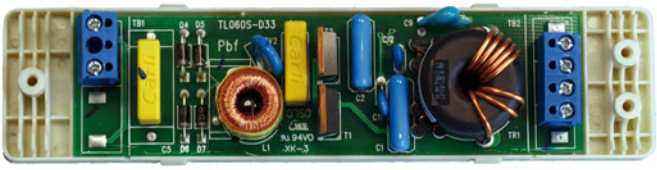
Electronic Transformers

Dear Elektor — as a staunch reader since issue # 1 I'd like to provide some information that's supplemental to your article 'Electronic Transformers Revealed and Explained' in the December 2008 issue.
These 'transformers' are actually switch-mode power supplies or, more accurately, 'power auto oscillators' and most of them are based on application note AN528 from STmicroelectronics. Even if bipolar transistors have been replaced by MOSFETs in recent models, the principle remains the same. The application note provides a detailed operation of these supplies, and has good educational value.
Interesting as that may be, if we look at the schematics in detail, it's apparent that these supplies may be modified to act as **dimmers**. The oscillator is triggered by a diac using an RC network. If a potentiometer with value 10 R is inserted in series with R, a dimmer is created with a range close to 0-100%.
Sure, you have to know a bit about electronics but I would expect Elektor readers to be able to locate the resistor (if necessary, consult the application note), and lift up one of its legs. The resistor value is usually between 100 kΩ and 220 kΩ, depending on the model and the associated capacitor. Do not remove the resistor completely, as it will act as a protection if the pot is set to zero. In the absence of the fixed resistor, a resistance below the original value could well cause the supply to go up in smoke.
An even more exciting modification is to link the potentiometer to a switch. This setup allows a smooth switch-on of the load, which will benefit the life expectancy of the bulbs (effectively preventing the high inrush current when the filament is cold). It is also much more agreeable in the bathroom, particularly in the morning when harsh lights normally greet you there.
Electronics enthusiasts may reap another benefit from these cheap supplies by simply rectifying and smoothing the output voltage, and so make a cheap, powerful, 0 to 15 volts adjustable supply.
Be sure to observe electrical safety, as the potentiometer terminals are connected to the rectified AC mains voltage. A potentiometer with a plastic spindle must be used, preferably in combination with an ABS enclosure.

Alain Caillard (France)



Electronic Transformer for a 12V Halogen Lamp, Fichera, P. and Scollo, R., AN528/0999, STMicroelectronics, 1999. www.st.com/stonline/products/literature/an/3707.pdf

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