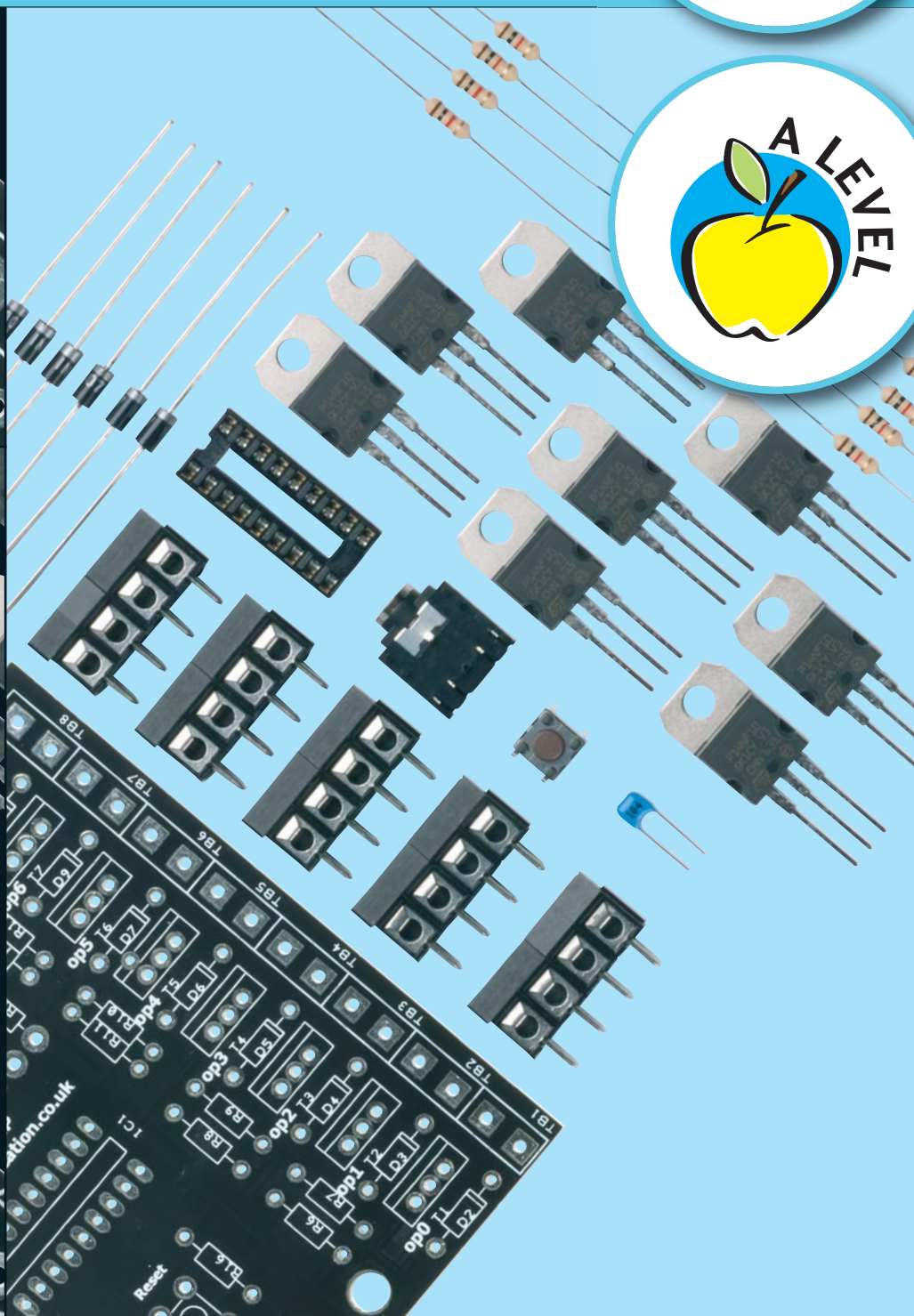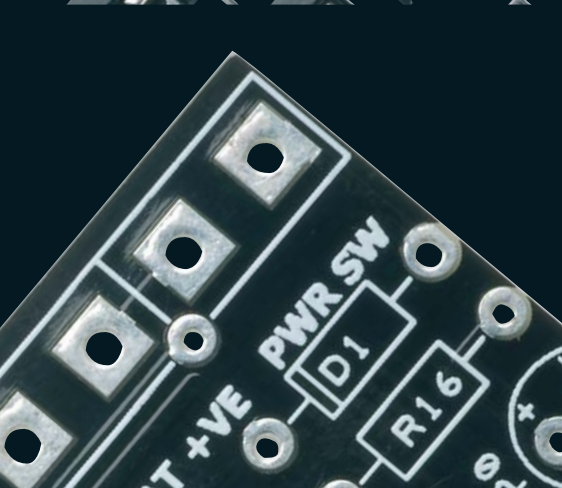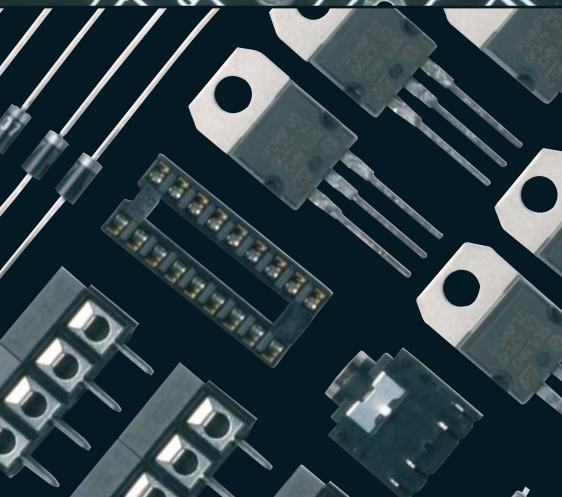