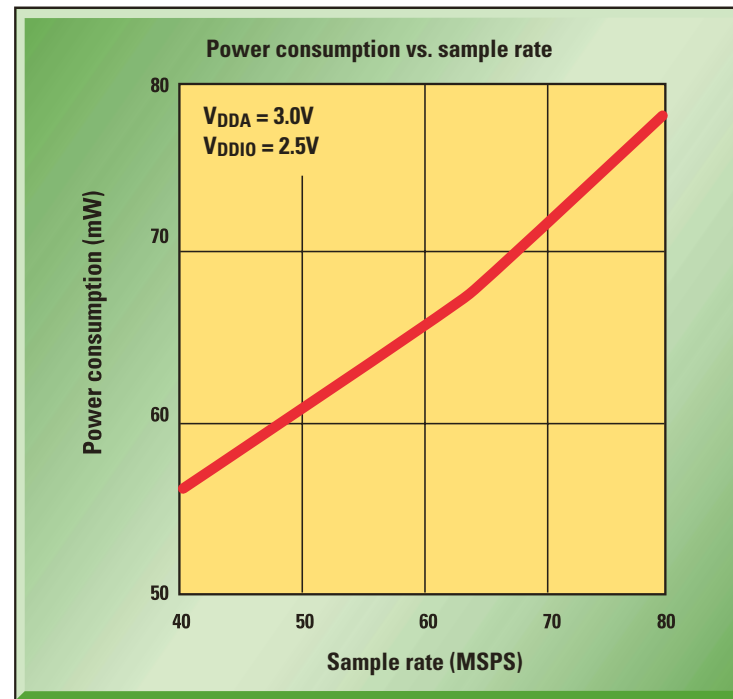


New products

ADC10080/65/40 – High-speed, 10-bit analog-to-digital converters



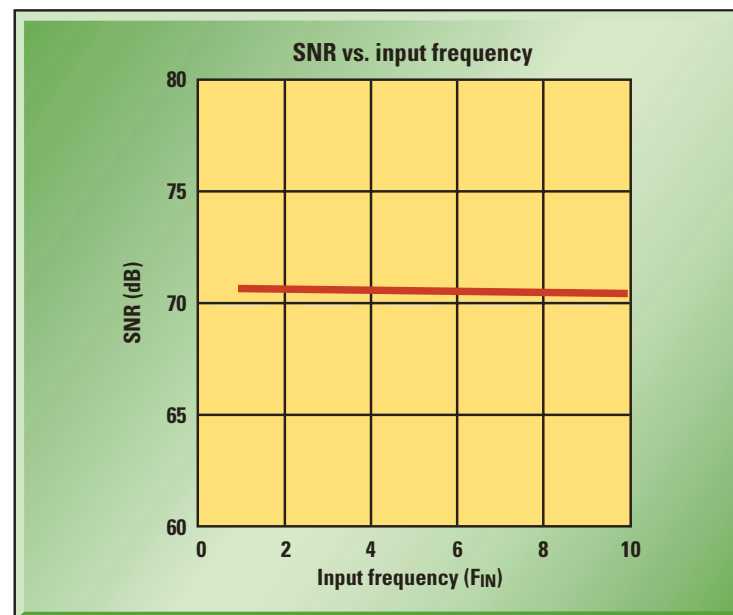
■ Features

- Single 3V operation
- Selectable 1 Vpp, 1.5 Vpp, and 2 Vpp full-scale input swing
- 400 MHz, -3 dB bandwidth
- Power consumption
 - 78.6 mW at 80 MSPS
 - 15 mW in sleep mode
 - Power scales with sample clock frequency
- Offset binary or two's complement data format
- Separate adjustable output driver supply to accommodate 2.5V and 3.3V logic families
- Available in a TSSOP-28 package

■ Applications

- Digital TV, HDTV
- Consumer video
- Communications receivers
- Basestation transceivers
- Ultrasound imaging

ADC12010/12020 – 12-bit, 10 MSPS and 12-bit 20 MSPS analog-to-digital converters



■ Features

- Single 5V operation
- Excellent dynamic performance to beyond Nyquist
- Outputs 2.4V to 5V compatible
- Internal sample-and-hold
- Power-down mode
- On-chip reference buffer
- Available in a LQFP-32 package

■ Applications

- Communications receivers
- Basestation transceivers
- Ultrasound imaging
- Instrumentation
- Industrial applications

National Semiconductor provides a comprehensive set of support services. Product information, including sales literature and technical assistance is available through National's Customer Support Centers.

