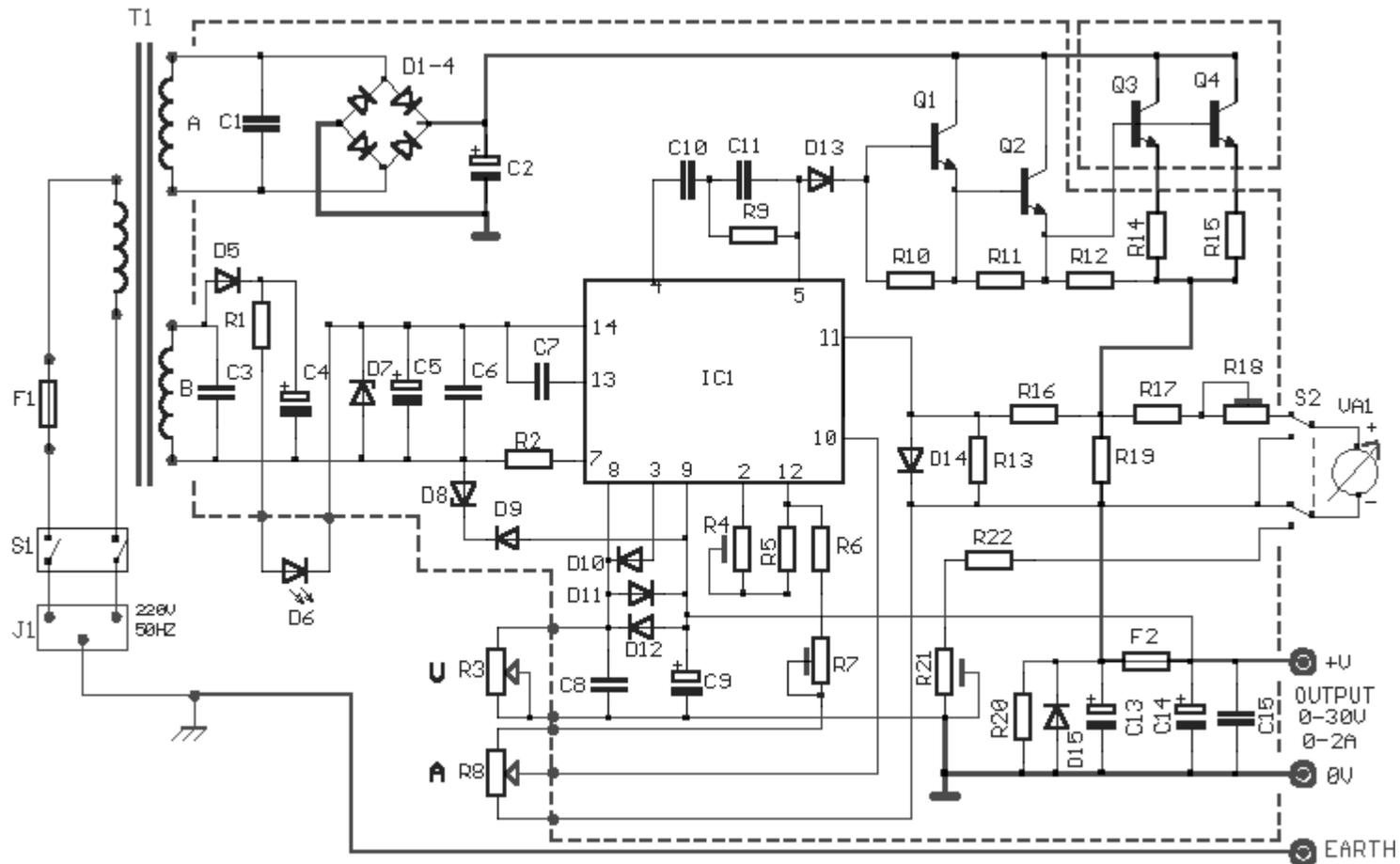


Power Supply 0-30V / 0-2A



Power Supply 0-30V 0-2A

by Sam 10/01

The basic requirements than one laboratorial power supply, it is to provide voltages and currents of operation that need the usual units, to have low output resistance, low noise, small ripple and good stabilisation. The above requirements are covered, from the circuit. Many power supply allocate electronic safety that him protects from destruction, when short their exit. In the circuit it can be regulated the superior price of output current, in a any price from 0 until 2A and him exceed, even if the load need has bigger requirements. Thus not only auto protection, but simultaneously it can it protects also the unit that it supplies, if the last one has the tendency to pull current bigger than forecasted. The circuit, it can be used still for the control of elements, the mapping out of characteristics of voltage /current and be used as a ideal source of constant voltage - current, capable it gives 0-30V dc and 0-2A, continuously regulated and no in steps. The transformer T1 has two secondary coils. The A coil supplies the circuit of output with high current, via the D1-4, C2 and the B coil, that it supplies the IC1, after is rectified by the D1, C4 and is stabilised by the D7, C5. The current passes through LED D6, who is also useful as clue of operation. The C7 makes compensation of frequency in the internal circuit of IC1 and the R2/D8/D9, him protects from the peaks voltage of network. With R3, we regulate the output voltage, in the point that we want. With the R8, we regulate the limit of current, that we wish in the exit. In the exit of power supply exists one multiple Darlington, constituted from the Q1, Q2 and Q3, Q4 that is parallel. The Resistances R14, R15 ensure the homology of currents of collector, the R10 until R12 improve the DC stability of output circuit, that has basic importance in high temperature, where the reverse currents begin to become considerable. The R9, c10, c11 achieves the compensation of frequency in the output amplifier of IC1 and the D13, his protection. Through the R19 it passes the output current. The fall of voltage that is presented in utmost his is degraded at a percentage and it is applied in the entry of 11 IC1. In the second entry of 10 IC1 is applied a constant voltage, the price of which is regulated by the R8, in the desirable biggest