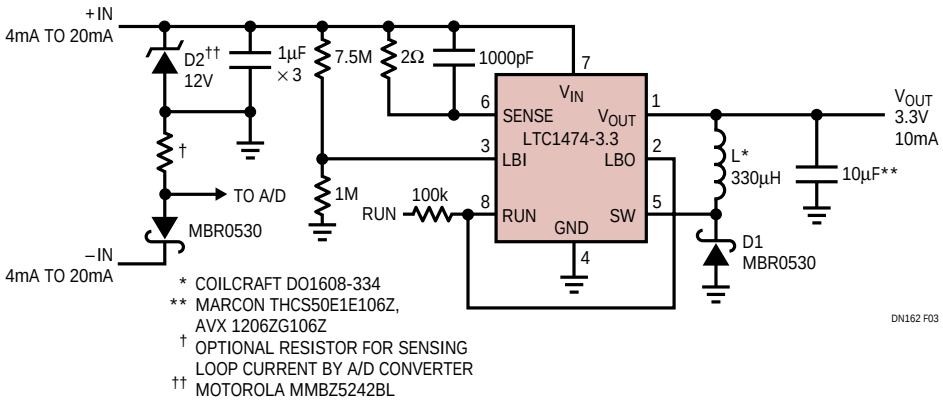
DC/DC Converter Delivers 3.3V/10mA from 4-20mA Loop Power

The LTC1474 is a step-down switching regulator that draws only 10µA supply current at no load while maintaining the output voltage. Its high efficiency and 100% duty cycle capability allow the LTC1474 to provide maximum energy to the load in applications where the input supply can only provide limited current. The peak inductor current is programmable via an optional current sense resistor for lower voltage ripple, lower noise and less stress on alkaline batteries and other components.

The circuit shown is a 3.3V/10mA regulator that extracts its power from a 4mA to 20mA loop. This circuit demonstrates how an LTC1474-based regulator can be optimized for very low current applications. The 2Ω sense resistor limits the peak inductor current to 40mA to minimize current ripple and provide good efficiency (84%). The Zener diode at the input clamps the input voltage to 12V, which is then converted to 3.3V. This enables the 4mA minimum input current to be more than doubled at the output.



* COILCRAFT DO1608-334
** MARCON THCS50E1E106Z,
AVX 1206ZG106Z
† OPTIONAL RESISTOR FOR SENSING
LOOP CURRENT BY A/D CONVERTER
†† MOTOROLA MMBZ5242BL

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