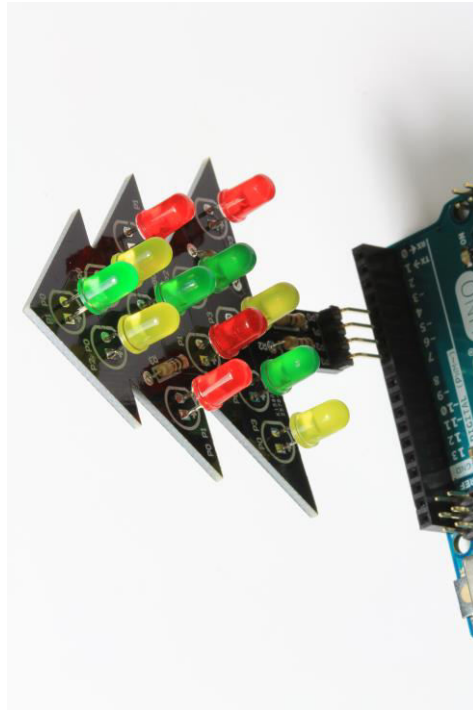


CHARLIEPLEXING CHRISTMAS TREE

(ARDUINO COMPATIBLE)
PRODUCT CODE: M00270045

FEATURE:

- Only 4 pins to control 12 LED.
- Any flashing pattern can be made by writing the Sketch (Arduino program), any brand of Microcontroller or external control circuit.
- Assembly is needed.
- Arduino Sketch example for showing Charlieplexing technique is attached.
- Requires 1 Arduino UNO (not included).



READ BEFORE INSTALLATION:

- Put the component on the side of screen printing and solder on the back of PCB without printing.
- On component, longer leg is "+".
- Do not put the LED to very bottom, just install as Figure 1.
- Do not connect this shield into the Arduino when downloading the Sketch.



DESCRIPTION:

The circuit design is based on the Arduino UNO. Of course, this can be used on any brand of Microcontroller or external circuit if the pin location is matched. If this is not matched, just route this yourself. This uses the Charlieplexing technique to control the 12 pieces of LED. The technique is by changing the unwanted pin into high-impedance state. The advantage of this technique is using lesser pin to control same amount of LED. In this example, this use 4 pins to control 12 pieces of LED. If you want to know more detail, you can find the detail in the web. In the Sketch example, this show you how to light on only one LED and this can show you the core of Charlieplexing technique.

INSTALLATION:

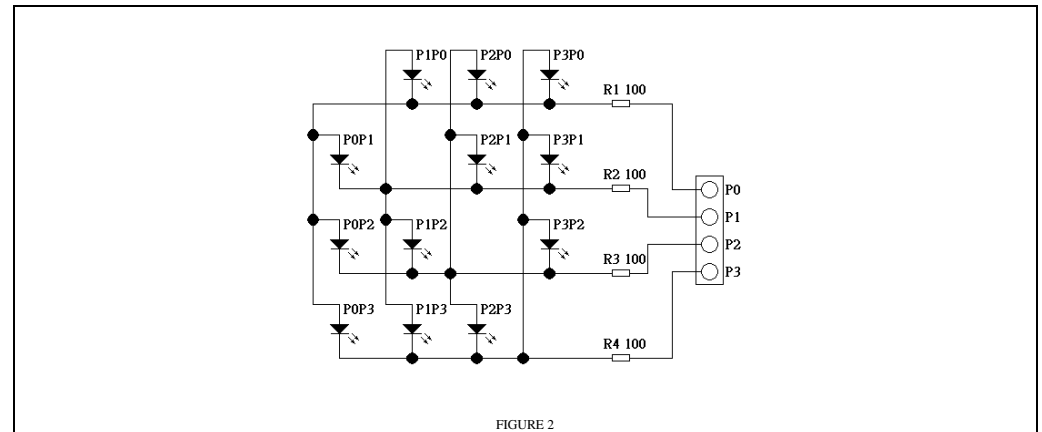
Just install the component to the PCB M00260080 according to below table

ITEM	SYMBOL ON PCB	DESCRIPTION	OUTLOOK	DIRECTION IS IMPORTANT?
1	R1	RESISTOR, 100 ohms	BROWN, BLACK, BROWN	NO
2	R2	RESISTOR, 100 ohms	BROWN, BLACK, BROWN	NO
3	R3	RESISTOR, 100 ohms	BROWN, BLACK, BROWN	NO

4	R4	RESISTOR, 100 ohms	BROWN, BLACK, BROWN	NO
5	P0P1	YELLOW LED	ONE LONG LEG AND ONE SHORT LEG	YES NOTE 1
6	P0P2	GREEN LED		
7	P0P3	GREEN LED		
8	P1P0	GREEN LED	RED LED	
9	P1P2	RED LED		
10	P1P3	YELLOW LED	RED LED	
11	P2P0	GREEN LED	YELLOW LED	
12	P2P1	YELLOW LED		
13	P2P3	RED LED		
14	P3P0	GREEN LED	RED LED	
15	P3P1	GREEN LED	RED LED	
16	P3P2	P3P2		
17	P0 P1 P2 P3	BREAK AWAY MALE HEADERS	4 PINS	NO

NOTE 1. You can install 12 pieces of LED to any 12 positions of Printed Circuit Board. But you should note which pin of LED is positive and negative when soldering.

CIRCUIT DIAGRAM:



SKETCH:

- Some Pin of Arduino board is not allowed to be set as INPUT. But the below Sketch still work because we do not use Pin 0 and 1 as INPUT.

/* The most difficult action of this kits is just turning on one LED.
Now I show you how. */

```
int P0 = 0;
int P1 = 1;
int P2 = 2;
int P3 = 3;

void setup() {
}

void loop() {

  pinMode (P0, OUTPUT);
  pinMode (P1, OUTPUT);
  pinMode (P2, INPUT); // Setting the useless pin to INPUT.
  pinMode (P3, INPUT); // Setting the useless pin to INPUT.
  digitalWrite (P0, HIGH);
  digitalWrite (P1, LOW);
}
```