



TDA5051A DEMOBOARD

Application Note Update

Using the micro-switching power supply on 120V AC power lines

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1 - INTRODUCTION

The purpose of this document is to propose a simple modification of the power supply we have described in the demoboard application note, in order to extend its input voltage range.

The first design was intended to be used on 220-240V AC power lines; main parameters for the lowest and highest input voltages are listed below:

AC Power Line Voltage	DC Rectified Voltage	Switching Frequency	Output Current
160V (Min)	230V	52KHz	100mA
255V (Max)	360V	58KHz	115mA

2 - PRINCIPLE

The purpose of this modification is to allow a lower operating AC input voltage, without changing a large number of power supply components...

Then, the principle consists in using a rectifier- doubler circuit, as shown on the following figure.

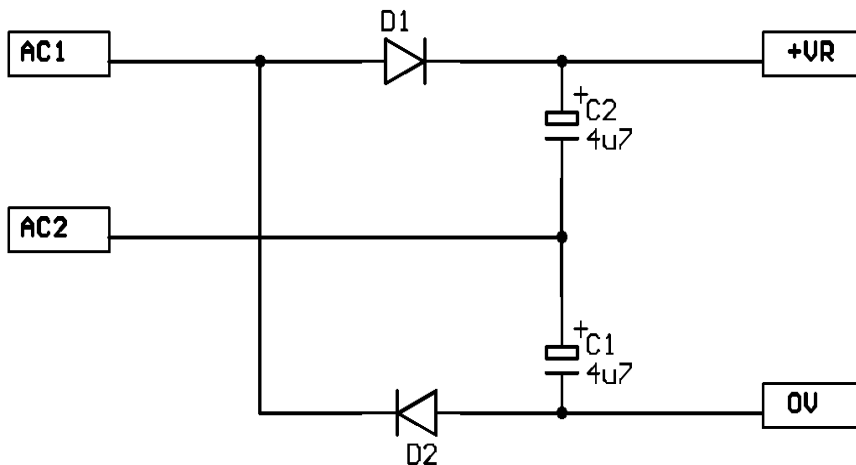


Fig. 1 - AC Rectifier/ Doubler

This circuit could be compared to a set of two single-wave rectifiers with their capacitors. In this diagram, the « positive » sinewave charges C2 through D1 at $V_{in_ac} \cdot \sqrt{2}$ and the « negative » charges C1 through D2 at the same voltage. The capacitors being serially coupled, the total voltage across them is $2 \cdot \sqrt{2} \cdot V_{ac}$.

Then, the new input voltage range becomes:

AC Power Line Voltage	DC Rectified Voltage
80V (Min)	230V
130V (Max)	360V

2 - DEMOBOARD MODIFICATIONS

a- The rectifier bridge P1 is left on its initial placement. It will provide the two rectifier diodes D1 and D2 of the previous diagram.


The filtering capacitor C12 (4u7/400V) must be removed from the board.

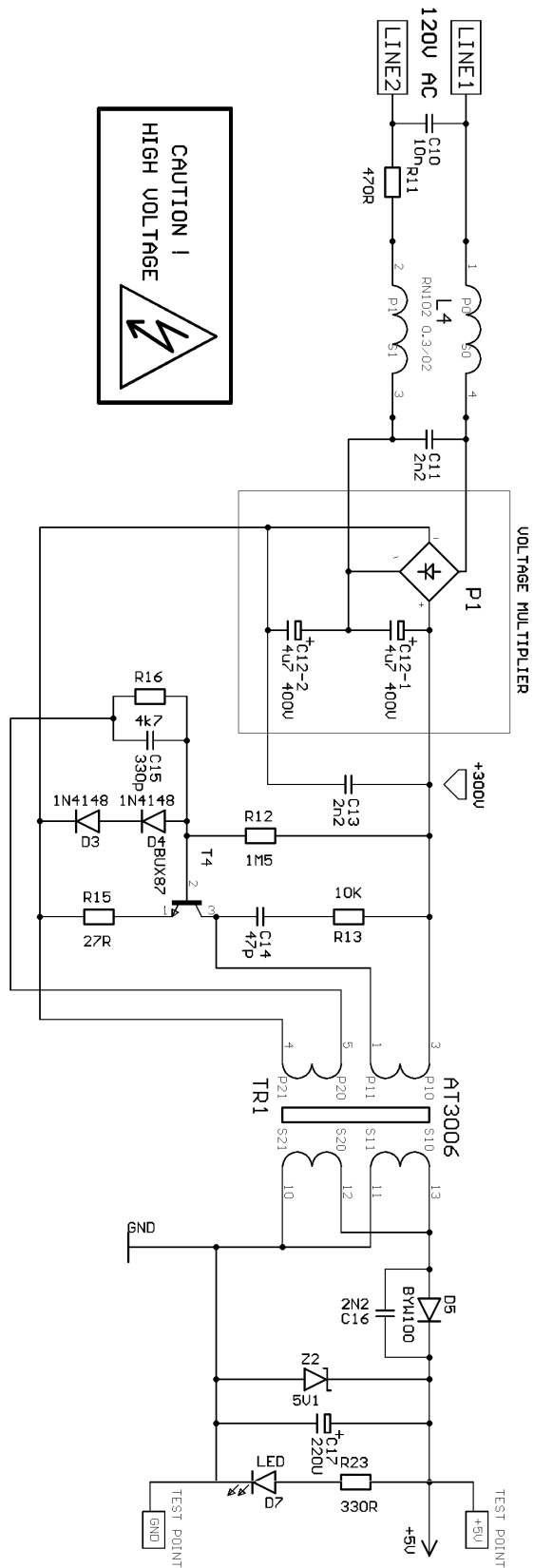
b- Another new capacitor, of the same type and value, must be serially mounted with the old one, according to the following electric diagram.

Then, one of the AC pins of the rectifier bridge is connected to the center-tap of the capacitors assembly.

c- The limiting resistor R11 must be replaced with a 470 Ohms PR01 type, instead of the existing 1K resistor.

BE CAREFUL: VERIFY YOUR WIRING BEFORE CONNECTION TO THE MAINS !

 michat ELECTRONIQUE	TITLE:
	DB120U
Document: 120U AC POWER SUPPLY	
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Note: On the Demoboard,
 R13 = 2x4K7 and C14 = 2x100pF

Fig. 2 - New electric diagram