\%$
7	7	7	$\times 10^7$	$\pm 0.1\%$
8	8	8	$\times 10^8$	$\pm 0.05\%$
9	9	9	$\times 10^9$	
			$\times 10^{-1}$	$\pm 5\%$
			$\times 10^{-2}$	$\pm 10\%$



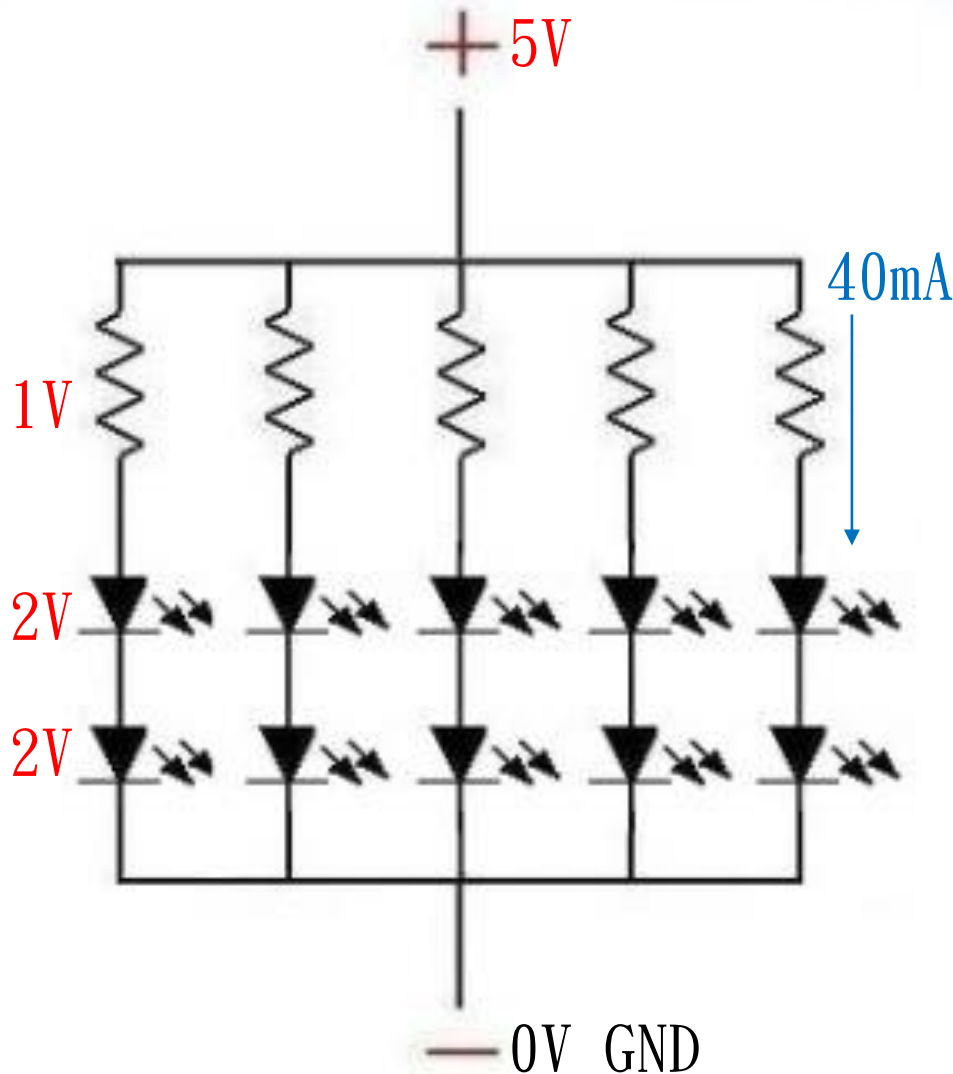
色碼表

同電阻值不同瓦數

LED 電路設計



限流電阻值計算-紅光LED