Europe

Fax: +49 (0) 180-5 30 85 86
 Email: europa.support@nsc.com
 Phone:

Deutsch +49 (0) 69 95 08 62 08
 English +44 (0) 8 70 2 40 21 71
 Français +33 (0) 1 41 91 87 90

Americas

Email: new.feedback@nsc.com
 Phone: 1-800-272-9959

Asia Pacific

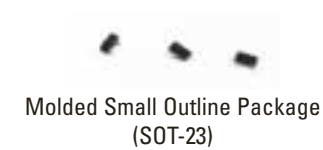
Email: ap.support@nsc.com

Japan

Fax: 81-3-5639-7507
 Email: jpn.feedback@nsc.com
 Phone: 81-3-5639-7560

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To access this selection guide online: www.national.com/appinfo/dcs_selguide.pdf



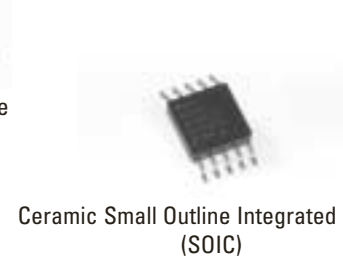
Molded Small Outline Package (SOT-23)



Leadless Leadframe Package (LLP)



Thin Shrink Small Outline Package (TSSOP)



Ceramic Small Outline Integrated Circuit (SOIC)

