Low-power converter has galvanic isolation

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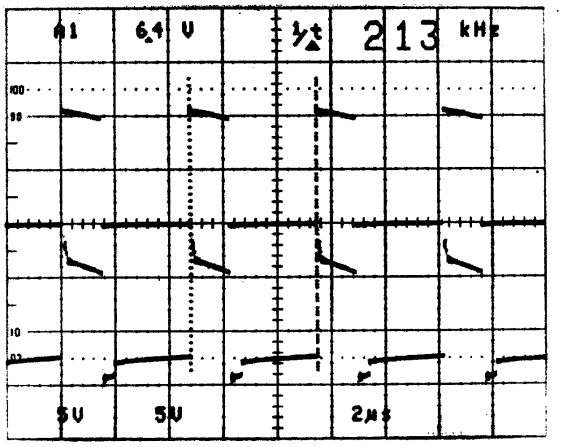
Certain low-power applications require a simple, low-cost, galvanically isolated power supply. **Figure 1** shows a circuit that meets these requirements. The dc/dc converter provides a 12V, 150-mW output using only a few components and a small transformer. The input can come from any power source that supplies 14 to 18V. The CD4049 forms an oscillator that operates at approximately 200 kHz (**Figure 2**). The asymmetry of the oscillator's waveform depends on the value of R. The voltage V_S in **Figure 1** is proportional to the waveform's asymmetry.

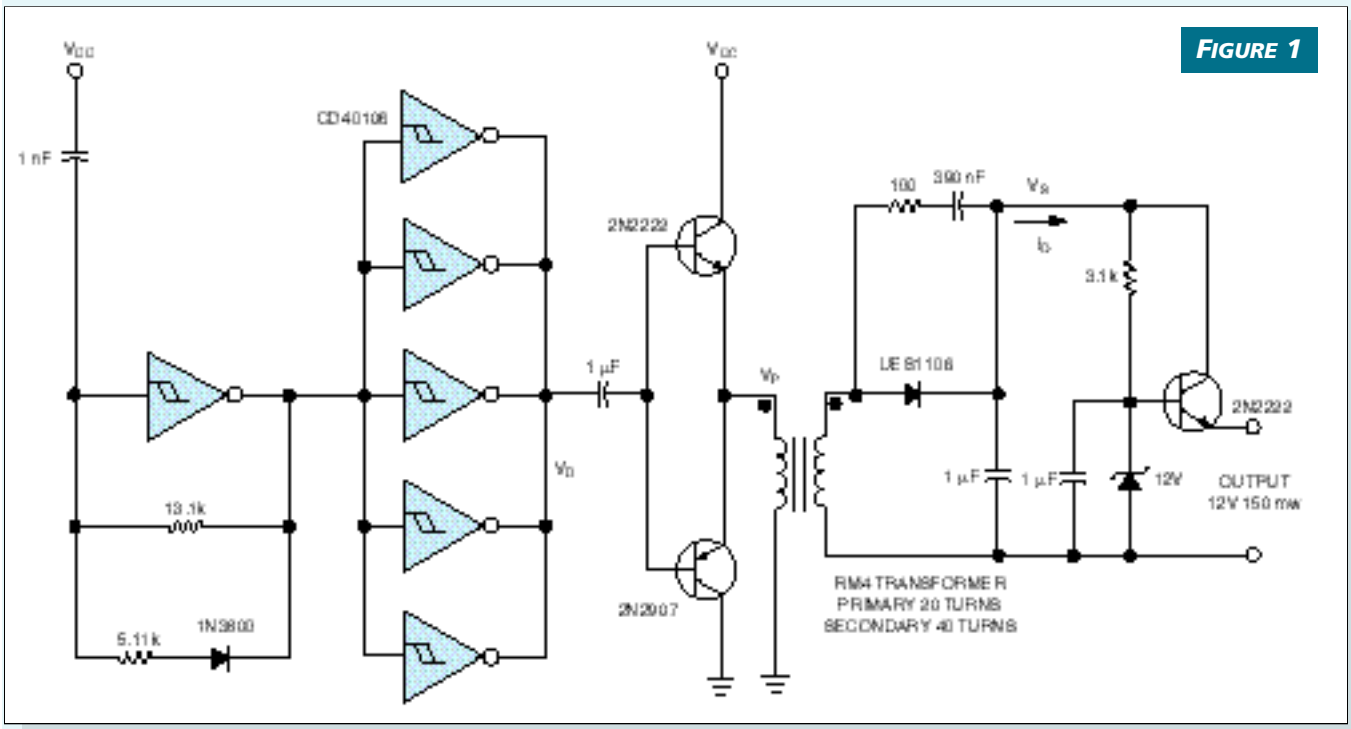
You could also use the circuit as a dc/dc converter with unity transfer ratio by removing the regulator stage at the output. You can easily change the transfer ratio by varying the oscillator's duty cycle (by adjusting R). If you need to increase the output power, remember that in this configuration, the load current flowing through the transformer must be much lower than the magnetizing current. (DI #2214) EDN

FIGURE 2



The symmetry of the waveforms of V_D and V_P in Figure 1 determines the value of V_S.

FIGURE 1



A simple CMOS oscillator, an inexpensive transformer, and a few components form a low-cost, galvanically isolated dc/dc converter