The LT1930 is the only SOT-23 switching regulator in the industry that includes an integrated 1A switch. The LT1930 utilizes a constant frequency, internally compensated, current mode PWM architecture. Its 1.2MHz switching frequency allows the use of tiny, low cost capacitors and low profile inductors. With an input voltage range of 2.6V to 16V, the LT1930 is a good fit for a variety of applications. The onboard switch features a low \( V_{\text{CESAT}} \) voltage of 400mV at 1A, resulting in very good efficiency even at high load currents.

Figure 1 shows a typical 3.3V to 5V boost converter using the LT1930. The circuit can provide an impressive output current of 480mA. The efficiency remains above 83% over a wide load current range of 60mA to 450mA, reaching 86% at 200mA. The maximum output voltage ripple of this circuit is 40mV peak-to-peak, which corresponds to less than 1% of the nominal 5V output. Figure 2 is an oscilloscope photograph of the transient response. The lower waveform represents a load step from 200mA to 300mA, the middle waveform shows the inductor current and the upper waveform shows the output voltage. The output voltage remains within 1% of the nominal value during the transient steps and displays a well damped response with little ringing.

Another typical application is a 5V to 12V boost converter, as shown in Figure 3. This circuit can provide 300mA of output current with efficiencies as high as 87%. The maximum output voltage ripple of this circuit is 60mV peak-to-peak, which corresponds to 0.05% of the nominal 12V output. Figure 4 is an oscilloscope photograph of the transient response. The lower waveform shows a load current step from 200mA to 250mA. The middle waveform displays the inductor current and the upper waveform shows the output voltage. The continued on page 20
than –100dB for a ±1.25V, 100kHz input, so it does not degrade the AC performance of the ADC. Typical performance is shown in Figure 5.

Another advantage of operating in differential mode is that common mode errors of the ADC can be reduced. In single-ended mode, the ADC sees a common mode signal at its inputs that is one-half of the input signal. With the LTC1604’s minimum CMRR of 68dB, this can result in significant gain and offset errors at the ADC output. In differential mode, only the LT1469 amplifiers see a common mode at their inputs, which results in negligible errors thanks to the 96dB CMRR of these amplifiers. The common mode signal at the ADC input is now always 0V.

The buffer also drives the ADC from a low source impedance. Without a buffer, the LTC1604 acquisition time increases with increasing source resistance above 100Ω and therefore the maximum sampling rate must be reduced. With the low noise, low distortion LT1469 buffer, the ADC can be driven at the maximum speed from higher source impedances without sacrificing AC performance.

The DC requirements for the ADC buffer are relatively modest. The input offset voltage, CMRR and non-inverting input bias current through the source resistance, Rs, affect the DC accuracy, but these errors are an insignificant fraction of the ADC offset and full-scale errors.

**Conclusion**

The LT1469 provides two fast and accurate amplifiers in a single 8-lead SO or PDIP package. The unrivaled combination of speed and accuracy make it the component of choice for many 16-bit systems.

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**LT1930, continued from page 17**

![Figure 3a. 5V to 12V/300mA step-up DC/DC converter](image)

**Figure 3a. 5V to 12V/300mA step-up DC/DC converter**

![Figure 4. Transient response of Figure 3a’s circuit](image)

**Figure 4. Transient response of Figure 3a’s circuit**

![Figure 5. 4096 point FFT of ADC output for Figure 4’s circuit](image)

**Figure 5. 4096 point FFT of ADC output for Figure 4’s circuit**

output voltage remains within 1% of the nominal value during both transient steps.

These applications demonstrate that the LT1930 is the industry’s highest power SOT-23 switching regulator. In addition to step-up or boost converters, the LT1930 can be used in single-ended primary inductance converters (SEPIC) and flyback designs. The LT1930 is pin compatible with both the low power LT1613 and the micropower LT1615, providing a simple upgrade path for users of the older parts who need more power.