Keywords: Autotransformer Boosts Maximum VOUT

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APPLICATION NOTE 496

Autotransformer Boosts Maximum VOUT

Step-up dc-dc converters that operate from small input voltages often have correspondingly low maximum breakdown voltages of 5V to 6V, which limits the maximum output voltage available from such devices. Adding an autotransformer lets you double V_{OUT} without exceeding the IC's breakdown voltage.

A properly wound center-tapped inductor acts like a transformer with a 1:1 turns ratio. Combined with an IC that normally boosts single-cell inputs as high as 6V, it produces a regulated 9V output with no more than 4.5V across the IC (**Figure 1**). The circuit is suitable for use in smoke alarms and other battery-powered equipment. It delivers 30mA at 9V from a 1.1V input, and as much as 90mA at 9V from a 1.5V input.

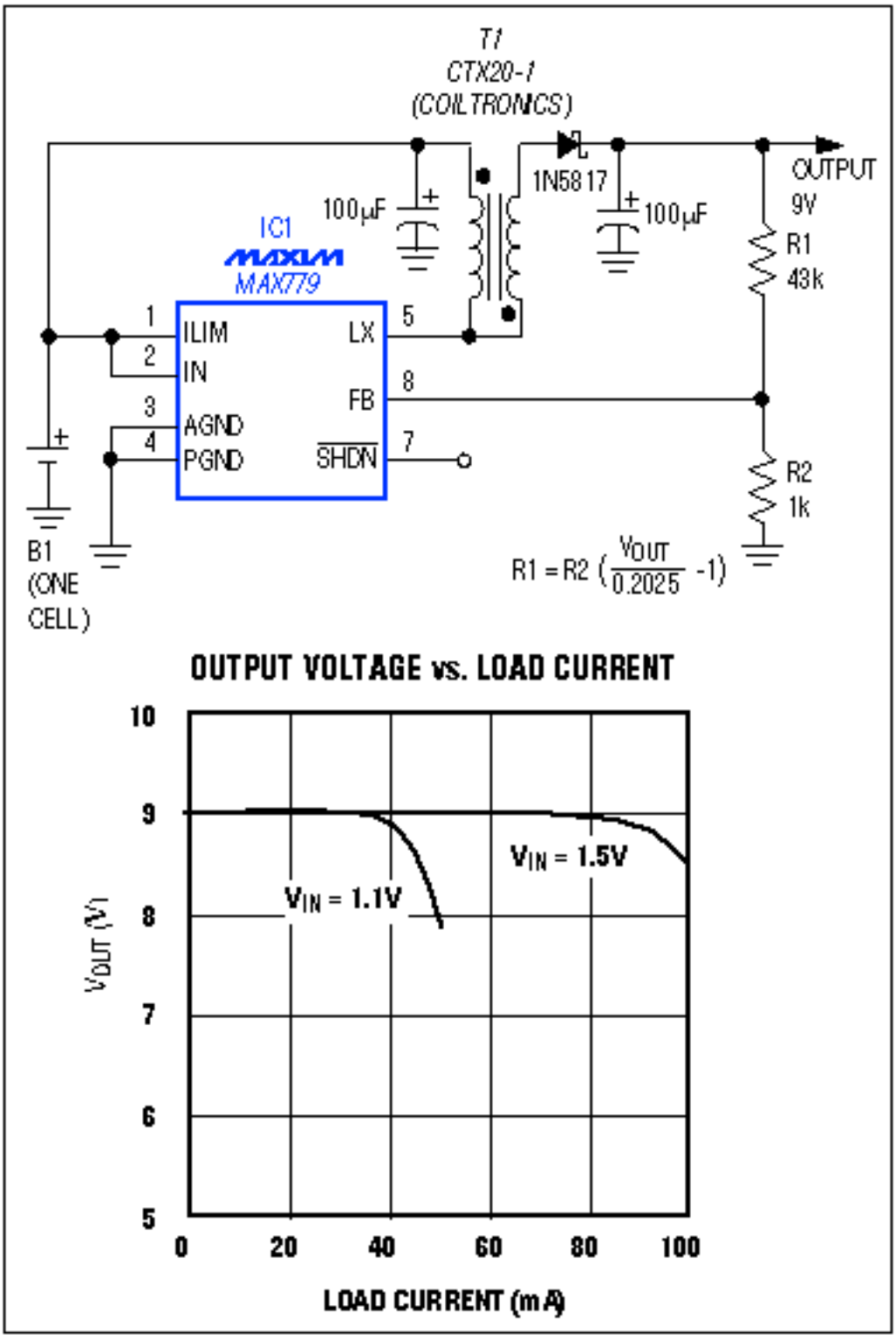

Figure 1. An autotransformer allows a low-voltage step-up converter to boost single-cell inputs as high as 10V.