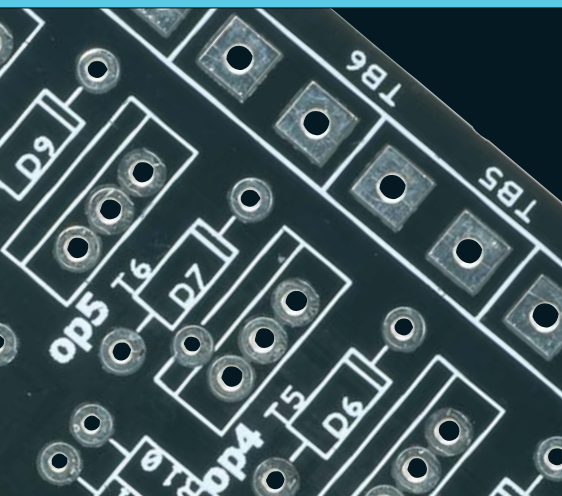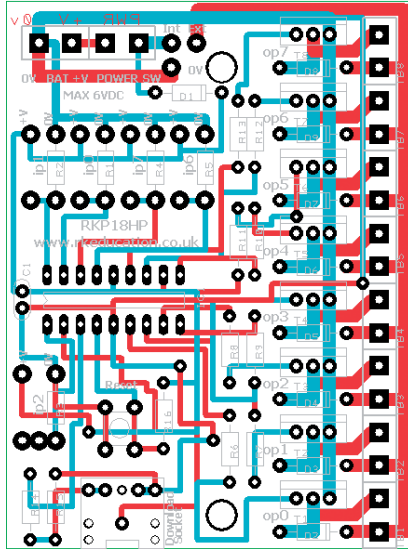# RKP18HP High power project board

