Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

DC Motor Speed Control
Model GSK-804

This circuit allows the user to vary the speed of a DC motor from a stop position to maximum revolutions per motor specification.

Technical Specifications
- Power source: 12 VDC
- Load voltage: 12 VDC, 1.5 A max.
- Output: controlled DC motor by pulse width modulation
- PCB dimensions: 1.76 x 1.32 inches

Operating Principles
Integrated circuit oscillates the frequency at 264 Hz relative to resistors 1, 2, and 3, variable resistor 1 and capacitor 1. VR1 provides adjustment of duty. If the plus duty is more than the minus duty the motor will slow down. Frequency will be transmitted through IC to resistor 4 and the base of transistor 1 making TR1 function as adjustment of VR1.

$$\text{Frequency} = \frac{1}{T1+T2}$$

$T1$ = 0.693 (R1+R2) C1
= 0.693 (10K+5K) x 0.01
= 103.95 Hz

$T2$ = 0.693 (VR1+R3) C1
= 0.693 (500K+30K) x 0.01
= 3,762.90 Hz

Frequency = 264.7709 Hz

PCB Assembly
Please refer to Figures 1, 2, and 3 for aid in component placement. It is recommended to start with lower components i.e. diodes, resisters, electrolyte capacitors, and transistors. Be careful to check polarity with Figure 3 before soldering. Take extra precaution to ensure electrolytic capacitors are inserted correctly. If a problem is detected it is best too use a desoldering pump or desoldering braids to remove component. This will minimize potential damage to the printed circuit board.

Figure 1 Installing components
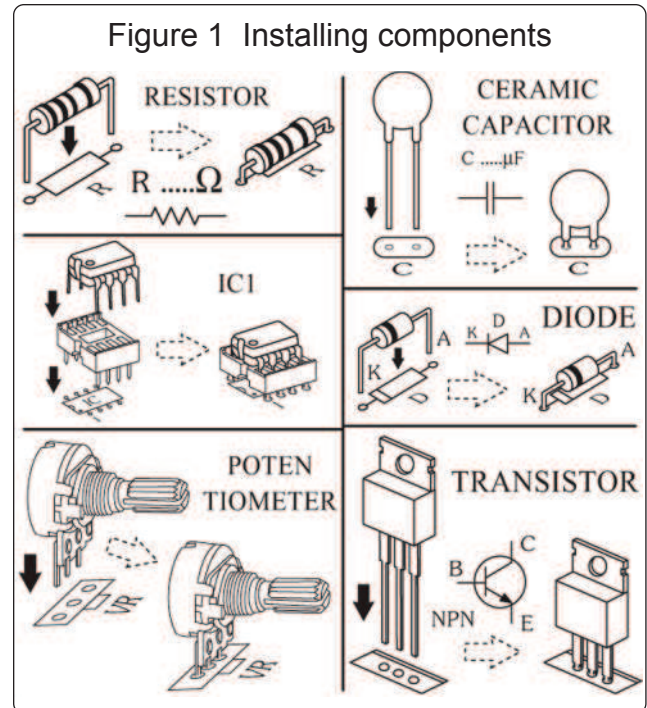
Testing
Connect 12 VDC motor to the "OUT" terminals of PCB. Connect power source and adjust speed by turning potentiometer counterclockwise to slow motor and clockwise to speed motor up. If load voltage is sustained above 800 mA circuit should be ventilated. Maximum load is 1.5 A.

Troubleshooting
The main cause of problems will come from misplaced components or faulty soldering. Utilize Figures 1, 2 and 3 to ensure proper placement, polarity and then check solder points for connectivity.
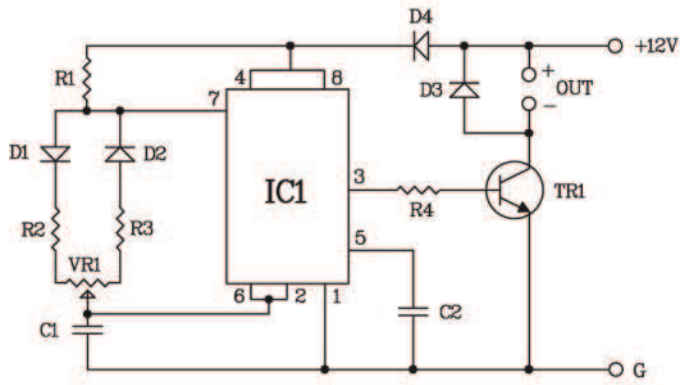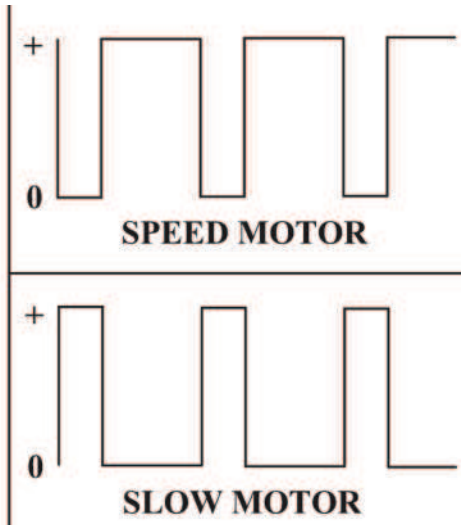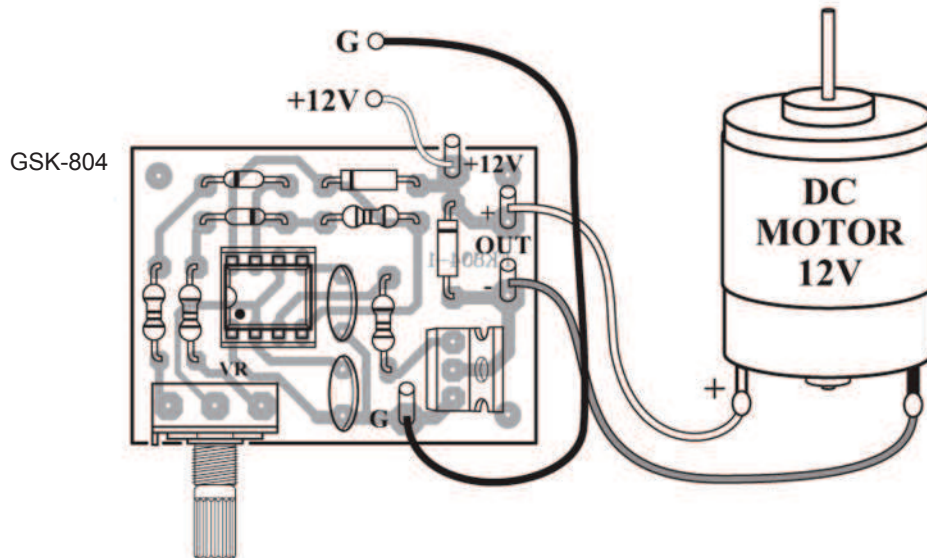
Figure 2 DC motor speed control circuit

Figure 3 Connecting Circuits

GSK-804

Resistors			
R1	10 kΩ	brown – black – orange – gold
R2	5 kΩ	green – black – red – gold
R3	30 kΩ	orange – black – orange – gold
R4	300 kΩ	orange - black - brown – gold

Potentiometer
VR1   504 or 500 kΩ

Ceramic Capacitors
C1, C2   103 or 0.01µf

Transistor
TR1   C1061 or D1933

Diodes
D1, D2   1N4148
D3, D4   1N4001

Integrated Circuit
IC1   555