

Linear Products

Low Power 150-mA Low Dropout (LDO) Linear Regulators Extended Output Voltage Adjustment Range (0 V - 3.5 V)

The TPS76301 low-dropout (LDO) adjustable linear regulator generates a regulated 1-V output from an input voltage ranging from 3 V to 6 V. The application circuit is based on the application detailed in the TPS76301 data sheet (TI Literature number SLVS181A, Figure 21) except for the auxiliary circuit, which is shown here in Figure 1.

By means of external resistors and a voltage reference (R1–R4 and U1), the output voltage is adjusted to provide an output voltage that is either above or below the TPS76301 nominal, internal reference voltage of 1.192-V. The TPS76301 produces a regulated output voltage by increasing V_O if the voltage present at the FB pin (4) is less than the internal reference and vice versa for an FB voltage greater than the internal reference. This scheme generates any output voltage ranging between 0 V and 3.5 V (assuming there is sufficient input voltage for a desired output voltage).

The application has the following specifications:

- 150-mA Low-Dropout Regulator
- 0 V – 3.5 V Adjustable Output Voltage
- Dropout Voltage, Typically 300 mV at 150 mA
- Thermal Protection
- Over Current Limitation
- Less Than 2 mA Quiescent Current in Shutdown Mode
- 40°C to 125°C Operating Junction Temperature Range
- 5-Pin SOT-23 (DBV) Package

For applications requiring an output voltage of less than 1.192 V, use a 130 kΩ resistor as shown in Figure 1. Remove R4 and calculate the value of R3 using the following equation:

$$R3 = R2 \times \frac{V_{FB} - V_O}{V_{Ref} - V_{FB}}$$

Where $V_{FB} = 1.192 \text{ V}$ and $V_{Ref} = 2.495 \text{ V}$

For applications requiring an output voltage greater than 1.192 V, use the information provided in the data sheet (literature number SLVS181A) and remove resistors (R1) and (R2), capacitor (C2), and voltage reference (U1).

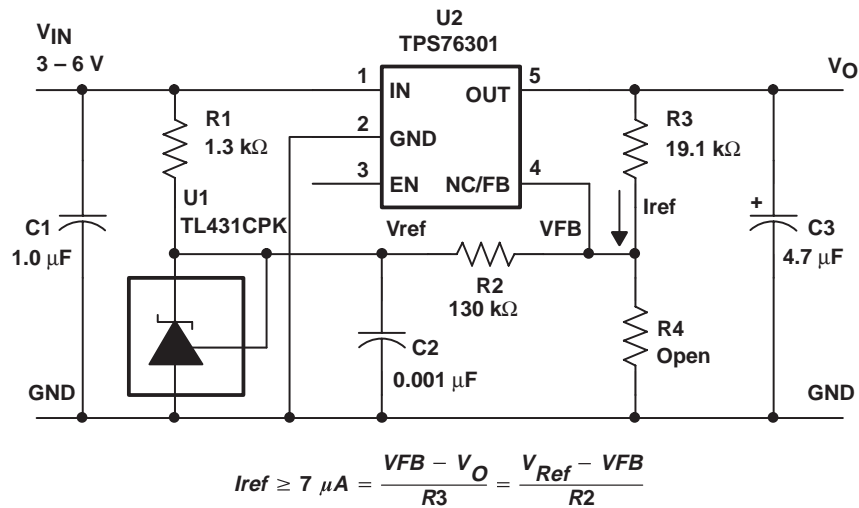


Figure 1. TPS76301 1-V Output Application Circuit