



Instruction Manual

GSK-60 3-Pin Regulated Power Supply

Many times there exists a need to use a standard three terminal voltage regulator for a project, but there is no way to mount it. Usually components end up being soldered in a spaghetti-wired mess. This problem is overcome by using the GSK-60 Power Supply Kit. The GSK-60 is a universal PCB that will accept any positive 78xx, 3 pin voltage regulator in a TO-220 package. Voltage regulators are specified by the last two digits in their nomenclature. The full range of fixed voltage, 3-terminal regulators is: 7805, 7806, 7808, 7809, 7812, 7815, 7818, 7820 & 7824.

The user supplies the 3 pin voltage regulator that they want to use, and the kit contains all of the other components needed for most common applications which you will face. You may plug in an unregulated AC or DC input either from a plug or into a terminal block. A minimum input DC voltage of at least 2 to 3 volts greater than the regulated output voltage is required for proper operation. Also, there is a maximum input voltage usually specified (for example, up to 35V for a 7805 to 7818 but this may result in thermal shutdown!)

A 1mF/35V electrolytic capacitor for C1 at the input to the regulator is sufficient for most applications. Its function is to store energy to keep input voltage ripple to a minimum between rectified pulses from the rectifier. Space has been provided for higher value capacitor if you need it, for example, if you use the 3A rated 78Txx series of regulators you may want to use a 2.2mF electrolytic. Note that a bigger heat sink may also be required if you use these higher rated regulators. The monoblock capacitor C2 across the output improves transient response and keeps the impedance low at high frequencies.

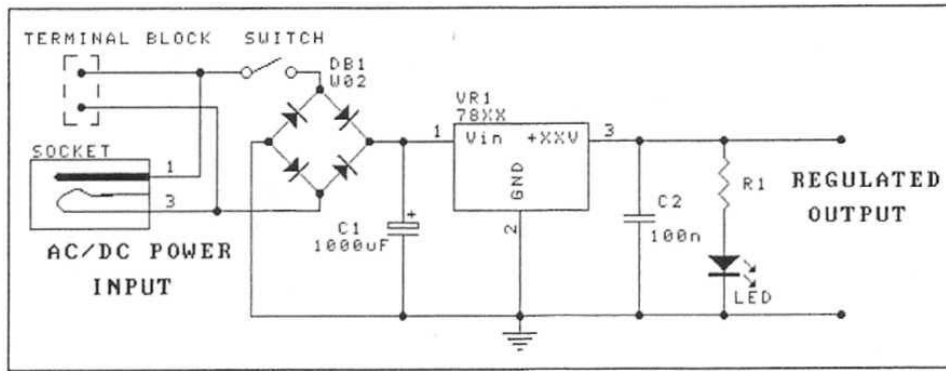
An OFF/ON switch has been provided as well as an LED to indicate when the output regulated power is on-line. Using the LED is optional, and not required for proper circuit operation. The value of the current limiting resistor will change for different outputs. We have provided a 330R resistor for a 5V application. Use a 1K5 for 9V; 2K for 12V and 2K7 for 15V.

Construction. The most important point to remember is to bend the leads of the 3 terminal regulator with needle-nosed pliers. Do not just put it in the PCB & push it over 90°; that may break the IC inside the package. Put the heat sink under it before you solder it to the board. Calculate the correct value of R1 if you are going to use the LED. Make sure that the bridge rectifier and C1 are in the correct way.

Background. For most non-critical applications, the best and simplest choice for a voltage regulator is the 3-terminal type. The 3 terminals are input, ground and output. The 7800 series can provide up to 1A load current and it has on-chip circuitry to prevent damage in the event of overheating or excessive current. That is, the chip simply shuts down rather than blowing out. These regulators are inexpensive, easy to use, and they make it practical to design a system with many PCBs in which an unregulated supply is brought in and regulation is done locally on each circuit board.

There is also a 79xx series of negative regulators. And we could have designed this PCB to accommodate them. However, there is so little call for regulated negative supplies these days that we decided to just design the board for the positive regulators. (Also note that the pin-out for the 79 series is different to that for the 78.)

There are over 20 types of positive 3 terminal regulators available. The 78L00 series (100 mA maximum current in a transistor-type TO-92 package) and the 7800 series (1A current in TO-220AB package) are the most common for the hobbyist. The LM340T-xx series has slightly superior performance to the 78 series & can directly replace it.



COMPONENTS

330R 5% 1/4W resistor orange orange brown	1
100nF mono 0.1"	1
1mF/35V ecap	1
Power jack	1
Heat sink HS-110	1
Nut & screw	1 set
5mm LED	1
Bridge Rectifier WO2M	1
Two pole terminal block	2
SPDT PCB-mounted switch	1
Kit 60 PCB	1