Industrial Applications
Signal Chains

PLC Outputs (AD5754R, ADR02, AD8655, ADuM1300)

Non-Invasive Flow Monitor (AD8603, AD8137, AD8310, AD7942)

Motor Control (AD2S1200, AD7400, ADuM1300, ADuC7128)
Converting: ADCs

AD7400 Isolated Sigma-Delta Modulator

Key Features
- 10 MHz data rate
- 2nd-order modulator
- ±4 LSB INL with 16-bit resolution
- Onboard digital isolator and reference
- ±200 mV Ain range
- Low power operation: 15 mA max
- -40°C to +105°C operating temperature range

Benefits
- Highest performance isolated ADC
  - ± 2 LSB INL typical with 16-bit resolution
  - 5mV/°C offset drift
- 2nd order modulator
  - 10 MHz data rate - AD7400
  - 16 MHz data rate - AD7401

Key Applications
- AC motor control
- Data acquisition systems
- A/D and opto-isolator replacements

Cost
$4.00 per unit in 1k quantity

Package Options
- 16-lead SOIC

Recommended Complementary Products
- ADA4851-1: low cost, high-speed rail-to-rail output operational amplifier
- AD8051: low cost, high speed, single, rail-to-rail amplifier
- AD5543: 16-bit DAC in µSOIC-8 package
- AD5545: precision dual 16-bit and 14-bit DACs in compact TSSOP packages

Product Link
www.analog.com/AD7400
Converters: DACs

AD5754R Complete, Quad, 16-Bit, Serial Input, Unipolar/Bipolar Voltage Output DAC

Key Features
- Complete quad 16-bit D/A converter
- Operates from single/dual supplies
  - +4.5 V to ±16.5 V
- Software-programmable output range:
  - +5 V, +10 V, +10.8 V, ±5 V, ±10 V, over-range
- ±8 LSB max INL error, ±1 LSB max DNL error
- Total unadjusted error (TUE) 0.1% FSR max
- Settling time: 10 µs max
- Integrated reference, 5 ppm/°C
- Integrated reference buffers
- Output control during power-up/brownout
- Simultaneous updating via LDAC
- Asynchronous CLR to zero-/mid-scale
- DSP/microcontroller compatible serial interface
- Operating temperature range: -40°C to +85°C
- CMOS™ process technology

Benefits
- The combination of small package, programmable voltage output ranges and operation over a wide range of dual and single supplies make the AD5754R and family ideal for analog output requirements for PLC modules, DAQ cards and DC set point control in space-constrained industrial and instrumentation applications

Key Applications
- Programmable logic controllers
- Closed-loop servo control, process control
- Automatic test equipment
- DC set-point control

Cost
$10.05 per unit in 1k quantity
Converters: DACs

AD7942 14-Bit, 250 kSPS PulSAR® ADC

Key Features
- 14-bit resolution, no missing codes
- 250 kSPS sampling rate
- INL 1 LSB MAX
- SINAD 85 dB @ 20k
- 10-lead MSOP
- 1.15 mW @ 100k
- Power dissipation:
  - 1.15 mW @ 2.5V/100 kSPS
  - 1.15 µW @ 2.5 V/100 SPS
- Pseudo-differential analog input range:
  - 0 V to V_REF with V_REF up to V_DD
- Single supply operation 2.3 V to 5.5 V with 1.8 V to 5 V logic interface
- No pipeline delay
- Multiple ADCs daisy chain, busy indicator
- Serial interface SPI®/QSPI™/DSP-compatible
- Pin-to-pin compatible with the 16-bit AD7685

Benefits
- Small package
- Low power
- Ideal 14-bit accuracy
- Daisy-chaining

Key Applications
- Data acquisition
- Industrial
- Medical
- Battery-powered applications
- Process control

Cost
$4.75 per unit in 1k quantity

Packages Options
- 10-lead MSOP

Related Devices

<table>
<thead>
<tr>
<th>Type</th>
<th>100 kSPS</th>
<th>250 kSPS</th>
<th>500 kSPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Bit True Differential</td>
<td>AD7684</td>
<td>AD7687</td>
<td>AD7688</td>
</tr>
<tr>
<td>16-Bit Pseudo Differential/Unipolar</td>
<td>AD7683</td>
<td>AD7685</td>
<td>AD7686</td>
</tr>
<tr>
<td>16-Bit Unipolar</td>
<td>AD7680</td>
<td>AD7942</td>
<td>AD7946</td>
</tr>
<tr>
<td>14-Bit Pseudo Differential/Unipolar</td>
<td>AD7686</td>
<td>AD7694</td>
<td></td>
</tr>
<tr>
<td>14-Bit Unipolar</td>
<td>AD7940</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Product Link
www.analog.com/AD7942
**Processors: Precision Analog Microcontroller**