限流電阻功能：
與LED串聯，保護LED不被
過大之電流燒壞。

紅光LED特性：

單顆工作電壓：**2V**

單顆工作電流：**40mA**

依據歐姆定律：

$$\text{電阻 } R = \frac{\text{電壓 } V}{\text{電流 } I}$$

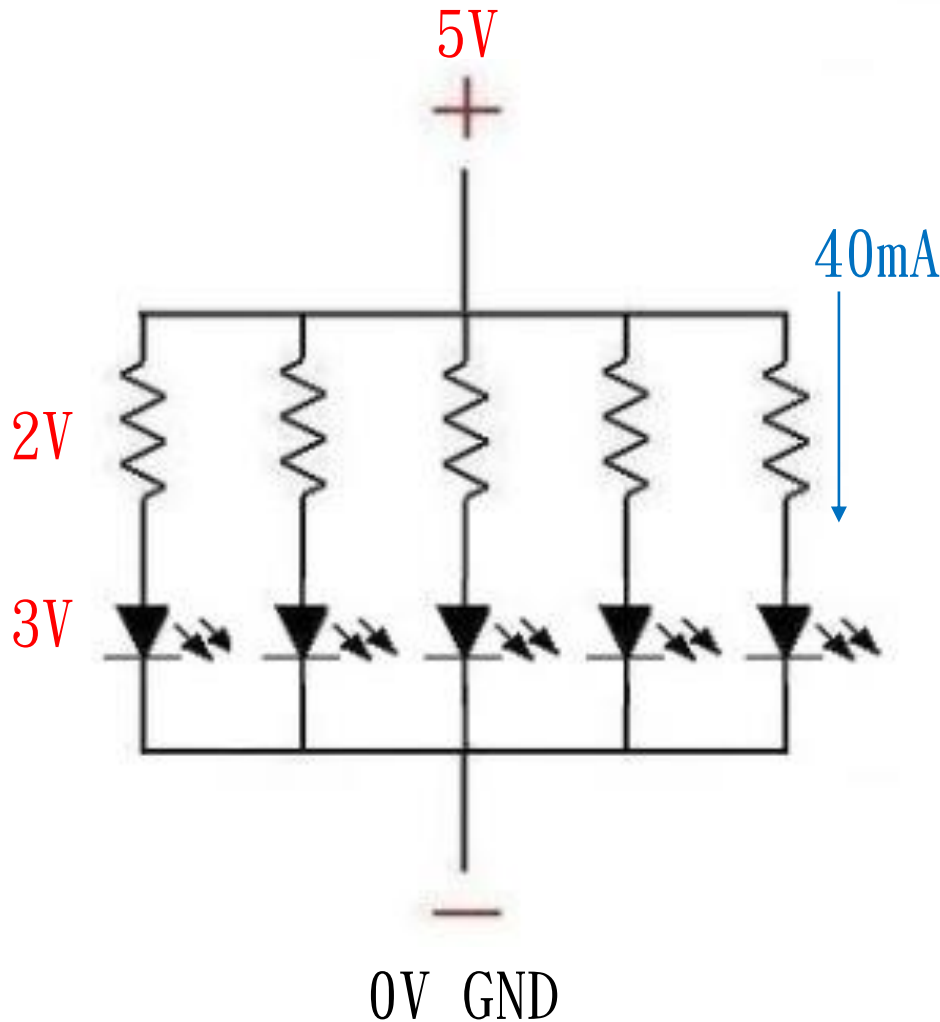
$$R = \frac{1V}{0.040A} = \mathbf{25\Omega}$$

