

APPLICATION NOTE 294

Dual-Output SLIC Supply Shares Feedback

Abstract: Some subscriber line-interface cards (SLICs) need both the line and the ringer voltages to be regulated under all conditions. Dual-output SLICs have a power supply that uses feedback-sharing to regulate both outputs

Additional Information:

- [Quick View Data Sheet for the MAX668](#)
- [Technical Support: Power](#)

A similar version of this article appeared in the August 7, 2000 issue of *Electronic Design*.

For some subscriber line-interface cards (SLICs), both the line and the ringer voltages should be regulated under all conditions. The circuit shown in Figure 1 meets this requirement. It accepts a 12V $\pm 10\%$ input, and it delivers 0mA to 400mA from a regulated -24V $\pm 5\%$ output. From a regulated -75V $\pm 5\%$ output, it provides 0mA to 100mA. Features of this circuit include a boost-controller IC in a transformer-flyback topology and an op amp in the inverting configuration. Used as a summing amplifier, this op amp derives shared feedback from the two regulated outputs. The transformer turns ratio is approximately 1:2.4.

Both outputs must remain in regulation even when one operates at full load and the other operates at no load. To ensure that this happens, the two outputs contribute to the IC's feedback signal. The -24V output generates the greater output power and two-thirds of the feedback current. Meanwhile, the -75V output provides the remaining one-third of the feedback current.

Such an arrangement allows the regulator to maintain a $\pm 5\%$ output-voltage tolerance on both outputs—for line variations of $\pm 10\%$, and for any combination of output currents (i.e., zero to full load on either output). For full-load currents at both outputs and a 12V input, the efficiency is 85%.

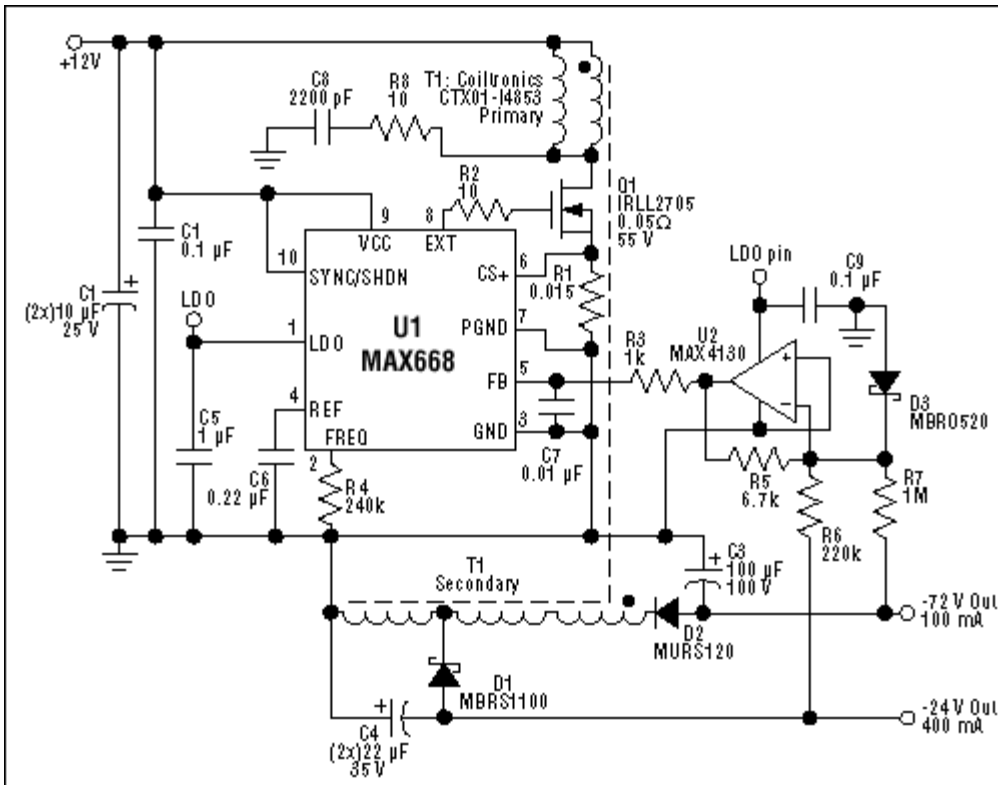


Figure 1. In this circuit, both the line and ringer voltages should be regulated under all conditions.

Notes:

T1: Coiltronics® CTX01-14853 or equivalent.

The general specs are:

Primary L = about 22µH (not critical).

Primary current rating ≥ 6.7A, turns ratio 1:2:2:2.

Q1: Any logic-level (R_{ON} rated at 5V) nFET with similar ratings may be substituted.

Using a combined feedback signal from its two regulated outputs, this power supply for subscriber line-interface cards maintains ±5% regulation on both outputs.

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