



Parts list

Q1 and Q2 Mosfets : MOSFET N-CH 24V 195A TO-220
Digikey part: IRF1324PBF-ND

*you can use just about any mosfet you like here from 12V to 250V , HHo cells tend to have voltage spikes so choose one rated higher then your operating voltage.

R1, R3, R4, R8: 100K ¼ W Digikey part: 100KQBK-ND

R2: 47K ¼ W Digikey part: 47KQBK-ND

R7: 10K ¼ W Digikey part: 10KQTR-ND

R5: R9: 4.7K ¼ W Digikey part: 4.7KQTR-ND

R6: 470K ¼ W Digikey part: 470QTR-ND

VR1: POT 10K ¼ W Digikey part: 3310C-001-103L-ND

**** YOU CAN USE ANY POT HERE FROM 10-50k , THIS ADJUSTS THE DUTY CYCLE.

U1: OP AMP IC QUAD 14 PIN Digikey part: LM324ANNS-ND

D1: RECTIFIER 100V 6A Digikey part: FR602DICT-ND

D2: ZENER VREG 12V 5% Digikey part: 568-1363-1-ND

C1: CAP0.011UF 630V Digikey part: P12112-ND

C2: CAP47UF 35V RAD Digikey part: P5550-ND

C3: CAP0.10UF 250V Digikey part: 495-1197-ND

Heat sinks (2) Digikey part: 345-1032-ND

Feel free to use any heat sinks you like... we have overdone is with these , they are a bit expensive.

D1 and C3 are protection components and do not have to be populated to function. These are optional.

C1 and R1 make up the rc time constant that determines your pwm's frequency. You can use an Rc time constant calculator to play around with different capacitor and resistor values to get different frequencies. You can also replace R1 with a variable resistor or pot to have adjustable frequency. [Here is a link to a good RC time constant calculator.](#)

On the back of the board are the inputs and outputs. ...

0V is the negative input from your power source 12-250v , you can solder directly to the board or use a connector.

-M is the pulse width modulated output.

+M is not used

+ V in is your 12V input for the logic portion of the board.

*** if you are pulse width modulating any voltage higher than 12V then a 12V- line must also be soldered to the underside of 0V so they share common ground.

If you are going to use a cooling fan for running high amps , solder the connections to the underside of C2 so that it can absorb any transients and the inductive load from when the circuit is shut off and the fan continues to spin for a bit.. if the voltage is not absorbed it will destroy your op amp..

If you have any questions please feel free to email us.. we love to help.. this is our passion! And if you figure out any magical fracturing of water with using frequencies produced by our PWM .. we claim all rights to the technology! Lol ...

Have fun!

We also been toying with the idea of offering a components set for this PWM on our website, so you don't have to go shopping around.. if this would interest you let us know and well see what we can do for pricing.. We order components in large volumes and use very high quality parts..

Thank You, Jeremy March ~ March Labs and Hybrid Conversions