依據電功率：

$$\text{功率 } P = \text{電流 } I \times \text{電壓 } V$$

$$P = 0.040A \times 1V = \mathbf{0.040W}$$

限流電阻值計算-白光LED



白光LED特性：

單顆工作電壓：**3V**

單顆工作電流：**40mA**

依據歐姆定律：

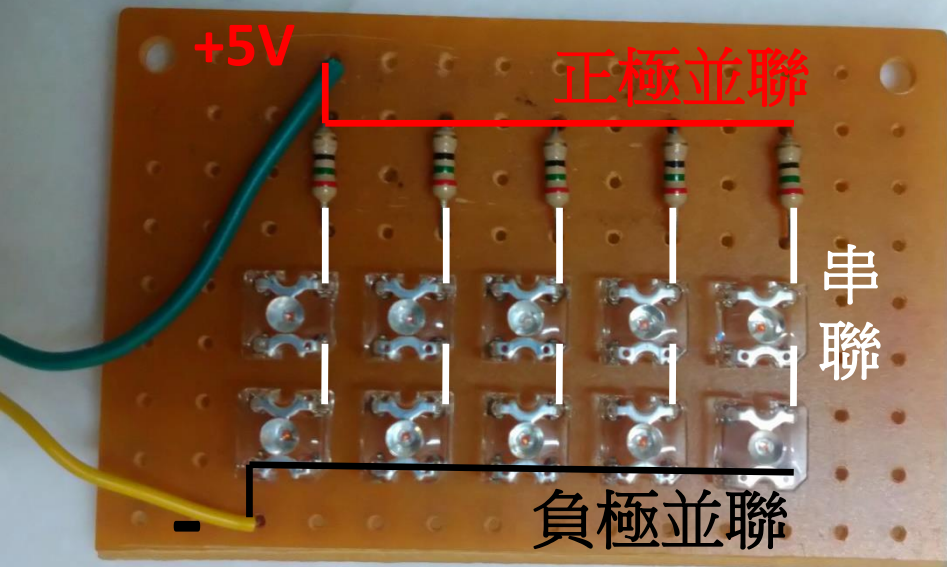
$$\text{電阻 } R = \frac{\text{電壓 } V}{\text{電流 } I}$$

$$R = \frac{2V}{0.040A} = \mathbf{50\Omega}$$

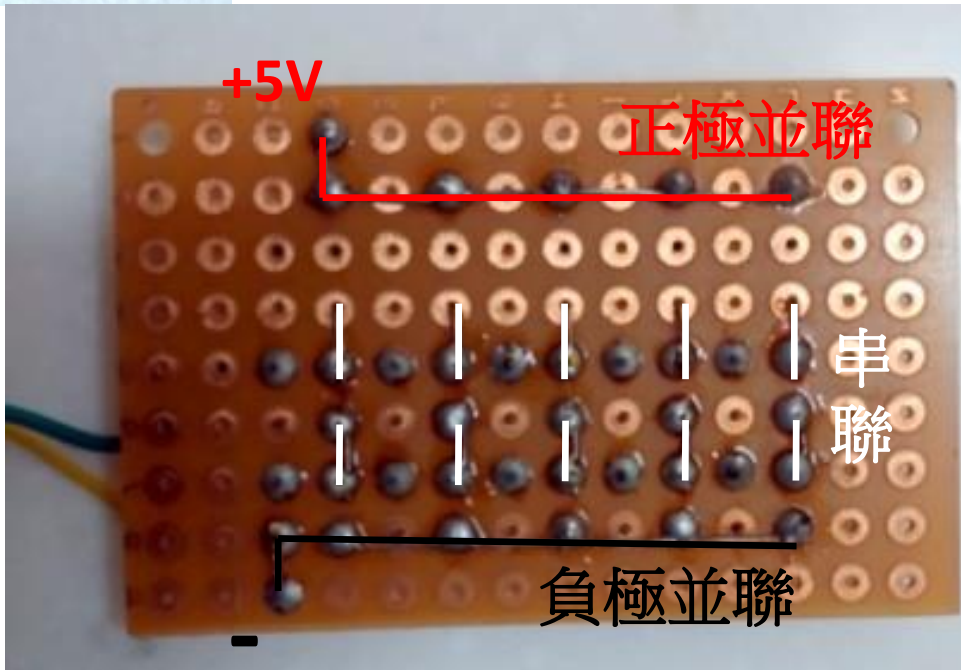
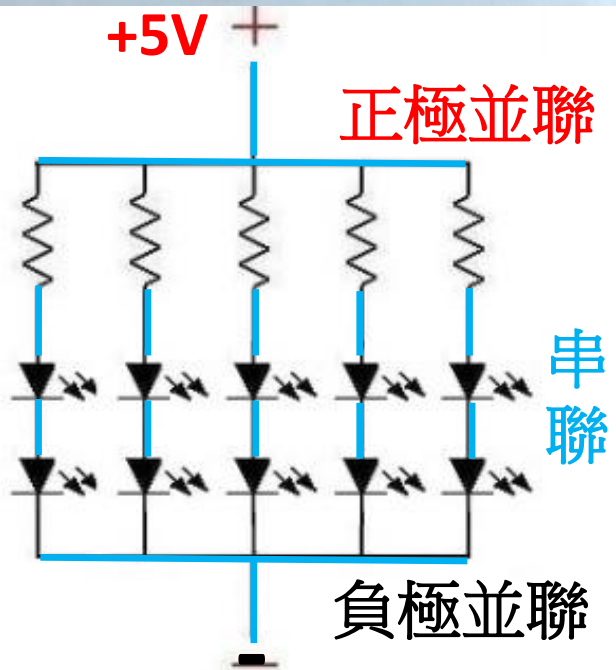
依據電功率：

