



APPLICATION NOTE 959

## Dual 600mA Buck Converter for Logic Supply and Core Supply at 1V or Less

The MAX1970 was developed as a dual 600mA buck converter for input voltages as low as 2.6V and output voltages down to 1.2V. However, many current generation CPUs require core supplies of 1V or less. The MAX1970 can be reconfigured with an alternate output feedback sensing circuit to meet this requirement with no sacrifice in regulation. Internally the non-inverting input of the MAX1970 error amplifier is connected to 1.20V reference, which yields a feedback threshold of 1.20V. The circuit of **Figure 1** uses the 2.5V logic supply (Vout2) to bias the feedback divider resistor network, R2 and R3, enabling the other output voltage, Vout1, to be set as:

$$V_{out1} = 1.20V \left( \frac{V_{out2}}{1.20V} \right) \left( \frac{R2}{R3} \right)$$

As seen from the equation above, Vout2 must be greater than 1.20V for Vout1 to be less than 1.20V. In Figure 1, R2 equals to 2K, hence Vout1 = 1.0V. Vout2 is internally program to 2.5V via FBSEL2 (Refer to MAX1970 Data Sheets). Table 1 below shows the measured results of the line, load and cross regulation of Figure 1.

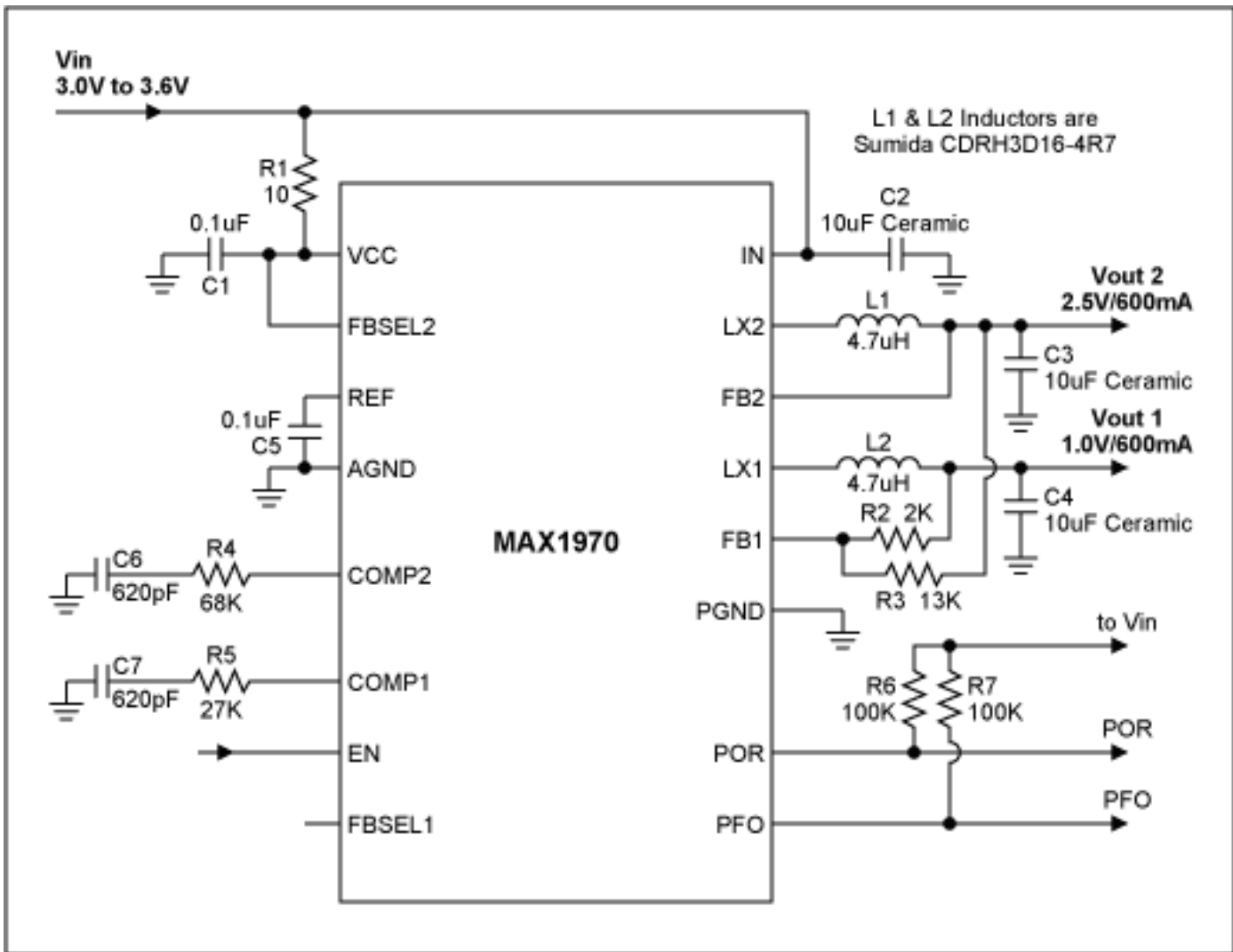


Figure 1. Typical application circuit for 3.3V  $\pm$ 10% input.

Table 1. Measured Results of Line, Load and Cross Regulation

Vin	Iout1	Vout1	Iout2	Vout2
3.0V	10mA	1.001V	10mA	2.507V
3.0V	10mA	1.001V	600mA	2.505V
3.0V	600mA	0.998V	600mA	2.505V
3.0V	600mA	0.998V	10mA	2.507V
3.3V	10mA	1.001V	10mA	2.507V
3.3V	10mA	1.001V	600mA	2.505V
3.3V	600mA	0.998V	600mA	2.505V
3.3V	600mA	0.998V	10mA	2.507V
3.6V	10mA	1.001V	10mA	2.507V
3.6V	10mA	1.001V	600mA	2.505V
3.6V	600mA	1.000V	600mA	2.505V
3.6V	600mA	1.000V	10mA	2.507V

As seen from Table 1, the worst-case voltage variation for Vout1, the 1.0V output, is less than 0.3% for all combination of input voltages from 3.0V to 3.6V, and output currents from 10mA to 600mA.

Application Note 959: <http://www.maxim-ic.com/an959>

### **More Information**

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### **Related Parts**

MAX1970: [QuickView](#) -- [Full \(PDF\) Data Sheet](#) -- [Free Samples](#)

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