

Figure 3. Half-bridge interface

overall errors typically summing to less than 3ppm of V_{REF} , this corresponds to six digits of accuracy.

The LTC2410's 2-terminal reference and 2-terminal input have common mode input ranges extending from GND to V_{CC} , independent of each other. As a result, ratiometric voltage measurements can be made directly with the LTC2410. As shown in Figure 2, the absolute accuracy of the LTC2410 enables reversal of input leads without shifts in the output code. For example, if V_{REF+} is tied to 5V, V_{REF-} is tied to 0V, V_{IN+} is tied to 3V and V_{IN-} is tied to 0V, the ADC will output a code corresponding to +3/5 of full-scale to within 3ppm. On the

other hand, if V_{IN+} is tied to 0V and V_{IN-} is tied to 3V (the input leads reversed), the ADC output will read -3/5 of full-scale to within 3ppm.

Half-Bridge Interface

Applications using RTDs and thermistors benefit from the large input common mode range of the LTC2410. As shown in Figure 3, this flexibility allows the reference resistor to directly drive the reference input and the RTD/thermistor to directly drive the input. Nonlinearity errors over the output voltage span of the RTD are eliminated using this configuration.

Simultaneous 50Hz and 60Hz Rejection

Many applications require simultaneous 50Hz and 60Hz rejection. While the LTC2410 offers pin-selectable 50Hz or 60Hz rejection, the LTC2413 simultaneously rejects both frequencies to 140dB common mode and 87dB normal mode. This is useful in applications where the destination country (line frequency) is unknown and a jumper or switch to select either 50Hz or 60Hz rejection is not practical.

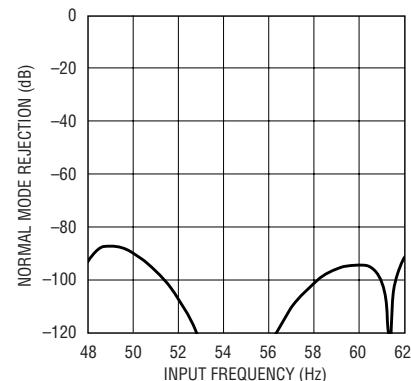


Figure 4. Simultaneous 50Hz/60Hz rejection

Conclusion

Linear Technology has introduced a new family of fully differential delta sigma analog-to-digital converters. The family consists of the LTC2410, a 800nV_{RMS} noise device with 3ppm total unadjusted error, a pin/performance compatible simultaneous 50Hz/60Hz rejection device, the LTC2413, and the tiny (10-pin MSOP) LTC2411. These devices allow a direct connection to bridge sensors as well as a novel half-bridge interface. Their absolute DC accuracy rivals the performance of 6-digit DVMs. 