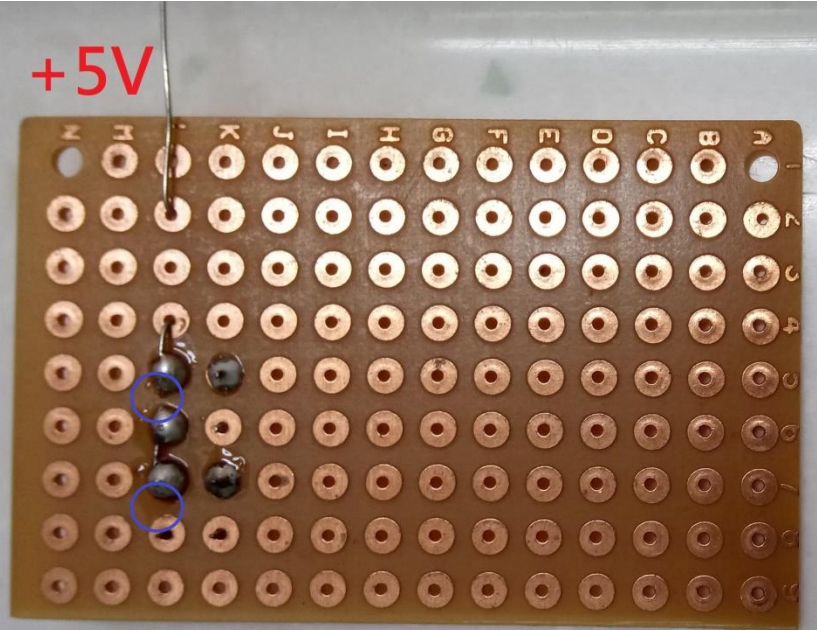
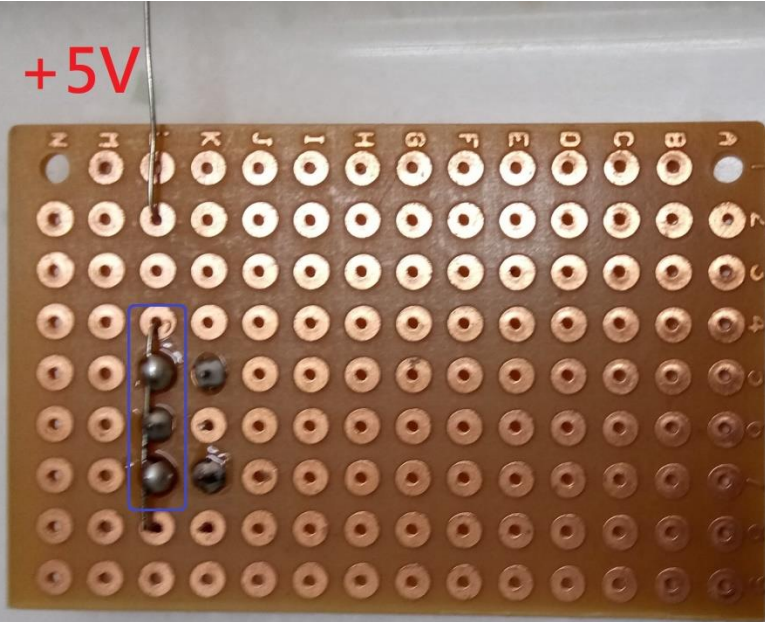
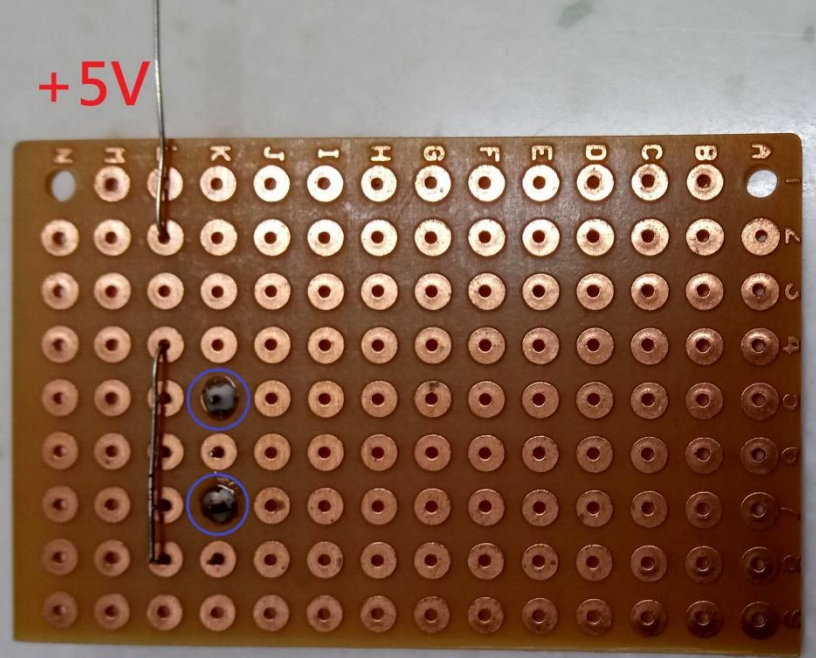
