

LOW COST HIGHLY MANUFACTURABLE DC-TO-DC POWER CONVERTER

ABSTRACT OF THE DISCLOSURE

A highly manufacturable low cost DC-to-DC power converter uses a control circuit constructed from a '555 type timer IC and a precision voltage reference. The output of the '555 timer is used to drive a MOSFET transistor that alternately energizes and de-energizes a primary winding of a transformer, thereby energizing secondary windings of the transformer. The voltage at the secondary windings is rectified and filtered to form the regulated output supply voltages. A feedback control signal is generated based on a difference between a reference voltage and the a regulated output supply voltage. Based on the feedback control signal, a control window is established within the '555 timer that determines the charging and discharging times of a capacitor. Since the charging and discharging times of the capacitor are exponential, changing the feedback control signal changes the control window, which in turn changes the charging time with respect to the discharging time. While the times change with respect to each other, the sum of the charging time and the discharging time remains relatively constant, so the oscillation frequency remains relatively constant. Accordingly, the present invention achieves pulse width modulation (PWM) type control at a cost much lower than the cost of commercially available controller ICs.

(Figure 2)

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