



CIRRUS LOGIC®

勝特力材料 886-3-5753170  
勝特力电子(上海) 86-21-34970699  
勝特力电子(深圳) 86-755-83298787  
Http://www.100y.com.tw

**CS5505/6/7/8**

## Very Low-power, 16-bit & 20-bit A/D Converters

### Features

- Very Low Power Consumption
  - Single supply +5 V operation: 1.7 mW
  - Dual supply  $\pm 5$  V operation: 3.2 mW
- Offers superior performance to VFCs and multi-slope integrating ADCs
- Differential Inputs
  - Single Channel (CS5507/8) and Four-Channel (CS5505/6) pseudo-differential versions
- Either 5 V or 3.3 V Digital Interface
- Linearity Error:
  - $\pm 0.0015\%$  FS (16-bit CS5505/7)
  - $\pm 0.0007\%$  FS (20-bit CS5506/8)
- Output update rates up to 100 Sps
- Flexible Serial Port
- Pin-Selectable Unipolar/Bipolar Ranges

### Description

The CS5505/6/7/8 are a family of low power CMOS A/D converters which are ideal for measuring low-frequency signals representing physical, chemical, and biological processes.

The CS5507/8 have single-channel differential analog and reference inputs while the CS5505/6 have four pseudo-differential analog input channels. The CS5505/7 have a 16-bit output word. The CS5506/8 have a 20-bit output word. The CS5505/6/7/8 sample upon command up to 100 Sps.

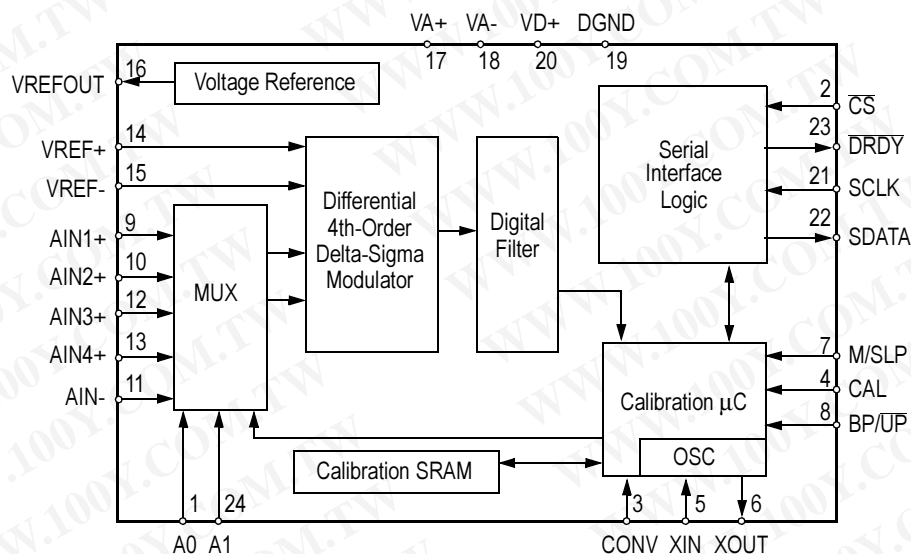
The on-chip digital filter offers superior line rejection at 50 and 60 Hz when the device is operated from a 32.768 kHz clock (output word rate = 20 Sps).

The CS5505/6/7/8 include on-chip self-calibration circuitry which can be initiated at any time or temperature to ensure minimum offset and full-scale errors.

The CS5505/6/7/8 serial port offers two general-purpose modes for the direct interface to shift registers or synchronous serial ports of industry-standard microcontrollers.

### ORDERING INFORMATION

See [page 30](#).



CS5505 (16-BIT) AND CS5506 (20-BIT) SHOWN

**ANALOG CHARACTERISTICS** ( $T_A = T_{MIN}$  to  $T_{MAX}$ ;  $V_{A+} = 5V \pm 10\%$ ;  $V_{A-} = -5V \pm 10\%$ ;  $V_{D+} = 3.3V \pm 5\%$ ;  $V_{REF+} = 2.5V$ (external);  $V_{REF-} = 0V$ ;  $f_{CLK} = 32.768kHz$ ; Bipolar Mode;  $R_{source} = 1k\Omega$  with a  $10nF$  to AGND at AIN; Analog input channel AIN1+; AIN- = AGND; unless otherwise specified.) (Notes 1, 2)

Parameter*	CS5505/7-A			Units
	Min	Typ	Max	
Specified Temperature Range	-40 to +85			°C
<b>Accuracy</b>				
Linearity Error	-	0.0015	0.003	±%FS
Differential Nonlinearity	-	±0.25	±0.5	LSB <sub>16</sub>
Full Scale Error (Note 3)	-	±0.25	±2	LSB <sub>16</sub>
Full Scale Drift (Note 4)	-	±0.5	-	LSB <sub>16</sub>
Unipolar Offset (Note 3)	-	±0.5	±2	LSB <sub>16</sub>
Unipolar Offset Drift (Note 4)	-	±0.5	-	LSB <sub>16</sub>
Bipolar Offset (Note 3)	-	±0.25	±1	LSB <sub>16</sub>
Bipolar Offset Drift (Note 4)	-	±0.25	-	LSB <sub>16</sub>
Noise (Referred to Output)	-	0.16	-	LSB-rms <sub>16</sub>

- Notes:
1. The AIN pin presents a very high input resistance at dc and a minor dynamic load which scales to the master clock frequency. Both source resistance and shunt capacitance are therefore critical in determining the CS5505/6/7/8's source impedance requirements. For more information refer to the text section *Analog Input Impedance Considerations*.
  2. Specifications guaranteed by design, characterization and/or test.
  3. Applies after calibration at the temperature of interest.
  4. Total drift over the specified temperature range since calibration at power-up at 25°C. Recalibration at any temperature will remove these errors.

mV	Unipolar Mode			Bipolar Mode		
	LSB's	% FS	ppm FS	LSB's	% FS	ppm FS
10	0.26	0.0004	4	0.13	0.0002	2
19	0.50	0.0008	8	0.26	0.0004	4
38	1.00	0.0015	15	0.50	0.0008	8
76	2.00	0.0030	30	1.00	0.0015	15
152	4.00	0.0061	61	2.00	0.0030	30

$V_{REF} = 2.5V$

**CS5505/7; 16-Bit Unit Conversion Factors**

\* Refer to the Specification Definitions immediately following the Pin Description Section.

Specifications are subject to change without notice.

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