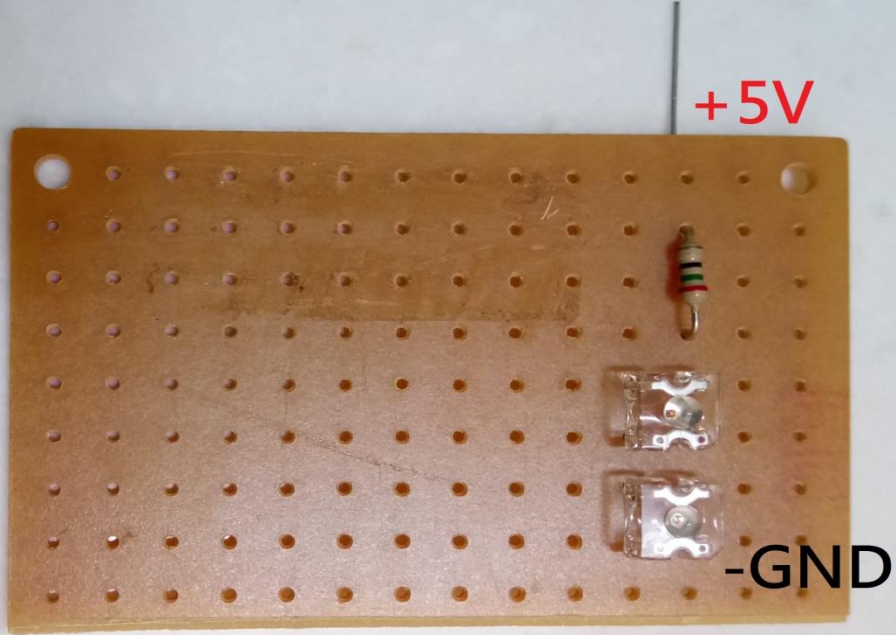
$$\text{功率 } P = \text{電流 } I \times \text{電壓 } V$$