**ADuC7128 Precision Analog Microcontroller ARM7TDMI® MCU with 12-Bit ADC and DDS DAC**

**Key Features**

**Common Architectural Features**
- Analog I/O multi-channel, 12-bit, 1MSPS ADC
  - 10 ADC channels-32-bit 21 MHz DDS
  - Current-to-voltage (I/V) conversion
  - Integrated 2nd order LPF
  - DDS input to DAC
  - 100 Ohm line driver, on-chip voltage reference, on-chip temperature sensor (±3°C)
  - Uncommitted voltage comparator

**Microcontroller**
- ARM7TDMI core, 16-/32-bit RISC architecture, JTAG port supports code download and debug, external watch crystal/clock source
- 41.78 MHz PLL with 8 way programmable divider
- Optional trimmed on-chip oscillator

**Memory**
- 126k bytes flash/EE memory, 8k bytes SRAM in-circuit download, JTAG-based debug software triggered in-circuit re-programmability

**On-Chip Peripherals**
- 2 x UART, 2 x I²C® and SPI serial I/O 28-pin GPIO port, 5x general purpose timers wake-up and watchdog timers, power supply monitor 16-bit PWM generator, quadrature encoder PLA - programmable logic

**Benefits**
- The peripherals include 6-channel pulse-width modulation (PWM) with H-bridge mode, an on-chip quadrature encoder that deliver the speed, position and direction control required by dc motor controls, and an integrated direct digital synthesizer (DDS) and low-pass filter that generates a raw sine wave at up to 1 MHz to act as a stimulus for smart sensing applications.
- In addition to the 6-channel PWM and quadrature encoder, the ADuC7128 provides I/V control, making it applicable to a variety of motor control applications. The PWMs can also be used as general purpose 16-bit PWMs to provide additional DAC outputs, high frequency clocks or set point control

**Key Applications**
- Motor control
- Smart sensing applications

**Cost**
- $6.95 per unit in 1k quantity

**Package Options**
- 64-lead LF CSP (9mm x 9mm) package

**Recommended Complementary Products**
- AD8354: 1 MHz - 2.7 GHz RF gain blocks, silicon bipolar amplifier

**Product Link**
- www.analog.com/ADuC7128

For other members of analog microcontrollers please visit: www.analog.com/microcontroller
Converters: Synchro/Resolver to Digital Converters

AD2S1200 12-Bit R/D Converter with Reference Oscillator

Key Features
- Complete monolithic R/D converter
- Parallel and serial 12-bit data ports
- System fault detection
- Absolute position and velocity outputs
- Differential inputs
- ±11 arc minutes of accuracy
- 1,000 rps maximum tracking rate, 12-bit resolution
- Incremental encoder emulation: 1,024 pulses/rev
- Programmable sinusoidal oscillator on-board
- Compatible with DSP and SPI® interface standards
- 204.8 kHz square wave output
- Single-supply operation: 5.00 V ± 5%

Benefits
- Complete resolver to digital solution
- Wide choice of data format
  - parallel, serial and encoder emulation
- Angular position and angular velocity available
- Programmable excitation frequency
- System fault detection
- High accuracy

Key Applications
- Hybrid electric vehicles
- Electric power steering
- Integrated starter generator/alternator
- Encoder emulation
- Automotive motion sensing and control

Cost
$12.00 per unit in 1k quantity

Package Options
- 44-lead LFQP

Related Devices

<table>
<thead>
<tr>
<th>Device No</th>
<th>Resolution (Bits)</th>
<th>Max track rate (srps)</th>
<th>Accuracy (arcmin)</th>
<th>Ref Freq (Hz)</th>
<th>Encoder Emulation</th>
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<tbody>
<tr>
<td>AD2S1205</td>
<td>12</td>
<td>1250</td>
<td>11</td>
<td>10k-20k</td>
<td>Yes</td>
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<tr>
<td>AD2S1210</td>
<td>10/12/14/16</td>
<td>2500/1000/500/125</td>
<td>5 + 1 lsb</td>
<td>2k-20k</td>
<td>Yes</td>
</tr>
<tr>
<td>AD2S80A</td>
<td>10/12/14/16</td>
<td>1040/260/65/16.25</td>
<td>8/4/2 + 1 lsb</td>
<td>50-20k</td>
<td>No</td>
</tr>
<tr>
<td>AD2S90</td>
<td>12</td>
<td>500</td>
<td>10.6 + 1 lsb</td>
<td>3k-20k</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Product Link
www.analog.com/AD2S1200
Coupler® Digital Isolators

