

# Nest Box IR Illuminator

## Description

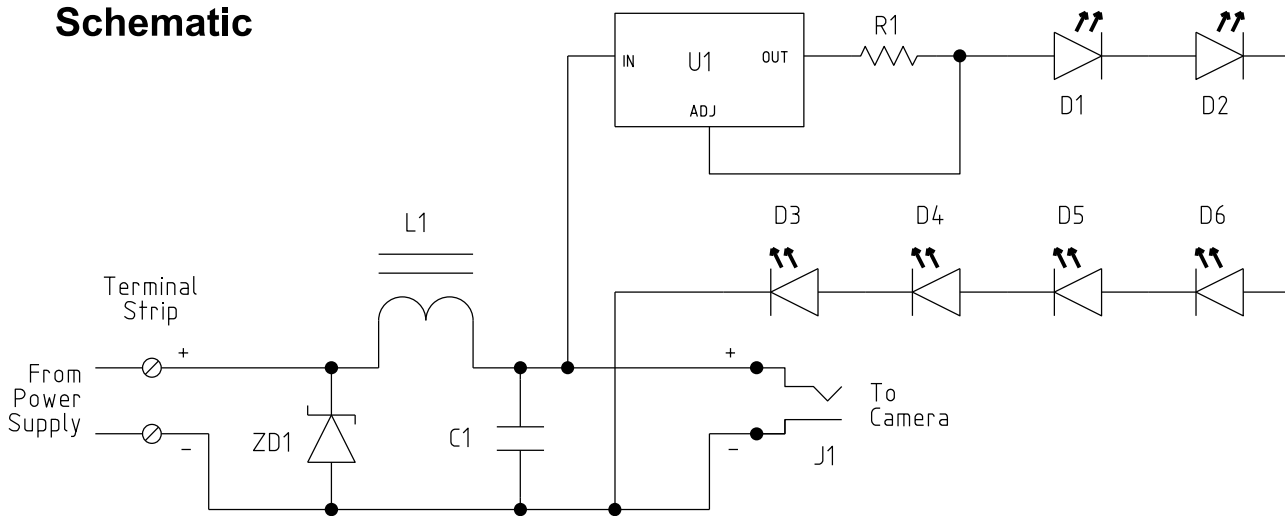
This circuit is for a low-powered infra-red illuminator for use in small wildlife nesting boxes. It is intended to be installed in series with the power connector to the camera and as a bonus provides some extra power supply filtering/protection to the camera. ZD1 and L1 are included pretty much entirely for the benefit of the camera and could be omitted if required, however analogue cameras can be vulnerable to electrical noise and these components provide some cheap insurance.

If your camera doesn't use a 2.1 mm male power connector, you will have to modify this part of the circuit to suit. Double-check the camera power supply polarity; the central pin is \*usually\* positive, but check it anyway. No responsibility is taken for damaged cameras if you wire it backwards!

This circuit is designed for a 12 V DC supply but will probably work down as low as 10 V depending on the IR LEDs used. To run at a lower voltage, remove one or more of the LEDs. To run at a higher voltage, you will need to replace ZD1 with one which has a higher breakdown voltage. Also, with a higher voltage it would be more efficient to add extra LEDs to the string and run them at a lower current. Power consumption depends on the power supply voltage and what current you choose to run the LEDs at, but is nominally around 0.12 W.

For best results, locate the LEDs in a circle around the camera lens.

## Schematic

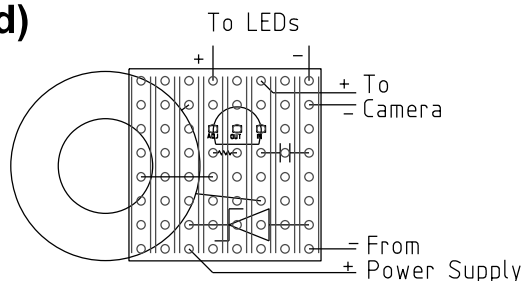


## Parts List

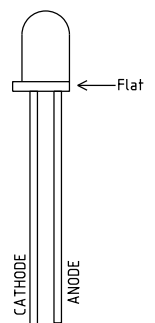
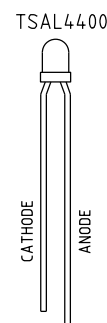
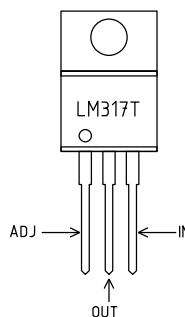
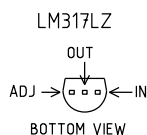
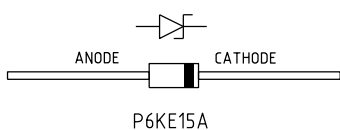
- C1 = 0.1 µF 50V ceramic
- D1-6 = 940 or 950 nm IR LED with a lens angle of 30°+ (e.g. TSAL4400, SFH 4502, Jaycar ZD1945 etc.)  
Do not use 850 nm IR LEDs as these emit a dull red glow. If in doubt, test the LED first.
- J1 = Female 2.1 mm DC Power Connector (to suit camera)
- L1 = 1 mH (30 t of 0.5 mm dia wire around an 18 mm ferrite torroid)
- R1 = 120Ω\* 5% 1/8 W
- U1 = LM317 (LM317LZ is recommended because it's smaller and cheaper)
- ZD1 = P6KE16A 15 V TVS (could also use P4KE16A, 1.5KE16A etc.)

\* = LED current is set by resistor R1 according to the formula  $I = 1.25/R1$  (i.e. 120Ω gives approximately 10 mA)  
You may need to adjust this according to the type of LED in use

## Possible Layout (Veroboard)



## Component Pinouts



SFH 4502  
(Note: Connections are opposite to a normal LED.)