$$P = 0.040A \times 2V = \mathbf{0.080W}$$

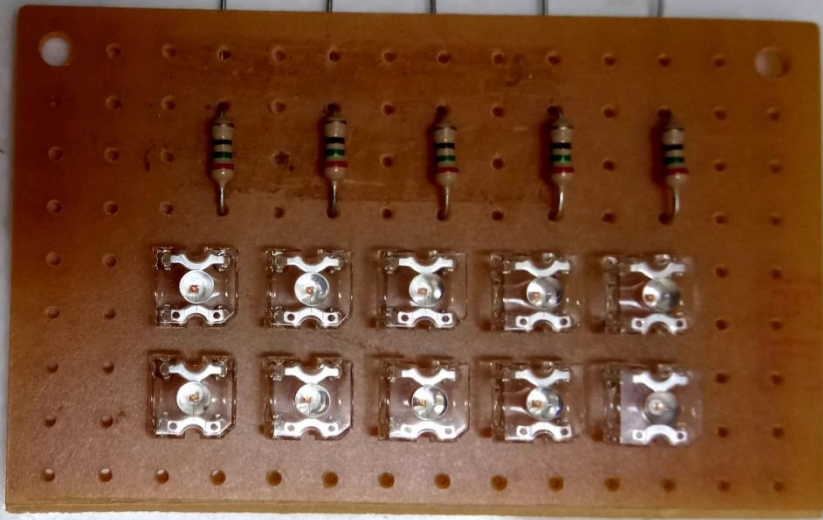


電路焊接 step by step

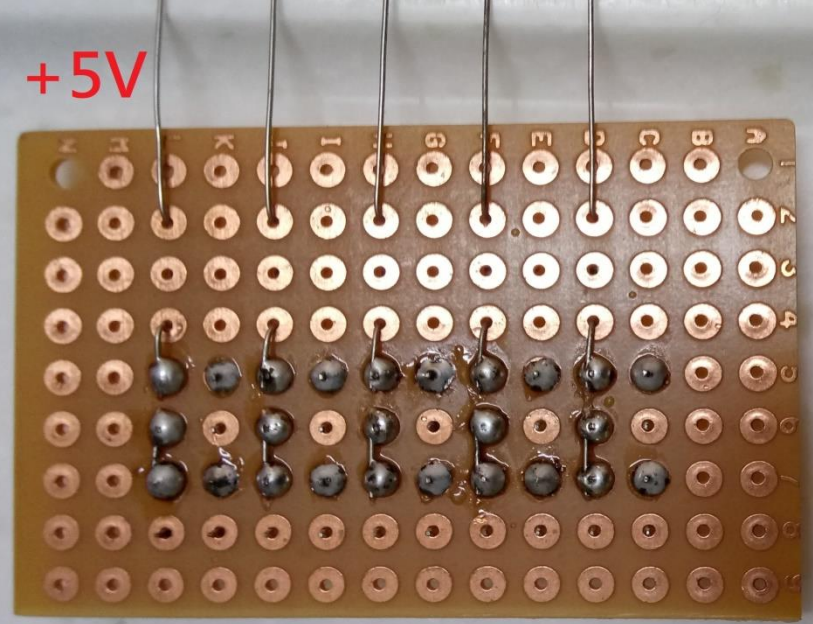




