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APPLICATION NOTE 906

The MAX1864 Generates 1.2V or Lower Output Voltage

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Abstract: Article shows how a regulator can generate an output voltage that is less than the reference voltage. Circuit generates a 1.0V output voltage. The MAX1864 triple-output power supply is featured.

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, VOUT1, is obtained if a voltage (V2) higher than the reference voltage is generated. Due to the high input impedance at the FB pin, if R5 is chosen to be equal to R6, we have

$$V2 - V_{FB} = V_{FB} - V_{OUT1},$$

This yields $V2 = 2V_{FB} - V_{OUT1}$.

To generate a 1.0V output voltage with $V_{FB} = 1.236V$, V2 should then be 1.472V. This can be achieved by properly choosing the resistance of R8 and R9:

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

If $R_8 = 10k\Omega$, then R9 will be 52.4k Ω . Therefore, a 1.0V output voltage is generated.