Winter/Spring 2004



Data conversion products

High-speed analog-to-digital converters

| Part number | Resolution | Speed (MSPS) | Supply voltage | Power (mW) | V _{IN} (V _{PP}) | INL | DNL | ENOB (bit) | SINAD (dB) | SNR (dB) | SFDR (dB) | THD (dB) | Frequency (MHz) | Package |
|-------------|--------------|--------------|----------------|------------|------------------------------------|------------|-----------|------------|------------|----------|-----------|----------|-----------------|----------------------------------|
| ADC08060 | 8-bit | 60 | 3 | 78 | 1.6 | ±0.5 | ±0.4 | 7.6 | 47 | 47 | 63 | -63 | 10 | TSSOP-24, Eval. |
| ADC08100 | 8-bit | 100 | 3 | 130 | 1.6 | ±0.5 | ±0.4 | 7.5 | 47 | 47 | 60 | -60 | 10 | TSSOP-24, Eval. |
| ADC08200 | 8-bit | 200 | 3 | 210 | 1.6 | ±1.0, -0.3 | ±0.4 | 7.3 | 46 | 46 | 60 | -60 | 50 | TSSOP-24, Eval. |
| ADC08351 | 8-bit | 42 | 3 | 40 | 2 | ±0.7 | ±0.6 | 6.8 | 43 | 44 | 49 | -46 | 21 | LLP-24, TSSOP-20, Eval. |
| ADC08L060 | 8-bit | 60 | 3 | 39 | 1.6 | +0.5, -0.2 | ±0.25 | 7.6 | 47.4 | 48 | 59.1 | -56.9 | 10 | TSSOP-24, Eval. |
| ADC1173 | 8-bit | 15 | 3 | 33 | 2 | ±0.5 | ±0.4 | 7.6 | 47.7 | 55 | -54 | 3.58 | | SOIC-24, TSSOP-24, Eval. |
| ADC1175 | 8-bit | 20 | 5 | 60 | 2 | ±0.5 | ±0.35 | 7.3 | 46 | 47 | 58 | -57 | 4.43 | SOIC-24, TSSOP-24, Eval. |
| ADC1175-50 | 8-bit | 50 | 5 | 125 | 2 | ±0.8 | ±0.7 | 7.2 | 45 | 45 | 56 | -54 | 4.4 | LLP-24, SOIC-24, TSSOP-24, Eval. |
| ADC9888 | 8-bit triple | 205 | 3.3 | 1290 | 0.5-1.0 | +1.2/-1.0 | +0.8/-0.6 | - | - | 43.5 | - | - | 41 | PQFP-128 |
| ADC10030 | 10-bit | 27 | 5 | 125 | 2 | ±0.45 | ±0.4 | 9.4 | 58 | 59 | 68 | -66 | 13.5 | LQFP-32, Eval. |
| ADC10040 | 10-bit | 40 | 3 | 55.5 | 2, 1.5, 1 | ±0.3 | ±0.3 | 9.6 | 59.4 | 59.6 | 80 | -77 | 19 | TSSOP-28, Eval. |
| ADC10065 | 10-bit | 65 | 3 | 68.4 | 2, 1.5, 1 | ±0.3 | ±0.3 | 9.5 | 59 | 59.3 | 80 | -72 | 32 | TSSOP-28, Eval. |
| ADC10080 | 10-bit | 80 | 3 | 78.6 | 2, 1.5, 1 | ±0.5 | ±0.25 | 9.5 | 59 | 59.2 | 78.8 | -74.5 | 39 | TSSOP-28, Eval. |
| ADC10321 | 10-bit | 20 | 5 | 98 | 2 | ±0.45 | ±0.35 | 9.5 | 59 | 60 | 72 | -70 | 4.43 | LQFP-32, Eval. |
| ADC10D020 | 10-bit dual | 20 | 3 | 150 | 2 | ±0.65 | ±0.35 | 9.5 | 59 | 59 | 75 | -73 | 4.7 | TQFP-48, Eval. |
| ADC10D040 | 10-bit dual | 40 | 3.3 | 257 | 2 | ±0.65 | ±0.35 | 9.5 | 59 | 60 | 72 | -69 | 10.4 | TQFP-48, Eval. |
| ADC11L066 | 11-bit | 66 | 3.3 | 357 | 2 | ±0.5 | ±0.2 | 10.3 | 64 | 65 | 78 | -74 | 10 | LQFP-32 |
| ADC12010 | 12-bit | 10 | 5 | 160 | 4 | ±0.5 | ±0.3 | 11.3 | 69 | 70 | 83 | -79 | 10 | LQFP-32, Eval. |
| ADC12020 | 12-bit | 20 | 5 | 185 | 4 | ±0.55 | ±0.35 | 11.3 | 69 | 70 | 86 | -83 | 10 | LQFP-32, Eval. |
| ADC12040 | 12-bit | 40 | 5 | 340 | 4 | ±0.7 | ±0.4 | 11.2 | 69 | 69.5 | 84 | -80 | 10 | LQFP-32, Eval. |
| ADC12D040 | 12-bit dual | 40 | 5 | 600 | 4 | ±0.7 | ±0.4 | 10.9 | 68 | 68 | 80 | -78 | 10 | TQFP-64, Eval. |
| ADC12L063 | 12-bit | 62 | 3.3 | 354 | 2 | ±1.0 | ±0.5 | 10.3 | 65 | 66 | 78 | -74 | 10 | LQFP-32, Eval. |
| ADC12L066 | 12-bit | 66 | 3.3 | 357 | 2 | ±1.2 | ±0.4 | 10.7 | 66 | 66 | 80 | -77 | 10 | LQFP-32, Eval. |
| ADC12DL066 | 12-bit dual | 66 | 3.3 | 685 | 2 | ±1.8 | ±0.5 | 10.7 | 66 | 66 | 81 | -78 | 10 | TQFP-64 |
| CLC5955 | 11-bit | 55 | 5 | 640 | 2 | ±2.0 | ±0.8 | - | - | 63 | 72 | - | 75 | TSSOP-48 |
| CLC5957 | 12-bit | 70 | 5 | 640 | 2 | ±1.5 | ±0.65 | - | - | 65 | 72 | - | 75 | TSSOP-48 |