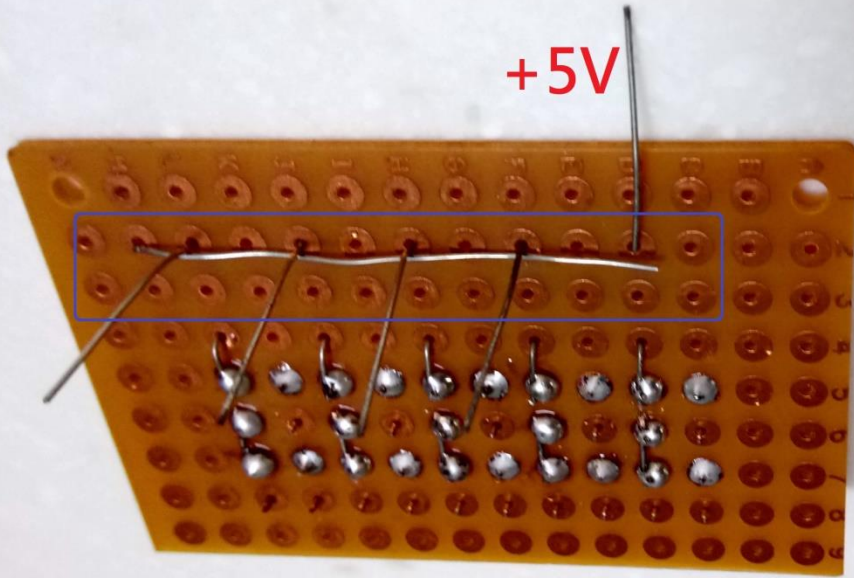
+5V



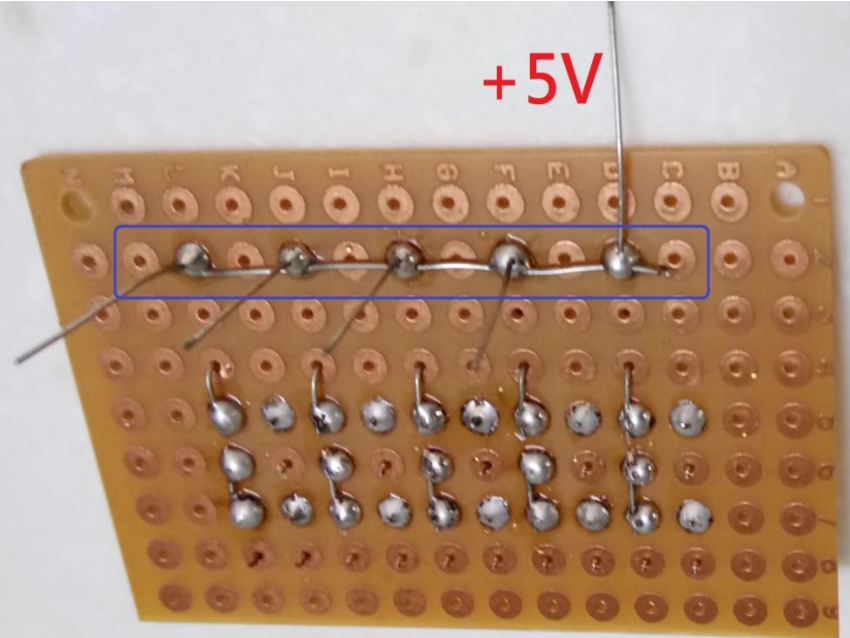
+5V



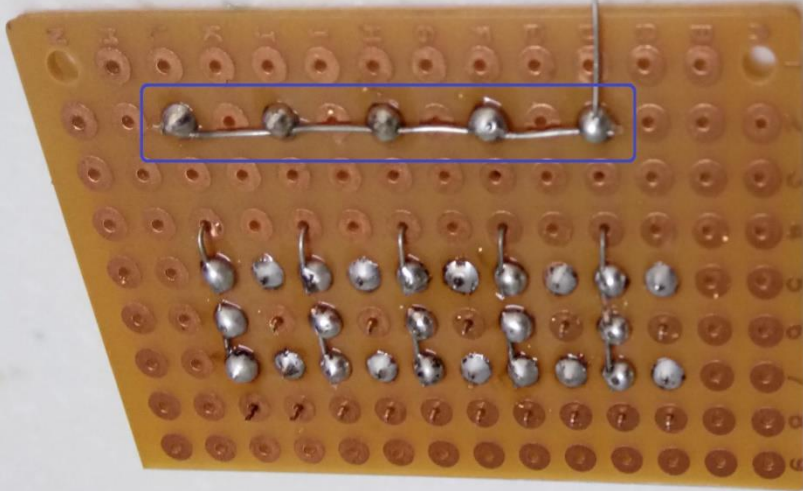
+5V



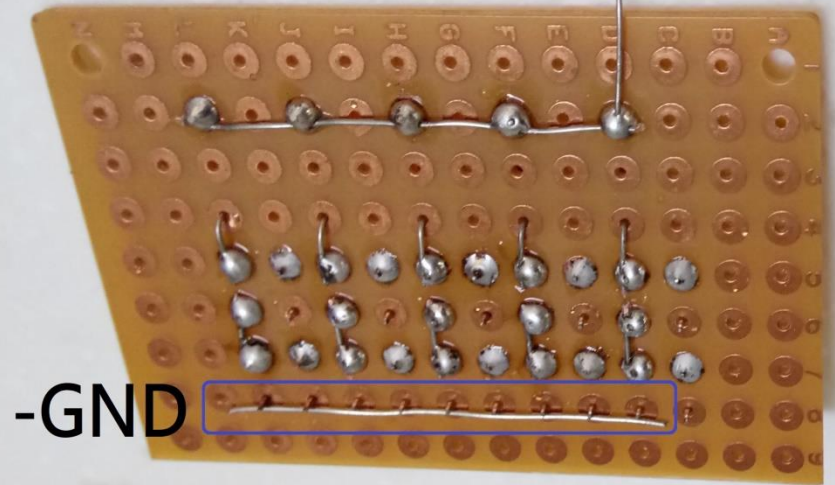
+5V



+5V

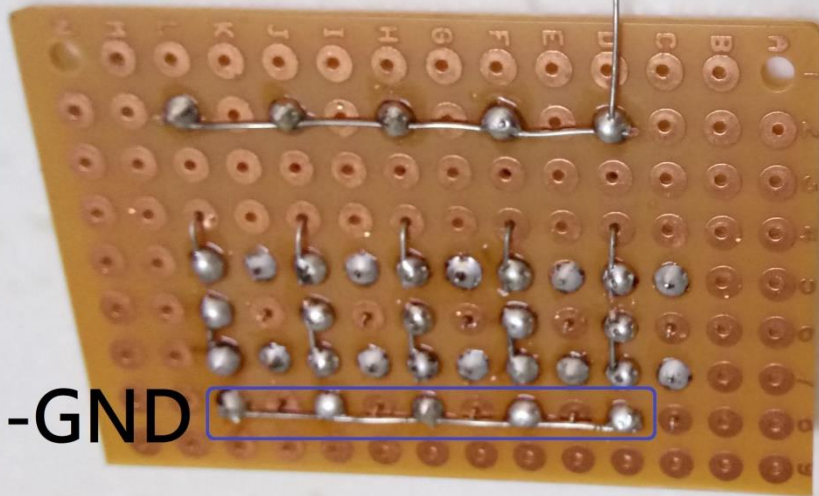


+5V



-GND

+5V



-GND

+5V

-GND

