# FADING IN AND OUT AUTOMATIC STREETLIGHT

PRODUCT CODE: M00270067

## FEATURE:

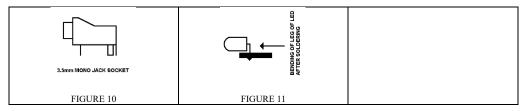
- A light dependent resistor (LDR) is used as sensor for this kit.
- The LED would be on and off in Fading style. This would be similar to the real streetlight.
- There is a leg for the kit so that the kit could stand upright.
- Assembly is needed.



#### READ BEFORE INSTALLATION:

Put the component on the side of screen printing and solder on the back of PCB without printing.

This is +	MARK ON DIODE  DIRECTION OF MARKING ON PCB	LEAVE SOME SPACE BETWEEN LED AND POB
FIGURE 1	FIGURE 2	FIGURE 3
IC MARKING ON PCB  THE FIRST LEG OF IC IS KNOWN FROM THE DIRECTION OF CHARACTER, BLACK SPOT OR  "U" EDGE OF IC.	PCB	HOLE ON PCB SOLDERING
FIGURE 4	FIGURE 5	FIGURE 6
ED LDR BY LOOKING AT THE TOP	ADJUSTMENT POD  VARIABLE RESISTOR	TRANSISTOR BY LOOKING AT THE TOP
FIGURE 7	FIGURE 8	FIGURE 9



### DESCRIPTION:

- Just look at circuit diagram of Figure 12.
- In Part 1, the function of D1 is to prevent reverse power supply.
- Part 2 is the brain of the whole circuit. PR is a Light Dependent Resistor (LDR), the resistance decreases with increasing light intensity. R1 and PR work as potential divider circuit. VR is a variable resistor and these three legs also work as potential divider circuit. The middle leg of VR work as output. U1A work as comparator. Leg 1 of U1A becomes high when the voltage at Leg 3 is higher than Leg 2. Leg 1 of U1A becomes low when the voltage at Leg 3 is lower than Leg 2. By using this logic, this part work as light detecting circuit.
- Part 3 is the fading in and out circuit. When leg 1 of U1A is high, this would charge up the capacitor C1 through R2. Why not charge up the capacitor C1 through R3 because there is a diode D3 restricting this. When Output of U1A is low due to lower light intensity on part 2, the charge on capacitor C1 would discharge through R3, D3 to leg 1 of U1A. The function of R2 and R3 is the reason of fading effect because they would slow down the charging and discharging time of capacitor C1.
- Part 4 is just a voltage follower. You could understand this as isolating the circuit (infinity input resistance at leg 5 and zero output resistance at leg 7) of Part 3 and Part 5. What voltage sense at leg 5 of U1B would appear at leg 7 of U1B.
- Part 5 is only four LED that you can think this is similar to Streetlight. This gives out the result coming from part 2. When Leg
  7 of U1B is high, four LED is on.

### INSTALLATION:

Just install the component to the PCB M00260115 according to below table.

ITEM	SYMBOL ON PCB	DESCRIPTION	OUTLOOK	DIRECTION ON INSTALLATION?
				AND OTHER
1	R1	RESISTOR, 100K ohms	BROWN, BLACK, YELLOW	NO
2	R2	RESISTOR, 1M ohms	BROWN, BLACK, GREEN	NO
3	R3	RESISTOR, 1M ohms	BROWN, BLACK, GREEN	NO
4	R4	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
5	R5	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
6	R6	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
7	R7	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
8	R8	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
9	Q1	TRANSISTOR, NPN	FIGURE 9	YES
10	D1	DIODE, IN4001	FIGURE 2 (MOSTLY BLACK)	YES, FIGURE 2
11	D2	DIODE, IN4148	FIGURE 2 (MOSTLY TRANSPARAENT RED)	YES, FIGURE 2
12	D3	DIODE, IN4148	FIGURE 2 (MOSTLY TRANSPARAENT RED)	YES, FIGURE 2
13	PR	LDR	FIGURE 7	NO
14	VR	VARIABLE RESISTOR, 1M ohms	FIGURE 8	NO
15	U1	DIP 8 SOCKET	8 LEGS	NO
16	C1	CAPACITOR, 10uF	MARK WITH 10uF OR SAME MEANING OF VALUE	YES, NOTE 1
17	SWITCH	SLIDE SWITCH	SIX LEGS	YES, FIGURE 5
18	DCJACK	3.5mm MONO JACK SOCKET	FIGURE 10	YES
19	B+, B-	9V BATTERY ADAPTOR	RED WIRE, BLACK WIRE	YES, NOTE 2
20	L1	LED	ONE LONG LEG AND ONE SHORT LEG	YES, FIGURE 1, FIGURE 3, NOTE 1, NOTE 3
21	L2	LED	ONE LONG LEG AND ONE SHORT LEG	YES, FIGURE 1, FIGURE 3, NOTE 1, NOTE 3
22	L3	LED	ONE LONG LEG AND ONE SHORT LEG	YES, FIGURE 1, FIGURE 3, NOTE 1, NOTE 3
23	L4	LED	ONE LONG LEG AND ONE SHORT LEG	YES, FIGURE 1, FIGURE 3, NOTE 1, NOTE 3
24	ON THE TOP OF ITEM 15	IC, LM358	8 LEGS	FIGURE 4
25	/	LEG	PCB IN OUTLOOK	NOTE 4

- NOTE 1: On component, longer leg is "+".
- NOTE 2: Red is B+ and Black is B-. Also, please tie a knot after the red and black wire has passed the neighbors hole before soldering. This is similar to Figure 6.

- NOTE 3: Do not put the LED to very bottom, just install as Figure 3. Then bend the leg as Figure 11 so that the LED light is similar to real streetlight when light is on.
- NOTE 4: You could solder the both PCB together. There are soldering pats on the bottom on both PCB.

## HOW TO PLAY?

- 1. Connect a 9V battery or plug a 3.5mm mono jack (9V with middle is "+") into the DCJACK.
- 2. By turning the kits into working status. Firstly, you close the lamp of the room. Then rotate the VR slower until the 4 LED light on. When you turn on the lamp of the room, the 4 LED should light off again. Because the LED would light on in Fading in style, so the LED would not light on at once even you have turned the VR in right setting.

## CIRCUIT DIAGRAM:

