AS1542

16-Channel, 1 Msps, 12-Bit ADC with Sequencer

1 General Description

The AS1542 is a 12-bit high-speed, low-power, 16-channel, successive-approximation ADC that operates from a single 2.7 to 5.25V supply. The device features high throughput rates (1Msps) and a low-noise, wide-bandwidth track-and-hold amplifier that can handle input frequencies in excess of 1 MHz.

The AS1542 features 16 single-ended or 8 fully differential analog inputs with a channel sequencer to allow a programmed selection of channels to be converted sequentially. The conversion time is determined by the SCLK frequency (also used as the master clock to control the conversion).

The conversion process and data acquisition are controlled using a chip select pin and a serial clock signal, allowing the device to easily interface with microprocessors or DSPs. The input signal is sampled on the falling edge of CSN and conversion is also initiated at this point. There are no pipeline delays associated with the device.

The AS1542 uses advanced design techniques to achieve very low power dissipation at high throughput rates. At maximum throughput rates, the AS1542 consumes just 2.8mA (@3.6V), and 3.5mA (@5.25V).

By using internal control register, single-ended or fully-differential conversion mode with different input ranges can be used with either straight binary or twos complement output coding.

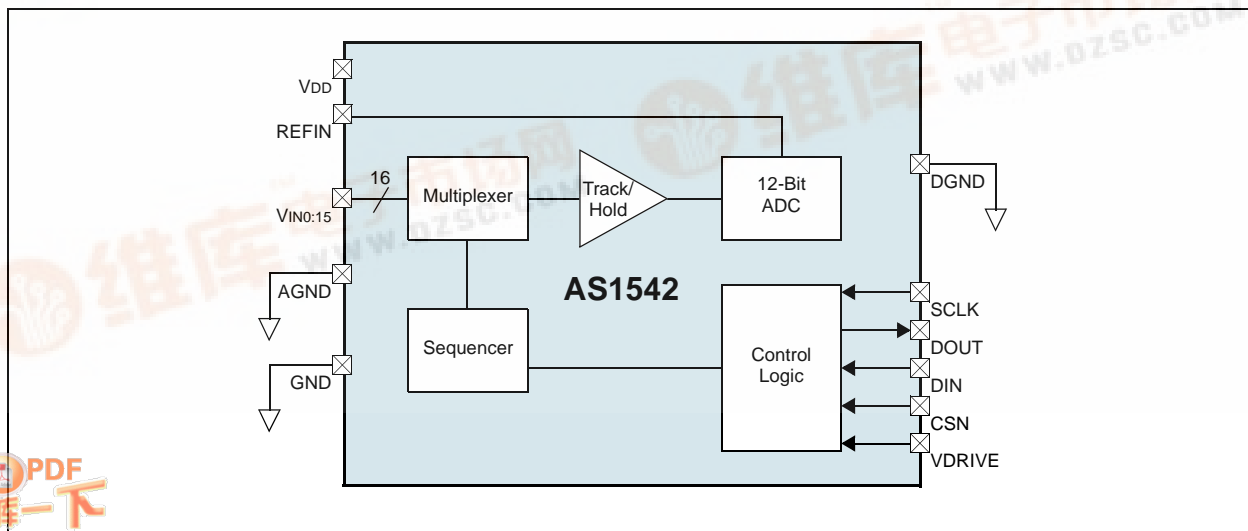The device is available in a TSSOP-28 pin package.

2 Key Features

- Single Supply Operation with V$_{DRIVE}$ Function: 2.7 to 5.25V

- Fast Throughput Rate: 1 Msps

- Sequencer & Channel Counter

- Software-Configurable Analog Input Types:
  - 16-Channel Single-Ended
  - 8-Channel Fully-Differential
- Software-Configurable Input Range
- Low Power Consumption at Max Throughput Rates:
  - 10.1mW @ 1Msps (3.6V Supply)
  - 18.4mW @ 1Msps (5.25V Supply)

- Shutdown Mode Current: 0.5µA
- Flexible Power/Serial Clock Speed Management
- Wide Input Bandwidth: 71dB SNR @ 50 kHz Input Frequency

- No Pipeline Delays

- High Speed SPI/QSPI/Microwire/DSP Interface

- TSSOP-28 Package

3 Applications

The devices are ideal for remote sensors, data-acquisition and data-logging devices, pen-digitizers, process control, or any other space-limited A/D application with low power-consumption requirements.

Figure 1. Typical Application

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