

## The MAX1864 Generates 1.2V or Lower Output Voltage

With most regulators, it is difficult to generate an output voltage that is less than the reference voltage. This note describes a way to use the MAX1864 to achieve an output voltage less than its 1.236V reference.

The MAX1864 includes a positive linear regulator gain block. With a few external resistors, it can achieve an output voltage below 1.236V. Figure 1 shows the schematic of the implementation. Since the voltage at the FB pin is the reference voltage, a lower output voltage,  $V_{OUT1}$ , is obtained if a voltage ( $V_2$ ) higher than the reference voltage is generated. Due to the high input impedance at the FB pin, if  $R_5$  is chosen to be equal to  $R_6$ , we have

$$V_2 - V_{FB} = V_{FB} - V_{OUT1},$$

This yields  $V_2 = 2V_{FB} - V_{OUT1}$ .

To generate a 1.0V output voltage with  $V_{FB} = 1.236V$ ,  $V_2$  should then be 1.472V. This can be achieved by properly choosing the resistance of  $R_8$  and  $R_9$ :

$$R_9 = \frac{V_{FB}}{V_2 - V_{FB}} R_8,$$

If  $R_8 = 10k$ , then  $R_9$  will be 52.4k. Therefore, a 1.0V output voltage is generated.