Temperatures
 C = 0°C to +70°C
 I = -25°C to +85°C or -40°C to +85°C
 M = -55°C to +125°C

General purpose 8-bit analog-to-digital converters

| Part number | IO Type | Conv. time (max.) μs | Accuracy (max.) | # Mux inputs | S/H | Supply voltage | Temp. range | Power (max.) | Comments | Package |
|--------------|----------|----------------------|-----------------|--------------|-----|----------------|-------------|--------------|--|---------------------------------|
| 8-bit | | | | | | | | | | |
| ADC0801 | Parallel | 110 | ±1/4 LSB | 1 | N | +5V | I | 9 mW | Differential input and ratiometric operation | MDIP-20 |
| ADC0802 | Parallel | 110 | ±1/2 LSB | 1 | N | +5V | C, I | 9 mW | Differential input and ratiometric operation | MDIP-20, SOIC-20 |
| ADC0803 | Parallel | 110 | ±1/2 LSB | 1 | N | +5V | I | 9 mW | Differential input and ratiometric operation | MDIP-20 |
| ADC08031C | Serial | 8 | ±1 LSB | 1 | Y | +5V | I | 20 mW | | SOIC-14 |
| ADC08032C | Serial | 8 | ±1 LSB | 2 | Y | +5V | I | 20 mW | | SOIC-14 |
| ADC08034C | Serial | 8 | ±1 LSB | 4 | Y | +5V | I | 20 mW | | SOIC-14 |
| ADC08038C | Serial | 8 | ±1 LSB | 8 | Y | +5V | I | 20 mW | | SOIC-20 |
| ADC0804 | Parallel | 110 | ±1 LSB | 1 | N | +5V | C, I | 12.5 mW | Differential input and ratiometric operation | MDIP-20, SOIC-20 |
| ADC0805 | Parallel | 110 | ±1 LSB | 1 | N | +5V | I | 9 mW | Differential input and ratiometric operation | MDIP-20 |
| ADC08061B | Parallel | 0.56 | ±1/2 LSB | 1 | Y | +5V | I | 100 mW | High-speed upgrade for ADC0820 | MDIP-20, SOIC-20 |
| ADC08061C | Parallel | 0.56 | ±1 LSB | 1 | Y | +5V | I | 100 mW | High-speed upgrade for ADC0820 | SOIC-20 |
| ADC08062B | Parallel | 0.56 | ±1/2 LSB | 2 | Y | +5V | I | 100 mW | | MDIP-20, SOIC-20 |
| ADC08062C | Parallel | 0.56 | ±1 LSB | 2 | Y | +5V | I | 100 mW | | SOIC-20 |
| ADC0808 | Parallel | 116 | ±1/2 LSB | 8 | N | +5V | I | 15 mW | | MDIP-28, PLCC-28 |
| ADC0809 | Parallel | 116 | ±1 LSB | 8 | N | +5V | I | 15 mW | | MDIP-28, PLCC-28 |
| ADC08131C | Serial | 8 | ±1 LSB | 1 | Y | +5V | I | 30 mW | Reference guaranteed over temperature | SOIC-14 |
