

Low Power/High Performance 16-Bit A/D Converter

ADC1143

FEATURES

Low Power Consumption: 175mW max, Vs = \pm 15V 150mW max, Vs = \pm 12V **Guaranteed Nonlinearity:** ±0.006% FSR max (ADC1143J) ±0.003% FSR max (ADC1143K) **Guaranteed Differential Nonlinearity:** ±0.006% FSR max (ADC1143J) ±0.003% FSR max (ADC1143K) Low Differential Nonlinearity T.C.: ±2ppm/°C max (ADC1143J) ±1ppm/°C max (ADC1 143K) **Fast Conversion Time:** 70µs max (ADC1143J) 100µs max (ADC1143K) Wide Power Supply Operation: $Vs = \pm 11.4V \text{ to } \pm 18.0V$ VD = +3.0V to +18.0V

APPLICATIONS Seismic Data Acquisition Oil Well Instrumentation Portable Industrial Scales Portable Test Equipment Robotics

GENERAL DESCRIPTION

The ADC1143 is a low power 16-bit successive-approximation analogto-digital converter with a maximum power consumption of 175mW at Vs = $\pm 15V$, 150mW at Vs = $\pm 12V$, and is contained in a 2" x 2" x 0.4" module.

High performance like integral nonlinearity of $\pm 0.006\%$ FSR (ADC1143J)/ $\pm 0.003\%$ FSR (ADC1143K) and differential nonlinearity of $\pm 0.006\%$ FSR (ADC1143)/ $\pm 0.003\%$ FSR (ADC1143K) are guaranteed. Additional guaranteed performance includes: differential nonlinearity T.C. of $\pm 2ppm/^{\circ}C$ (ADC1143J)/ $\pm 1ppm/^{\circ}C$ (ADC1143K), offset T.C. $\pm 40\mu V/^{\circ}C$ and gain T.C. $\pm 12ppm/^{\circ}C$.

The ADC1143 makes extensive use of CMOS integrated circuits and thin-film components to obtain low power consumption, excellent performance and small size. The internal 16-bit CMOS DAC incorporates proprietary thin-film resistor technology and proprietary current steering switches. CMOS successive-approximation registers, low power comparator and low noise reference are also used to optimize the performance of the ADC1143 (shown in Figure 1).

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The ADC1143 can operate with power supply voltages ranging from $\pm 11.4V$ dc to $\pm 8.0V$ dc for Vs and $\pm 3V$ dc to $\pm 18V$ dc for the VD supply. An internal voltage reference is provided, but an external reference can be used. Five analog input voltage ranges are selectable via user pin programming: $\pm 5V$, $\pm 10V$, $\pm 20V$, $\pm 5V$ and $\pm 10V$. Digital output coding in unipolar operation is true binary; for bipolar operation, the coding is offset binary or two's complement. Digital outputs are provided in both parallel and serial formats.



Figure 1. ADC1143 Functional Block Diagram

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