Texas Instruments - September 09, 2014

DALLAS, Sep. 9, 2014 /PRNewswire/ -- Texas Instruments (TI) (NASDAQ: TXN) is enabling system designers to reduce the size of their industrial monitoring and control applications with its newest successive approximation register (SAR) analog-to-digital converters (ADCs). The ADS7042 is the industry's smallest and lowest-power 12-bit SAR ADC, and the ADS8354 family includes the industry's smallest 14- and 16-bit, simultaneous-sampling SAR ADCs. For more information about the ADS7042 and ADS8354 family, visit www.ti.com/saradc-pr.
**ADS7042**
The 1-MSPS ADS7042 pushes the boundaries of size and power. The tiny device uses only 690 uW of power at full speed and scales consumption down with sampling rate to unprecedented levels for use in ultra-low-power systems. At 1 kSPS, for example, the ADS7042 consumes less than 1 uW of power, enabling its use in remote system monitoring and energy harvesting applications. It can also be used in motor control, metering, and portable medical equipment, as well as space-constrained consumer applications, such as hard disk drives, computer peripherals, wearable fitness and smart phones.

**Key benefits of ADS7042:**

- **Enables industry's smallest sensor module designs:** Tiny 1.5-mm by 1.5-mm package is 44 percent smaller than competitive devices.
- **Ultra-low power:** Uses 52 percent less power than competitive devices.
- **Simple serial peripheral interface:** Achieves 1-MSPS throughput with only a 16-MHz clock, 67 percent lower than the competition, which enables a seamless connection to most low-power processors, including TI's MSP430™ microcontrollers.

**ADS8354 family**
The 2-channel ADS8354 family includes the industry's smallest 14- and 16-bit simultaneous sampling SAR ADCs. With data rates ranging from 600 kSPS- to 2 MSPS-per-channel, no latency and dual, independently controllable internal voltage references, the family is optimized for the industrial market, most notably motor control, DC load control, optical networking, power quality, industrial automation and programmable logic controllers (PLCs).

**Key benefits of the ADS8354 family:**

- **Saves board space:** Measures only 3 mm by 3 mm with two independently programmable voltage references, which enables separate full-scale ranges per channel. This reduces the need for external signal conditioning circuitry and cuts overall board space to further shrink industrial designs.
- **Large family provides design flexibility:** 12-, 14- and 16-bit family includes 11 devices with data rates from 600 kSPS to 2 MSPS and with single-ended or differential inputs, which allows designers to more easily customize the analog signal chain to meet their industrial system needs.
- **Flexible interface with fast response time:** Enables fast, no latency motor control with a simple, configurable 18-MHz or 32-MHz clock.

**Tools and support to speed design**
TI offers a broad range of support tools for the ADS7042 and ADS8354 family to speed time to market, including hardware demonstration kits, reference designs and simulation models.

System designers can evaluate the ADS7042 and ADS8354 family in a fraction of the time with performance demonstration kits (PDKs) that feature a simple one-click installation process. These first-of-their kind ADC demonstration kits include an evaluation module (EVM) and simple capture card for plug-and-play functionality, eliminating online software installations. To further speed evaluation time, the kits' intuitive, easy-to-use graphical user interface (GUI) enables designers to quickly evaluate ADC performance in specific end equipment.

SAR ADC SPICE models to ease system-level design of input and voltage reference drive circuitry and IBIS models to perform timing analyses are available for all of the new devices.

The following TI Designs reference designs provide theory, simulation, calculation, design
methodology and more for designing with the new precision ADCs:

- 12-bit data acquisition system for low-power and ultra-small form factor applications in the following three speed grade options (TIPD168):
  - 1-MSPS data rate for hard disc drives, motor control, motor encoders, optical encoders, and optical modules.
  - 500-kSPS data rate for current monitoring, battery monitoring, electromyography (EMG), skin impedance, and wearable fitness equipment.
  - 1-kSPS data rate for taking tilt, gyro, pressure, temperature, gas, chemical and blood glucose sensor measurements.
- 12-bit, 1-MSPS, dual-channel data acquisition system for optical encoders (TIPD117).

Customer support is available on the Precision Data Converters Forum in the TI E2E™ Community, where engineers can search for solutions, get help, share knowledge and solve problems with fellow engineers and TI experts.

Availability and pricing
The ADS7042 is available today in a 1.5-mm by 1.5-mm QFN for a suggested retail price of $2.10 in 1,000-unit quantities. The ADS7042EVM-PDK may be purchased for US$300 to speed device evaluation.

The ADS8354 family is also available today in the following options and prices:

<table>
<thead>
<tr>
<th>Part number</th>
<th>Resolution</th>
<th>Speed</th>
<th>Analog input</th>
<th>Package options</th>
<th>Device Price*</th>
<th>PDK**</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADS8350</td>
<td>16 bit</td>
<td>750 kSPS</td>
<td>Pseudo differential</td>
<td>3-mm by 3-mm QFN</td>
<td>US$8.00</td>
<td>ADS8350EVM-PDK</td>
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<tr>
<td>ADS8353</td>
<td>16 bit</td>
<td>600 kSPS</td>
<td>Pseudo differential</td>
<td>3-mm by 3-mm QFN, 5-mm by 6.4-mm TSSOP</td>
<td>US$9.00</td>
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<tr>
<td>ADS8354</td>
<td>16 bit</td>
<td>700 kSPS</td>
<td>Fully differential</td>
<td>3-mm by 3-mm QFN, 5-mm by 6.4-mm TSSOP</td>
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<td>1.5 MSPS</td>
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<td>3-mm by 3-mm QFN</td>
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<td>ADS7853</td>
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<td>3-mm by 3-mm QFN, 5-mm by 6.4-mm TSSOP</td>
<td>US$6.00</td>
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<td>2 MSPS</td>
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<td>3-mm by 3-mm QFN 5-mm by 6.4-mm TSSOP</td>
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<tr>
<td>ADS7253</td>
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<td>US$3.50</td>
<td>ADS7853EVM-PDK</td>
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</tbody>
</table>

* All suggested retail prices quoted are for $1,000-unit quantities.
** EVM-PDKs may be purchased for a suggested retail price of US$300.

**Learn more about TI's data converter portfolio by visiting the links below:**

- Sample or evaluate the ADS7042 and ADS8354 family, or check out their datasheets.
- Do you always need an amplifier to drive your SAR ADC? Find out in this blog post.
- Get an introduction to rotary resolvers and encoders in this technical article.
- Learn how to get datasheet values from your SAR ADC in this video.

**About Texas Instruments**

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