price of output current. As soon as the output current exceed this price, the fall of voltage in the R19, it is applied in the entry of 10 IC1, so that is activated the differential amplifier in the IC1 and it prohibits the further increase of output current. Capacitors C13, C14, C15 make unyoke of exit, while the D15 him protects from the reverse voltage. With instrument VA1, we can measure so much the output voltage, what the current, depending on the place that is placed switch S2. In the place that is appears in the circuit, the switch measure the current, taking sample from the fall of voltage, above in the R19, via the R17, R18. To we measure the voltage it will be supposed we move the switch in the other place, taking sample of output voltage. The micrometer regulation becomes from the R21, R22. The Transistor Q2, should be placed in a small heatsink, as well as the Q3, Q4, in heatsink with thermic resistance 2.6° C/W. The regulation of power supply can become easily, with the help of digital multimeter, which we will connect in the exit. Moving and regulating him trimmer in combination with main pontesometer regulation of voltage and current.

Part List

R1= 1.2Kohm 1W

R20= 3.9Kohm

D6= LED 5mm RED

R2-12= 100ohm

R22= 56Kohm

D7= **1N5252B**

R3= 47Kohm Lin.	C1-3 = 330nF 250V	D8= IN5236B
R4-7-21= 10Kohm trimmer	C2= 4700uF 63V	D9....14= 1N4002
R5= 8.2Kohm	C4= 68uF 63V	D15= MR501
R6-10= 12Kohm	C5= 47uF 40V	Q1 = MPSL01
R8= 470ohm Lin.	C6-15= 10nF 100V polyester	Q2= 2N4923
R9= 1.2Kohm	C7-12= 100nF 100V polyester	Q3-4= 2N3055
R11= 820ohm	C8= 680nF 100V polyester	IC1 = MC1466L Motorola
R13= 560ohm	C9-14= 1uF 40V	T1 =220VAC/ A:34V/4A B:36V/50mA
R14-15= 0.68ohm 2W	C10= 220pF ceramic	F1 = 1A/250V slow Fuse
R16= 330ohm	C11= 10pF ceramic	F2= 2A slow Fuse
R17= 470ohm	C13= 220uF 40V	S1 = 2XON/OFF 10A/250V switch
R18= 470ohm trimmer	D1-4 = 15A Bridge	S2= 2X2 ON 1A switch
R19= 0.22ohm 2W	D5= 1N4002	VA1 = 500μA

SPECIFICATION

Ταση εξόδου (Vout)	0.....30V DC
Ρευμα εξόδου (Iout)	0.....2A DC
Σταθεροποίηση Φορτίου	0.008% ($\Delta I_o=1.5A$)
Σταθεροποίηση Δικτύου	0.01% ($\Delta I_i=20V$)
Σταθερότητα της V_o ($V_o=15V$, $I_o=1A$)	0.2% ($\Delta \theta=15^\circ C$, $\Delta t=90min$)
Κυμάτωση και θόρυβος	1mV pp (20HZ...10MHZ)
Σύνθετη αντίσταση εξόδου ($V_o=10V$, $I_o=1A$)	20mΩ at 1KHZ, 250mΩ at 200KHZ
Θερμοκρασία λειτουργίας (περιβάλλοντος)	0-40° C

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