Component list and instructions for:
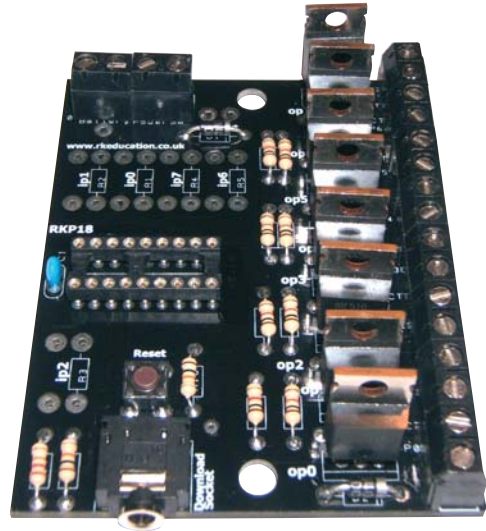
RKP18HP High power project board   70-6001

Rapid

RKP18HP Component list and instructions

PCB layout

Constructed PCB

Description

The RKP18hp project PCB has been designed to use PIC microcontrollers such as the kicchip from **www.kicchip.co.uk**

· The software is downloaded from a PC into the microcontroller via a 3.5mm stereo socket
· The clock reference is from the microcontrollers internal resonator
· 8 outputs are connected to high power TO220 outputs e.g. TIP112
· Power to the TO220s can either be from the main power supply or from an external source
· 5 potential divider inputs, 3 can be used as analogue
· 1 input can have a PCB mount potentiometer directly mounted

Component list

BAT & POWER SW – 2-way 5mm pitch terminal blocks
TB1 ~ TB8 – 3-way 5mm terminal block
C1 – 100nF multilayer ceramic capacitor
D1 ~ D9 – 1N4007
IC1 – 18-way DIP socket with microcontroller e.g. kicchip
R6 ~ R13 – 1k brown black red
R14 – 22k red red orange
R15 & R16 – 10k brown black orange
RESET – PCB mounting tactile switch
Software download socket – PCB mount 3.5mm stereo connector
T1 ~ T8 – TO220 transistor or FET e.g. TIP112 IRF510

Instructions

For instructions on using your chosen microcontroller, e.g. kicchip, please see the appropriate website – **www.kicchip.co.uk**

Connecting power

The power is connected to the terminal block marked BAT, the 0V input, usually black is put in the left hand terminal and the +V, usually red, is connected to the right hand terminal, a regulated 6V DC power supply should be used.

A power switch can be used and this should be inserted into the terminal block marked POWER SW, if a power switch is not required short the terminals together

Power to the TO220 outputs can either be internal or external, if you want to use the internal supply, that is the +6V DC on the BAT terminal block, then short the pads marked Int and Ext together.

If you want to use an external power supply connect the 0V DC to the 0V pad and the +V DC to the Ext pad, alternatively the 0V DC from the external power supply could be inserted into the 0V of the BAT terminal block.

· www.rapidonline.com · tel: 01206 751166

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Using the high power TO220 outputs

The TO220s can be turned on by sending a +VE output from the microcontroller, by sending a logic 1 from the software to the appropriate output pin.

Each of the FET outputs has a back EMF protection diode and as such a DC motor can easily be added, simply insert the cables from the motor into the appropriate terminal blocks, please note a capacitor will need to be used on the motor terminals.

They are connected to the microcontroller as follows,
T1 – pin-6 – output 0
T2 – pin-7 – output 1
T3 – pin-8 – output 2
T4 – pin-9 – output 3
T5 – pin-10 – output 4
T6 – pin-11 – output 5
T7 – pin-12 – output 6
T8 – pin-13 – output 7

To use an output simply attach flying leads to the appropriate output terminal block.

Inputs Ip0 ~ Ip7

These are used as digital inputs and Ip0, Ip1 and Ip2 can also be used as analogue inputs. They are arranged as potential dividers with the +V and 0V parts clearly marked, the centre of the potential divider or output are the 2 pads to the right hand side of the potential divider. Ip2 has been designed to allow a PCB mounting potentiometer to be soldered directly to the PCB.

They are connected to the microcontroller as follows,
Ip0 – pin-17
Ip1 – pin-18
Ip2 – pin-1
Ip6 – pin-15
Ip7 – pin-16

Please see below for an example of using inputs
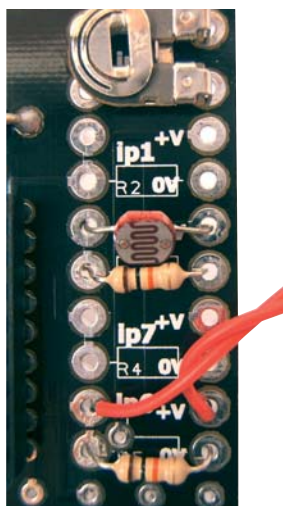
Here the input section can be seen close up. It can be seen from Ip1 that the inputs are set up as potential dividers and the +V and 0V are clearly labelled.

For the preset resistor 1k has been used, it is not recommended to use a high value as it will affect the a2d conversion. The analogue value from the preset can be read using the appropriate function in your software. Ip2 has been used.

The LDR and resistor can be used to detect when it is light or dark. This can be done with an a2d conversion but as the LDR has a very wide resistance range it can also be read like a digital switch. Ip0 has been used.

The PTM switch and 10k pull down resistor would be read as a digital signal, either on or off. The state of the switch would be read in software as high or 1 for pressed and low or 0 for not pressed. It is important to use a pull up or pull down resistor and if the switch and resistor were reversed then a press would give a 0 or low signal.

If you have any comments or queries please email us at

tech@rapidelec.co.uk