| ADC08134C | Serial | 8 | ±1 LSB | 4 | Y | +5V | I | 15 mW | Reference guaranteed over temperature | SOIC-14 |
| ADC08138C | Serial | 8 | ±1 LSB | 8 | Y | +5V | I | 15 mW | Reference guaranteed over temperature | SOIC-20 |
| ADC0816 | Parallel | 100 | ±1/2 LSB | 16 | N | +5V | I | 15 mW | | MDIP-40 |
| ADC08161C | Parallel | 0.56 | ±1 LSB | 1 | Y | +5V | I | 100 mW | ADC08061 with on-board reference | SOIC-20 |
| ADC0817 | Parallel | 100 | ±1 LSB | 16 | N | +5V | I | 15 mW | | MDIP-40 |
| ADC0820B | Parallel | 1.5 | ±1/2 LSB | 1 | Y | +5V | C | 75 mW | | PLCC-20, SOIC-20 |
| ADC0820C | Parallel | 1.5 | ±1 LSB | 1 | Y | +5V | C | 75 mW | | MDIP-20, SOIC-20 |
| ADC0831C | Serial | 32 | ±1 LSB | 1 | N | +5V | C | 13 mW | | MDIP-8, SOIC-14 |
| ADC0832C | Serial | 32 | ±1 LSB | 2 | N | +5V | C, I | 33 mW | | MDIP-8, SOIC-14 |
| ADC0834B | Serial | 32 | ±1/2 LSB | 4 | N | +5V | C | 13 mW | | MDIP-14 |
| ADC0834C | Serial | 32 | ±1 LSB | 4 | N | +5V | C | 13 mW | | MDIP-14, SOIC-14 |
| ADC0838B | Serial | 32 | ±1/2 LSB | 8 | N | +5V | C | 13 mW | | PLCC-20 |
| ADC0838C | Serial | 32 | ±1 LSB | 8 | N | +5V | C, I | 13 mW | | MDIP-20, PLCC-20, SOIC-20 |
| ADC0844B | Parallel | 40 | ±1/2 LSB | 4 | N | +5V | I | 13 mW | | CERDIP-20 |
| ADC0844C | Parallel | 40 | ±1 LSB | 4 | N | +5V | C, I | 13 mW | | CERDIP-20, MDIP-20 |
| ADC0848B | Parallel | 40 | ±1/2 LSB | 8 | N | +5V | C, I | 13 mW | | MDIP-24, PLCC-28 |
| ADC0848C | Parallel | 40 | ±1 LSB | 8 | N | +5V | C, I | 13 mW | | MDIP-24, PLCC-28 |
| ADC08831 | Serial | 4 | ±1 LSB | 1 | Y | +5V | I | 12 mW | 2 MHz clock frequency | MDIP-8, MSOP-8, SOIC-8, SOIC-14 |
| ADC08832 | Serial | 4 | ±1 LSB | 2 | Y | +5V | I | 18 mW | 2 MHz clock frequency | MDIP-8, MSOP-8, SOIC-8, SOIC-14 |
| ADC7478 | Serial | 1 | ±0.05 LSB | 1 | Y | +3V to +5V | I | 4.8 mW | 1 MSPS, SPI interface | SOT23-6 |
| ADCV0831 | Serial | 16 | ±1.5 LSB | 1 | Y | +2.7V to +5V | C | 1.2 mW | 10 nA shutdown supply current | SOT23-6 |
| ADCV08832 | Serial | 16 | ±0.8 LSB | 2 | Y | +2.7V to +5V | I | 1.7 mW | 0.1 nA shutdown supply current | SOIC-8 |

