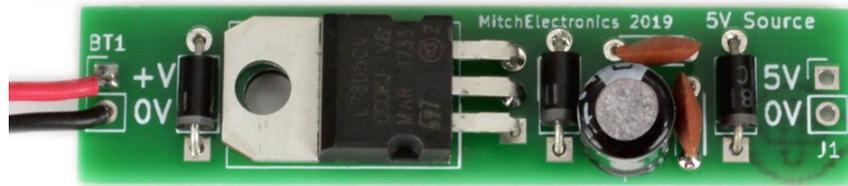


# 5V Source Kit

MitchElectronics 2019

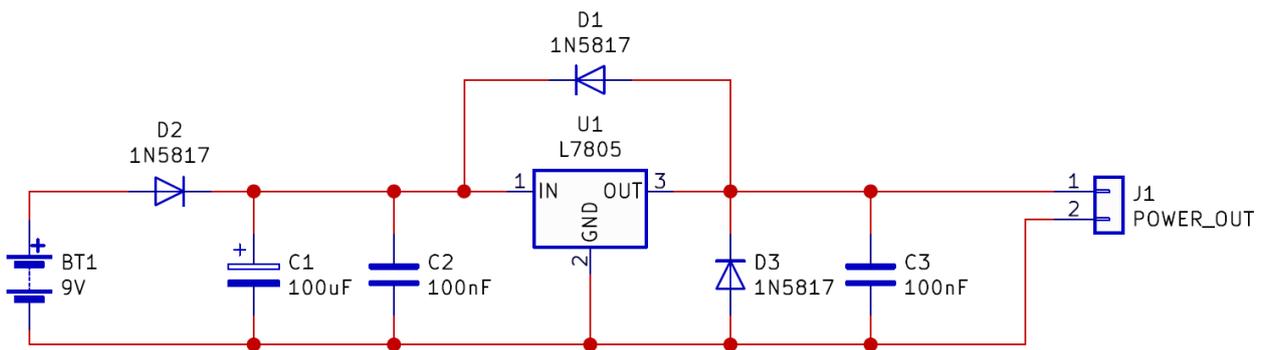


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# SCHEMATIC



## SCHEMATIC EXPLANATION

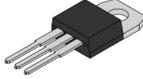
Many circuits (including some MitchElectronics kits), require a 5V supply that is smoothed and reliable. The reason for this is that some components are not able to handle other voltages such as the buzzer found in many MitchElectronics kits which are rated for 5V operation only. If a different voltage is used then the component may either fail to work or even break!

Creating a 5V source can be done with the use of the 7805 regulator but bread boarding a 5V source is cumbersome as breadboards are often large in size and inconvenient. This 5V source kit, however provides you with a 5V source that is compact, small, and convenient which takes a standard 9V PP3 battery and produces a stable and regulated 5V for all your 5V needs!

The first stage in this circuit is D2 which is a rectifying diode that protects the circuit from reverse voltages (i.e. inserting the battery the wrong way round). The second stage are two decoupling capacitors; C1 and C2. C1 is designed to prevent voltage changes from large current consuming devices such as motors while C2 prevents switching noise from the battery side injecting itself into the circuit that is drawing the 5V (remember, you can power this with a range of sources including a bench PSU which may have switching noise). The third stage is the regulation itself which is done with the 7805 5V linear regulator that regulates voltages above 7V to 5V (it is a good idea to keep the input voltage less than 10V to this circuit to avoid heating of the 7805 and unnecessary power wastage). The diodes D1 and D3 are protection diodes that prevent the 7805 from being damaged by sudden voltage spikes from the connected circuit. The last stage is a decoupling capacitor C3 which helps to remove switching noise on the 5V that may be injected by the connected circuit (for example, a connected Arduino).

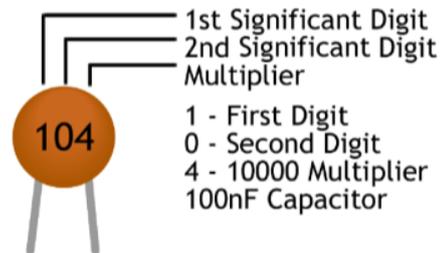
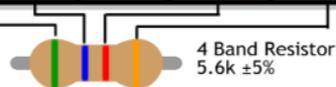
# CONSTRUCTION

Check that you have the following components

Component	Component Name	Quantity	Looks like
7805	U1	1	
100nF Capacitor	C2, C3	2	
100uF Capacitor	C1	1	
1N5817 Diode	D1, D2, D3	3	
PP3 Connector	BT1	1	
Red Wire	J1	1	
Black Wire	J1	1	
PCB	-	1	

## RESISTOR AND CAPACITOR IDENTIFICATION

Colour	1 <sup>ST</sup> Band	2 <sup>ND</sup> Band	3 <sup>RD</sup> Band	Multiplier	Tolerance
BLACK	0	0	0	1Ω	
BROWN	1	1	1	10Ω	±1%
RED	2	2	2	100Ω	±2%
ORANGE	3	3	3	1kΩ	
YELLOW	4	4	4	10kΩ	
GREEN	5	5	5	100kΩ	±0.50%
BLUE	6	6	6	1MΩ	±0.25%
VIOLET	7	7	7	10MΩ	±0.10%
GREY	8	8	8		±0.05%
WHITE	9	9	9		
GOLD					±5%
SILVER					±10%



# CONSTRUCTION

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## Download the electronics construction manual

To learn how to construct circuits on PCBs download the Electronics Construction Manual from MitchElectronics using the link below. This document shows you how to install all electronic components used in MitchElectronics kits. The list below shows the sections relevant to this kit so do not worry if you see component sections in the document that don't come with this kit!

[www.mitchelectronics.co.uk/electronicsConstructionManual.pdf](http://www.mitchelectronics.co.uk/electronicsConstructionManual.pdf)

## Relevant sections in the electronics construction manual

Capacitors

Regulators

Diodes

Wires

# IMPORTANT INFORMATION

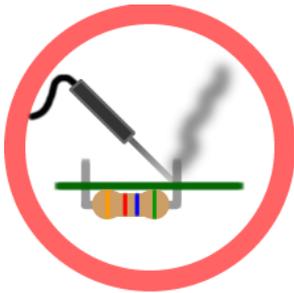
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*RoHS Compliant Kit (Lead free)*



*Low Voltage Kit*



*Caution! Soldering Required*