

Integrated SAR ADC Family in 4 mm × 4 mm Package



Welcome to an overview of Analog Devices' latest family of integrated SAR analog-to-digital converters.

Systems engineers often require multichannel data acquisition with added temperature sensing in cost and/or space-constrained applications.

There now follows an overview of AD7298 family of SAR ADCs for such applications.

Integrated SAR ADC Family in 4 mm × 4 mm Package



AD7298

- ◆ 8-channel
- ◆ 12-bit resolution
- ◆ Fast throughput: 1 MSPS
- ◆ Internal VREF
- ◆ Internal temperature sensor
- ◆ SPI interface

AD7291

- ◆ 8-channel
- ◆ 12-bit resolution
- ◆ Internal VREF
- ◆ Internal temperature sensor
- ◆ I2C interface

AD7298-1

- ◆ 8-channel
- ◆ Fast throughput: 1 MSPS
- ◆ 10-bit resolution
- ◆ Internal VREF
- ◆ SPI interface



The AD7298 integrates 8 ADC channels, a reference, and a temperature sensor in 4 mm × 4 mm LFCSP package.

The AD7291 is I²C version of the AD7298.

The AD7298-1 is a 10-bit pin for pin compatible variant of the AD7298, without the inclusion of internal temperature sensor functionality.

Benefits of the AD7298, AD7291, AD7298-1

Space Saving

Flexibility

Power Saving



The benefits of the AD7298 family can be viewed in terms of space saving, flexibility, and power saving advantages.

Benefits of the AD7298, AD7291, AD7298-1

Space Saving

- 4 mm × 4 mm
- 1°C accurate temp sensing
- Integrated reference

Flexibility

Power Saving



In a 4 mm × 4 mm LFCSP, these devices offer more functionality per mm² of package area than any similar converters on the market.

The on-board band gap temperature sensor digitizes temperature with a resolution of 0.25°C and ±1°C accuracy, and is useful in determining when a system calibration is required.

A 2.5 V internal reference also offers space-saving advantages, but can be over driven by an external reference if required.

Benefits of the AD7298, AD7291, AD7298-1

Space Saving

- 4 mm × 4 mm
- 1°C accurate temp sensing
- Integrated reference

Flexibility

- -40°C to +125°C
- 1.65 V to 3.6 V interface voltage
- Pin for pin upgrade from 10 bits to 12 bits

Power Saving



In terms of flexibility: guaranteed operation with a temperature range of -40°C to +125°C guarantees functionality and performance in a wide range of operating environments, beneficial in particular for telecommunications end customers.

Moreover, as processor interface voltages continue to decrease, digital interfaces must accommodate ever shrinking voltages, often requiring the use of an external level shifter. A digital interface voltage range of 1.65 V to 3.6 V allows flexibility in terms of direct processor interface, without the requirement of an external level shifter, which of course also lends itself to additional PCB area and cost saving.

Pin for pin compatibility between the AD7298 and AD7298-1 provides ease of upgrading through resolutions.

Benefits of the AD7298, AD7291, AD7298-1

Space Saving

- 4 mm × 4 mm
- 1°C accurate temp sensing
- Integrated reference

Flexibility

- -40°C to +125°C
- 1.65 V to 3.6 V interface voltage
- Pin for pin upgrade from 10 bits to 12 bits

Power Saving

- Via processor interface minimization
- Alert functionality
- On-board sequencer

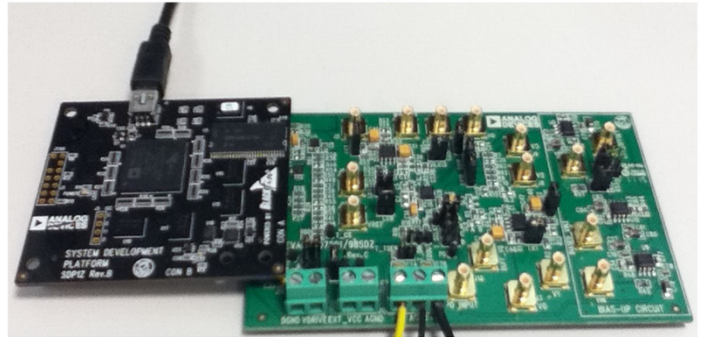
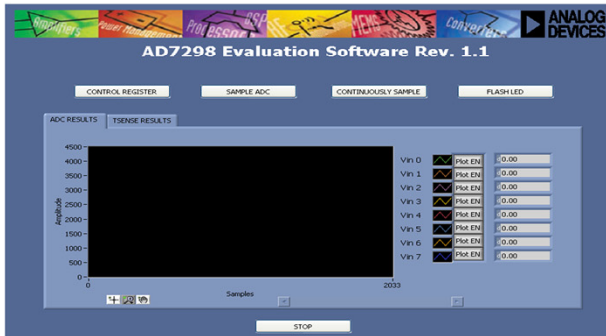


In terms of system power saving, this family offers advantages in minimization of processor interaction. On the AD7291, programmable threshold registers can be programmed for each channel with over- and undervoltage limits. The converter can operate in the background, issuing an alert or interrupt only when the channel has over- or underranged, useful in system monitoring environments, and for avoiding continuous communication between the AD7291 and processor.

Similarly, on all components, on-board sequencer functionality allows multichannel preprogrammability, allowing conversion on a sequence of selected channels, again minimizing processor interaction. These power saving features also have interface ease of use advantages, reducing the complexity of communication with the converter IC.

AD7291 and AD7298 Evaluation Kits

- ◆ EVAL-AD7291SDZ and EVAL-AD7298SDZ
- ◆ Based on new System Demonstration Platform (SDP)
 - Order Code: EVAL-SDP-CB1Z
- ◆ User Guides
 - UG-253
 - UG-254



The AD7291 and AD7298 evaluation kits are based on the new System Demonstration Platform (SDP). The SDP is a hardware and software platform that provides a means to communicate from a PC to ADI products and systems that require digital control and/or readback. The SDP has a Blackfin (ADSP-BF527) at its core and has on-chip USB 2.0 capabilities, as well as many external interface ports such as SPI and I²C.

www.analog.com/AD7298



For more information, including details on pricing, complementary products, and evaluation kits, please visit www.analog.com/AD7298.