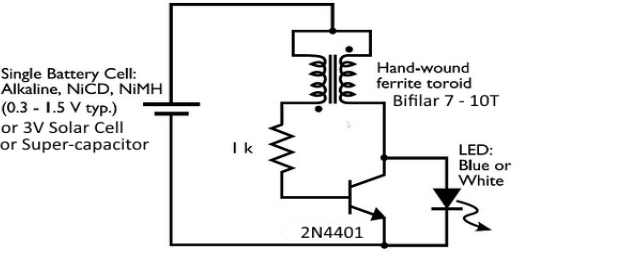


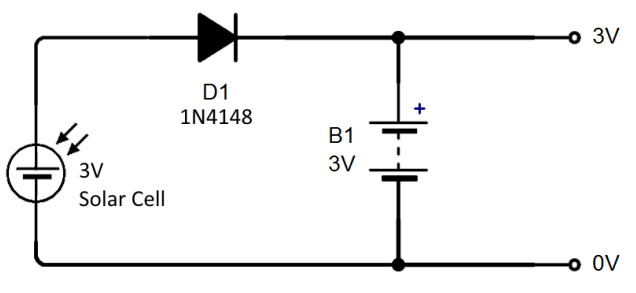
Joule Thief Lighting

Basic Light/Torch:

	R1	1K [Brown, Black, Red, Gold]
	Q1	2N4401 NPN Transistor
	X1	Bifilar coil 7 – 10T [see instructions]
	D1	10mm Ultra bright white LED
	H1	2 pin SIL header
	SW1	PTM switch
	B1	AA battery holder – add last

In this case use a standard AA 1.5V non rechargeable battery.

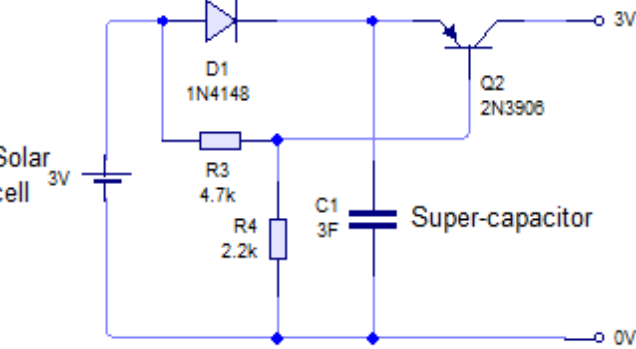
Basic Solar Light/Torch:

	R1	1K [Brown, Black, Red, Gold]
	D1	1N4148 Diode
	X1	Bifilar coil 7 – 10T [see instructions]
	D2	10mm Ultra bright white LED
	H1	2 pin SIL header
	SW1	PTM switch
	SC1	3V Solar Cell
	B1	AA battery holder – add last
C1	6F Supercapacitor in lieu of AA battery & holder	

This circuit is the power supply for the above circuit, the 3V can be a rechargeable AA or Supercapacitor.

In this case use a standard AA 1.5V rechargeable battery, this can be swapped out in favour of a 2.7V 6F supercapacitor if required, but has a limited running time.

Auto switching Solar light:

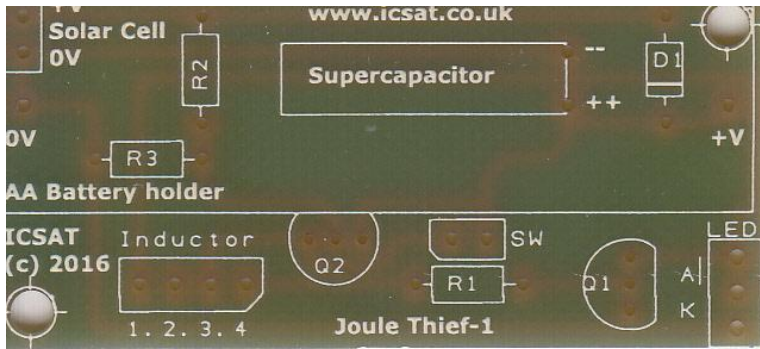
	R1	1K [Brown, Black, Red, Gold]
	R2	4K7 [Yellow, Violet, Red, Gold]
	R3	2K2 [Red, Red, Red, Gold]
	D1	1N4148 Diode
	X1	Bifilar coil 7 – 10T [see instructions]
	D2	10mm Ultra bright white LED
	H1	2 pin SIL header
	SW1	PTM switch
	SC1	4V Solar Cell
	B1	AA battery holder – add last
C1	6F Supercapacitor in lieu of AA battery & holder	

This circuit is the power supply for the first circuit, the 3V can be a rechargeable AA or Supercapacitor.

In this case use a standard AA 1.5V rechargeable battery, this can be swapped out in favour of a 2.7V 6F supercapacitor if required, but has a limited running time.

The ICSAT Joule Thief PCB can be used to make all variants of the circuit shown above.

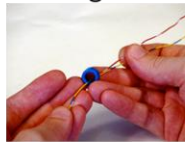
Joule Thief PCB:



Winding the bifilar coil:

- The first task is to wind our own inductor, to do this we need a small ferrite core and two 200mm length of solid insulated wire – Cat5 network cable is the best to use.

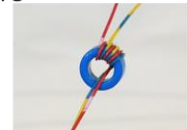
1. Take the two strands of wire through the centre of the core



2. Keeping the two strands together, wrap them around and through the core again



3. Keeping the two wires together, make a few more turns through the centre



4. Keep winding until you fit as many turns as will fit in a single layer around the core, typically 8-10 turns with thin insulated wire



5. Clip the wire leads down. Note that we have two pairs of wires: one coming out the front, and one coming out the back, and strip off the insulation