Temperatures
 C = 0°C to +70°C
 I = -25°C to +85°C or -40°C to +85°C
 M = -55°C to +125°C

General purpose 10-bit and 12-bit analog-to-digital converters

| Part number | I/O type | Resolution (bits) | Conv. time (max.) μs | Accuracy/INL (max.) | # Mux inputs | S/H | Supply voltage | Temp. range | Power (max.) | Comments | Package |
|---------------|-----------|-------------------|----------------------|---------------------|--------------|-----|----------------|-------------|--------------|--|------------------|
| 10-bit | | | | | | | | | | | |
| ADC1005B | Byte-wide | 10 | 50 | ±0.5 LSB | 1 | N | +5V | C, I | 15 mW | | CERDIP-20 |
| ADC1005C | Byte-wide | 10 | 50 | ±1 LSB | 1 | N | +5V | C | 15 mW | | CERDIP-20 |
| ADC10061C | Parallel | 10 | 0.9 | ±1.5 LSB | 1 | Y | +5V | I | 235 mW | 1 MSPS throughput | SOIC-20 |
| ADC10062C | Parallel | 10 | 0.9 | ±1.5 LSB | 2 | Y | +5V | I | 235 mW | 1 MSPS throughput | SOIC-24 |
| ADC10064C | Parallel | 10 | 0.9 | ±1.5 LSB | 2 | Y | +5V | I | 235 mW | 1 MSPS throughput | SOIC-28 |
| ADC10154 | Byte-wide | 10 + sign | 4.4 | ±1 LSB | 4 | Y | +5V | I | 33 mW | Bipolar conversion | SOIC-24 |
| ADC10158 | Byte-wide | 10 + sign | 4.4 | ±1 LSB | 8 | Y | +5V | I | 33 mW | Bipolar conversion | SOIC-28 |
| ADC10461 | Parallel | 10 | 0.9 | ±1 LSB | 1 | Y | +5V | I | 235 mW | AC tested version of ADC10061 | SOIC-20 |
| ADC10462 | Parallel | 10 | 0.9 | ±1 LSB | 2 | Y | +5V | I | 235 mW | AC tested version of ADC10062 | SOIC-24 |
| ADC10464 | Parallel | 10 | 0.9 | ±1 LSB | 4 | Y | +5V | I | 235 mW | AC tested version of ADC10064 | SOIC-28 |
| ADC10664 | Parallel | 10 | 0.47 | ±1.5 LSB | 4 | Y | +5V | I | 235 mW | AC tested, 1.5 MSPS throughput | SOIC-28 |
| ADC10732 | Serial | 10 + sign | 5 | ±1.25 LSB | 2 | Y | +5V | I | 37 mW | Software power-down to 18 μW | SOIC-20 |
| ADC10738 | Serial | 10 + sign | 5 | ±1.25 LSB | 8 | Y | +5V | I | 37 mW | Software power-down to 18 μW | SOIC-24 |
| ADC7477 | Serial | 10 | 1 | ±0.7 LSB | 1 | Y | +3V to +5V | I | 4.8 mW | 1 MSPS, SPI interface | SOT23-6, Eval. |
| 12-bit | | | | | | | | | | | |
| ADC12030 | Serial | 12 + sign | 8.8 | ±1 LSB | 2 | Y | +5V | I | 33 mW | Software power-down to 100 μW | SOIC-16 |
| ADC12032 | Serial | 12 + sign | 8.8 | ±1 LSB | 2 | Y | +5V | I | 33 mW | Software power-down to 100 μW | SOIC-20 |
| ADC12034 | Serial | 12 + sign | 8.8 | ±1 LSB | 4 | Y | +5V | I | 33 mW | Software power-down to 100 μW | MDIP-24, SOIC-24 |
| ADC12038 | Serial | 12 + sign | 8.8 | ±1 LSB | 8 | Y | +5V | I | 33 mW | Software power-down to 100 μW | SOIC-28 |
| ADC12048 | Parallel | 12 + sign | 3.6 | ±1 LSB | 8 | Y | +5V | I | 34 mW | Software power-down to 75 μW | PLCC-44, PQFP-44 |
| ADC12130 | Serial | 12 + sign | 8.8 | ±2 LSB | 2 | Y | +3.3V/+5V | I | 33 mW | Software power-down to 100 μW | SOIC-16 |