ADuM130x Triple-Channel Digital Isolator

Key Features
• 3 isolated channels in one package
• < 20mW power at < 2 Mbps data rates
• Up to 90 Mbps data rate
• 105°C operation
• UL, VDE, CSA and TUV safety approvals
• Multidirectional channels available
• < 2nS channel-to-channel matching
• > 25kV/µs transient immunity
• Digital interface
• Default high output (default low output available as ADuM131x)

Benefits
• Lowest system cost
• Most compact solution
• Highest reliability at high operating temperatures
• Easiest isolation to implement for fastest time-to-market

Key Applications
• Motor drives
• SPI interfaces
• Industrial field buses

Cost
$1.61 per unit in 1k quantity

Package Options
• 16-lead wide body SOIC

Product Link
www.analog.com/ADuM130x
Amplifiers: Logarithmic Amplifier

AD8310 Fast, Voltage-Out DC -440 MHz, 95 dB Logarithmic Amplifier

Key Features
- DC -440 MHz operation, ±0.4 dB linearity
- Voltage output, rise time <15 ns
- High current capacity: 25 mA into grounded RL
- 95 dB dynamic range: -91 dBV to +4 dBV
- Single supply of 2.7 V min at 8 mA typ
- Slope of +24 mV/dB, intercept of -108 dBV
- 100 ns power-up time, 1 mA sleep current

Benefits
- Low cost and small package size
- Fast response time of <15 ns
- Fully differential dc-coupled signal path
- Highly stable scaling over temperature

Key Applications
- Conversion of signal level to decibel form
- Signal-level determination down to 20 Hz
- Transmitter antenna power measurement
- Receiver signal strength indication (RSSI)
- Low cost radar and sonar signal processing
- Network and spectrum analyzers
- True-decibel ac mode for multimeters

Cost
- $3.95 per unit in 1k quantity

Package Options
- 8-lead MSOP

Product Link
www.analog.com/AD8310
Amplifiers: Precision Operational Amplifiers

AD8655 Low Noise, Precision CMOS Amplifier

Key Features
- Low noise: 2.7 nV/√Hz @ f = 10 kHz
- Low distortion: 0.0008%
- Low offset voltage: 250 µV max
- Bandwidth: 28 MHz
- Rail-to-rail input/output
- 2.7 V to 5.5 V operation
- –40°C to +125°C operation

Benefits
- Rail-to-rail at the input and output enables designers to buffer ADCs and other wide output swing devices in single-supply systems
- ADI’s patented DigiTrim® technology to achieve high DC accuracy
- Suitable for industrial instrumentation applications where noise and DC performance are critical

Key Applications
- Industrial controls
- Precision filters
- Digital scales
- Strain gauges
- Audio

Cost
$0.70 per unit in 1k quantity

Package Options
- 8-lead MSOP and SOIC

Related Devices

<table>
<thead>
<tr>
<th>Part #</th>
<th>VSR</th>
<th>VR max</th>
<th>GBP</th>
<th>Slew Rate</th>
<th>IR max</th>
<th>en @ 1 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singles</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AD8651</td>
<td>2.7 to 5.5 V</td>
<td>350 µV</td>
<td>50 MHz</td>
<td>41 V/µs</td>
<td>14 mA</td>
<td>8 nV/√Hz</td>
</tr>
<tr>
<td>AD8691</td>
<td>2.7 to 6 V</td>
<td>2 mV</td>
<td>10 MHz</td>
<td>5 V/µs</td>
<td>1.05 mA</td>
<td>12 nV/√Hz</td>
</tr>
<tr>
<td>AD8628</td>
<td>2.7 to 6 V</td>
<td>5 µV</td>
<td>2.5 MHz</td>
<td>1 V/µs</td>
<td>1.1 mA</td>
<td>22 nV/√Hz</td>
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<tr>
<td>AD8603</td>
<td>1.8 to 6 V</td>
<td>50 µV</td>
<td>0.4 MHz</td>
<td>0.1 V/µs</td>
<td>50 µA</td>
<td>25 nV/√Hz</td>
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<tr>
<td>Duals</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AD8672</td>
<td>8 to 36 V</td>
<td>75 µV</td>
<td>10 MHz</td>
<td>4 V/µs</td>
<td>3.5 mA</td>
<td>3.8 nV/√Hz</td>
</tr>
<tr>
<td>AD8662</td>
<td>5 to 16 V</td>
<td>100 µV</td>
<td>4 MHz</td>
<td>3.5 V/µs</td>
<td>2 mA</td>
<td>12 nV/√Hz</td>
</tr>
</tbody>
</table>