A similar circuit for 2-cell inputs(**Figure 2**) delivers 30mA at 9V from 1.6V, and 80mA at 9V from 3.6V.

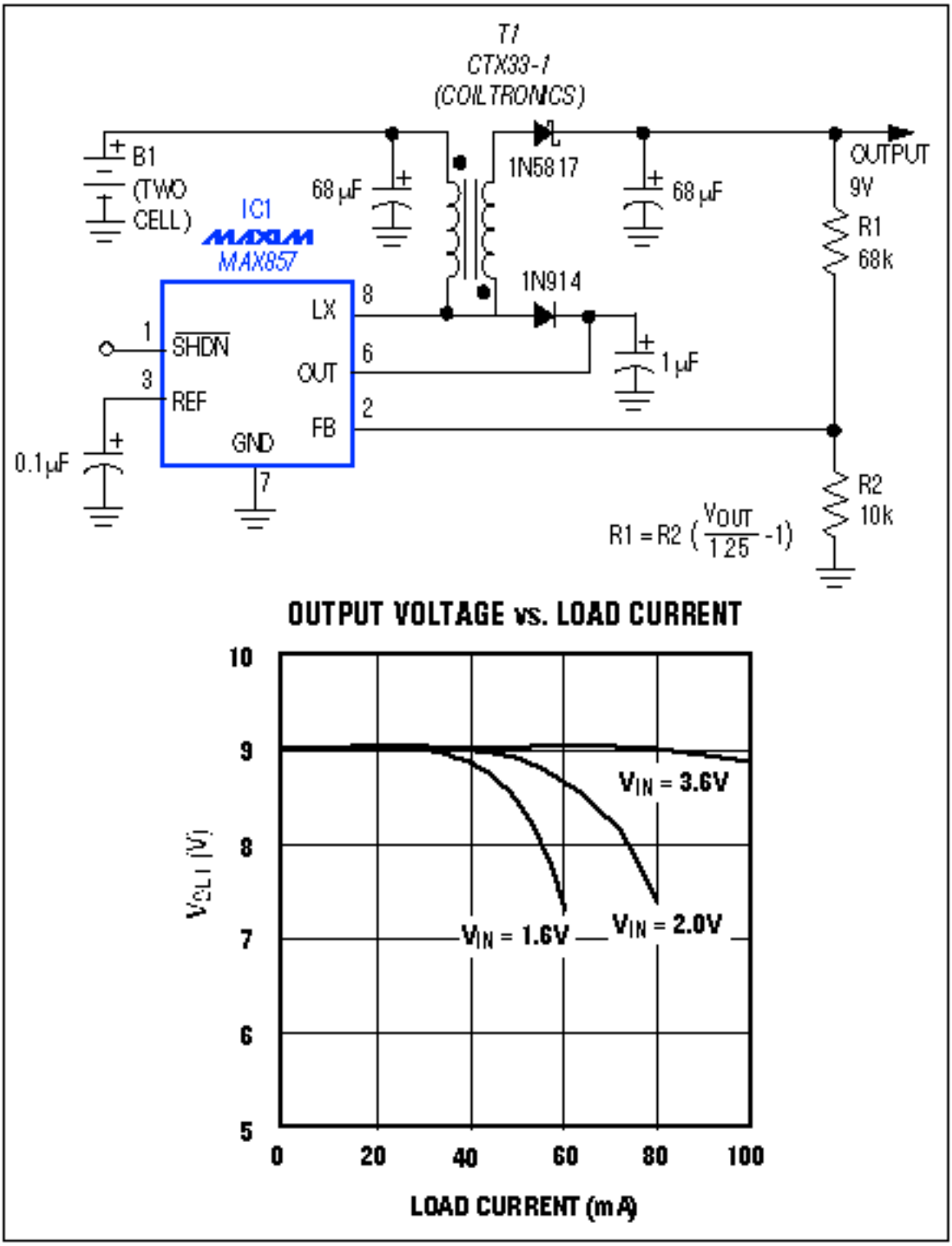

Figure 2. Similar to Figure 1, this circuit accepts 2-cell inputs and generates regulated outputs as high as 10V.

Application Note 496: http://www.maxim-ic.com/an496

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