



Keywords: buck converter, step-down regulator, 1V core supply, 1V logic supply

APPLICATION NOTE 959

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

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Abstract: This application note shows how to reconfigure the MAX1970 2.5V buck converter for logic and core supplies less than 1V. Schematic is shown. Data for load, line, and cross regulation are given.

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's 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 (V_{OUT2}) to bias the feedback divider resistor network, R2 and R3, enabling the other output voltage, V_{OUT1} , to be set as:

$$V_{OUT1} = 1.20V (V_{OUT2} / 1.20V) (R2/R3)$$

As seen from the equation above, V_{OUT2} must be greater than 1.20V for V_{OUT1} to be less than 1.20V. In Figure 1, R2 equals to 2K, hence $V_{OUT1} = 1.0V$. V_{OUT2} is internally program to 2.5V via FBSEL2 (refer to the MAX1970 data sheet). **Table 1** below shows the measured results of the line, load and cross regulation of Figure 1.

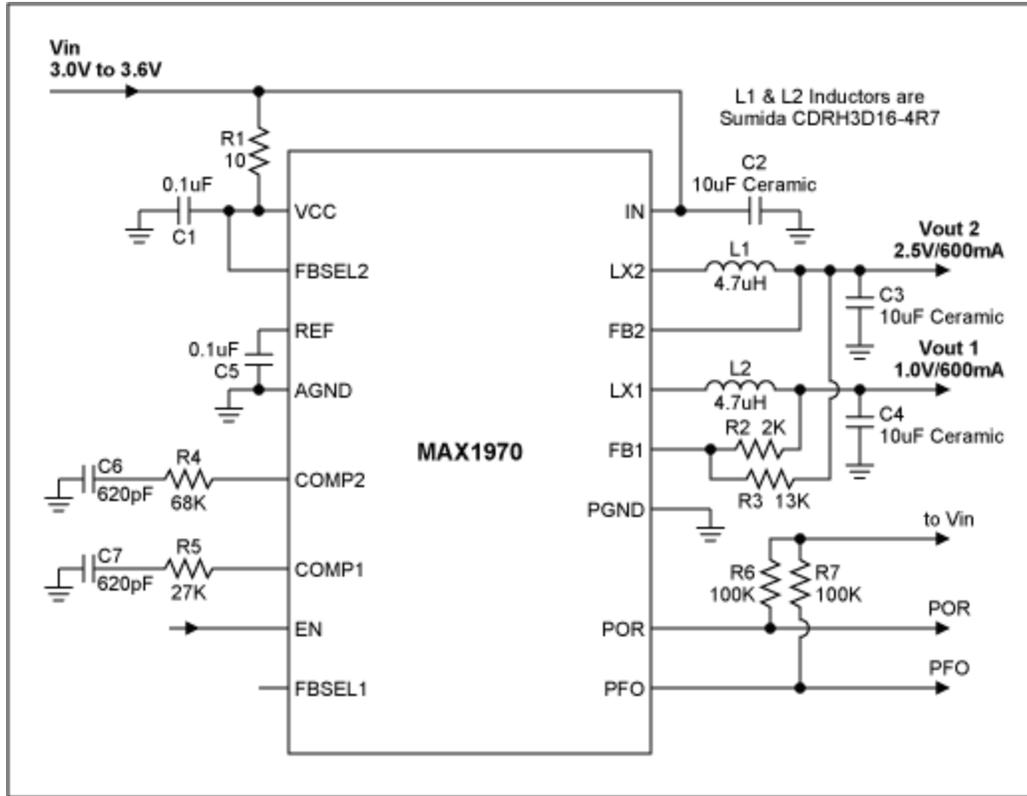


Figure 1.

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

V _{IN}	I _{OUT1}	V _{OUT1}	I _{OUT2}	V _{OUT2}
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 V_{OUT1}, 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.

Related Parts

[MAX1970](#)

Dual, 180° Out-of-Phase, 1.4MHz, 750mA Step-Down

[Free Samples](#)

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