Product Link
www.analog.com/AD8655
Amplifiers: Precision Operational Amplifiers

AD8603 Precision Micropower Low Noise CMOS Operational Amplifier

Key Features
- Low offset voltage: 50 µV max
- Low input bias current: 1 pA max
- Single-supply operation: 1.8 V to 5 V
- Low noise: 22 nV/Hz
- Micropower: 50 µA max

Benefits
- Tiny packaging for small form factor applications
- Low power DC accuracy and low noise combination excellent for portable medical and instrumentation applications
- Rail-to-rail input and output to operate close to 1.8 V and 6 V for wide dynamic range beneficial for shunt sense, voltage monitoring, ADC driving, low power microcontroller analog input

Key Applications
- Battery-powered instrumentation
- Filters
- Sensors gain stages: thermocouple, pressure
- Low power ASIC or microcontroller and ADC drivers

Cost
$0.67 per unit in 1k quantity

Package Options
- 5-lead TSOT-23

Related Devices

<table>
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<tr>
<th>Part #</th>
<th>$V_{in}$</th>
<th>$V_{os}$ max</th>
<th>GBP</th>
<th>Slew Rate</th>
<th>$I_{in}$ max</th>
<th>$en @ 1 kHz$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singles</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AD8615</td>
<td>2.7 to 6 V</td>
<td>300 µV</td>
<td>24 MHz</td>
<td>12 V/µs</td>
<td>2 mA</td>
<td>8 nV/sqrt(Hz)</td>
</tr>
<tr>
<td>OP196</td>
<td>3 to 12 V</td>
<td>300 µV</td>
<td>0.45 MHz</td>
<td>0.3 V/µs</td>
<td>60 µA</td>
<td>26 nV/sqrt(Hz)</td>
</tr>
<tr>
<td>AD8502</td>
<td>1.8 to 5.5 V</td>
<td>3 mV</td>
<td>7 kHz</td>
<td>0.004 V/µs</td>
<td>1 µA</td>
<td>190 nV/sqrt(Hz)</td>
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<tr>
<td>AD8613</td>
<td>1.8 to 5.5 V</td>
<td>2.2 mV</td>
<td>0.4 MHz</td>
<td>0.1 V/µs</td>
<td>41 µA</td>
<td>25 nV/sqrt(Hz)</td>
</tr>
<tr>
<td>Duals</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AD8607</td>
<td>1.8 to 6 V</td>
<td>50 µV</td>
<td>0.4 MHz</td>
<td>0.1 V/µs</td>
<td>50 µA</td>
<td>25 nV/sqrt(Hz)</td>
</tr>
<tr>
<td>AD8667</td>
<td>5 to 16 V</td>
<td>100 µV</td>
<td>550 kHz</td>
<td>0.2 V/µs</td>
<td>250 µA</td>
<td>35 nV/sqrt(Hz)</td>
</tr>
</tbody>
</table>

Product Link
www.analog.com/AD8603

![AD8603 Schematic]
Differential ADC Driver

AD8137 Low Cost, Low Power 12-Bit Differential ADC Driver

Key Features
- Extremely low power
  - 2.6 mA @ 5 V
  - 450 µA in power-down mode @ 5 V
- High speed
  - 110 MHz, -3 dB bandwidth (G = +1)
  - 450 V/µs slew rate
- 12-bit distortion @ 500 kHz
- Fast settling time: 100 ns to 0.02%
- Low voltage offset: ± 2.6 mV max
- Rail-to-rail output
- Fully differential
  - Single-ended-to-differential operation
  - Differential-to-differential operation
- Adjustable output common mode voltage
- Externally adjustable gain
- Wide supply voltage range
  - 2.7 V to 12 V

Benefits
- The AD8137 is a low power, low cost, high-speed differential amplifier for 12-bit data acquisition systems and other systems that are sensitive to power and cost.
- Adjustable output common mode voltage allows the user to easily level shift signals.