| ADC12132 | Serial | 12 + sign | 8.8 | ±2 LSB | 2 | Y | +3.3V/+5V | I | 33 mW | Software power-down to 100 μW | SSOP-20 |
| ADC12138 | Serial | 12 + sign | 8.8 | ±2 LSB | 8 | Y | +3.3V/+5V | I | 33 mW | Software power-down to 100 μW | SOIC-28, SSOP-28 |
| ADC1241 | Parallel | 12 + sign | 13.8 | ±1 LSB | 1 | Y | +5V, ±5V | I | 70 mW | Self calibrating | CERDIP-28 |
| ADC12441 | Parallel | 12 + sign | 13.8 | ±0.75 LSB | 1 | Y | +5V, ±5V | I | 70 mW | AC tested | CERDIP-28 |
| ADC12451 | Byte-wide | 12 + sign | 7.95 | ±0.5 LSB | 1 | Y | +5V, ±5V | I | 113 mW | AC tested | CERDIP-24 |
| ADC1251 | Byte-wide | 12 + sign | 7.95 | ±1 LSB | 1 | Y | +5V, ±5V | I | 113 mW | Self calibrating | CERDIP-24 |
| ADC12H030 | Serial | 12 + sign | 5.5 | ±1 LSB | 2 | Y | +5V | I | 36 mW | Software power-down to 100 μW | SOIC-16 |
| ADC12H032 | Serial | 12 + sign | 5.5 | ±1 LSB | 2 | Y | +5V | I | 36 mW | Software power-down to 100 μW | SOIC-20 |
| ADC12H034 | Serial | 12 + sign | 5.5 | ±1 LSB | 4 | Y | +5V | I | 36 mW | Software power-down to 100 μW | SOIC-24, SSOP-24 |
| ADC12H038 | Serial | 12 + sign | 5.5 | ±1 LSB | 8 | Y | +5V | I | 36 mW | Software power-down to 100 μW | SOIC-28 |
| ADC12L030 | Serial | 12 + sign | 8.8 | ±1 LSB | 2 | Y | +3.3V | I | 15 mW | 3V guaranteed operation | SOIC-16 |
| ADC12L032 | Serial | 12 + sign | 8.8 | ±1 LSB | 2 | Y | +3.3V | I | 15 mW | 3V guaranteed operation | SOIC-20 |
| ADC12L034 | Serial | 12 + sign | 8.8 | ±1 LSB | 4 | Y | +3.3V | I | 15 mW | 3V guaranteed operation | SOIC-24 |
| ADC12L038 | Serial | 12 + sign | 8.8 | ±1 LSB | 8 | Y | +3.3V | I | 15 mW | 3V guaranteed operation | SOIC-28 |
| ADC78H89 | Serial | 12 | 2 | ±1 LSB | 7 | Y | +3V to +5V | I | 1.5 mW | 500 kSPS, SPI interface, separate digital supply | TSSOP-16, Eval. |
| ADC78H90 | Serial | 12 | 2 | ±1 LSB | 8 | Y | +3V to +5V | I | 1.5 mW | 500 kSPS, SPI interface, separate digital supply | TSSOP-16, Eval. |
| ADC7476 | Serial | 12 | 1 | ±0.4 LSB | 1 | Y | +3V to +5V | I | 4.8 mW | 1 MSPS, SPI interface | SOT23-6, Eval. |
| LM12454 | Parallel | 12 + sign | 8.8 | ±1 LSB | 4 | Y | +5V | I | 30 mW | On-board timer, FIFO, sequencer | PLCC-44 |
| LM12458 | Parallel | 12 + sign | 8.8 | ±1 LSB | 8 | Y | +5V | I | 30 mW | On-board timer, FIFO, sequencer | PLCC-44, PQFP-44 |
| LM12H458 | Parallel | 12 + sign | 5.5 | ±1 LSB | 8 | Y | +5V | I | 34 mW | On-board timer, FIFO, sequencer | PLCC-44, PQFP-44 |
| LM12L458 | Parallel | 12 + sign | 7.3 | ±1 LSB | 8 | Y | +3.3V | I | 15 mW | 3V version of LM12458 | PLCC-44 |
| LM331 | Frequency | V-F | N/A | 0.01% | 1 | N | +5V to +40V | C | 30 mW | V to F converter, 100 kHz max | MDIP-8 |

Temperatures
 C = 0°C to +70°C
 I = -25°C to +85°C or -40°C to +85°C
 M = -55°C to +125°C