Key Applications
- Battery-powered applications
- Portable instrumentation
- Single-ended-to-differential converters
- Differential active filters
- Level shifter

Cost
- $1.09 per unit in 1k quantity

Package Options
- 8-lead SOIC
- 8-lead 3mm x 3mm LFCSP

Recommended Complementary Products
- Precision ADCs
- Precision DACs

Related Devices
- AD8132: low cost, high speed differential amplifier
- AD8138: low distortion differential ADC driver
- AD8139: ultra low noise fully differential ADC driver

Product Link
- www.analog.com/AD8137
ADR02 Ultra Compact Precision 5 V Reference

Key Features
- 5 V output
- Ultra compact SC70-5 and TSOT-5 packages
- Initial accuracy ± .1%
- Low noise 10 µV p-p (0.1 Hz to 10 Hz)
- Wide operating range 7.0-40 V
- High output current 10 mA

Benefits
- High initial accuracy and low drift makes this device ideally suited for precision measurement systems
- Excellent long term drift and hysteresis characteristics minimize the number of calibration cycles required, reducing maintenance and service costs
- No external capacitors required thus precious PCB space is preserved
- Low noise characteristics improve system accuracy

Key Applications
- Precision data acquisition systems
- High resolution converters
- Industrial process controls
- Precision instruments
- Automotive

Cost
$1.10 per unit in 1k quantity
Industrial Applications Product Selection Table

<table>
<thead>
<tr>
<th>Amplifiers</th>
<th>Bandwidth</th>
<th>Supply</th>
<th>Package</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD8603</td>
<td>400 kHz</td>
<td>1.8 V to 6 V</td>
<td>TSOT</td>
<td>low bias current (0.2 pA), rail-to-rail input/output op amp</td>
</tr>
<tr>
<td>AD8655</td>
<td>28 MHz</td>
<td>2.7 V to 5.5 V</td>
<td>SOIC, MSOP</td>
<td>low noise (4nV/√Hz), rail-to-rail input/output op amp</td>
</tr>
<tr>
<td>AD8310</td>
<td>DC to 440 MHz</td>
<td>2.7 V to 5.5 V</td>
<td>SOIC</td>
<td>log amplifier with 100 dB dynamic range and 15 nS response time</td>
</tr>
<tr>
<td>AD8137</td>
<td>110 MHz</td>
<td>2.7 V to ±6 V</td>
<td>SOIC</td>
<td>low power, 12-bit differential ADC driver with rail-to-rail output</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Converters</th>
<th>Type</th>
<th>Resolution</th>
<th>Interface</th>
<th>Supply</th>
<th>Package</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD7942</td>
<td>ADC</td>
<td>14 bits</td>
<td>SPI</td>
<td>2.5 V to 5 V</td>
<td>CSP, SOP</td>
<td>250 kSPS ADC with no pipeline delay</td>
</tr>
<tr>
<td>AD2S1200</td>
<td>Resolver to Digital</td>
<td>12 bits</td>
<td>Parallel, Serial</td>
<td>5 V</td>
<td>LQFP</td>
<td>11 arc minutes of accuracy</td>
</tr>
<tr>
<td>AD5754R</td>
<td>DAC</td>
<td>16 bits</td>
<td>SPI</td>
<td>4.5 V to ±16 V</td>
<td>TSSOP</td>
<td>quad DAC with programmable output ranges</td>
</tr>
<tr>
<td>AD7400</td>
<td>Iso. ΣΔ Modulator</td>
<td>16 bits</td>
<td>Serial</td>
<td>Multi +3 and +5</td>
<td>SOIC</td>
<td>2nd order ΣΔ modulator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Devices in this Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADuM1300 Digital Isolator</td>
</tr>
<tr>
<td>ADR02 Voltage Reference</td>
</tr>
<tr>
<td>ADuC7128 Analog Microcontroller</td>
</tr>
</tbody>
</table>

Ask your distributor sales representative to provide information on these complementary “analog is everywhere” promotions:

Medical Applications

- AD5259: nonvolatile, I²C-compatible 256-position digital potentiometer
- AD7266: differential input, dual 2 MSPS, 12-bit, 3-channel SAR ADC
- AD7142: programmable capacitance-to-digital converter with environmental compensation
- AD7685: 250 kSPS 16-bit PuSAR® ADC
- ADuC7026: precision analog microcontroller
- AD8666: 16 V, 4 MHz rail-to-rail output amplifier
- AD8333: DC to 50 MHz, dual I/Q demodulator and phase shifter
- AD8334: quad VGA with ultralow noise preamplifier and programmable RIN
- AD8220: rail-to-rail output JFET input instrumentation amplifier
- SSM2211: low distortion, 1.5 W audio power amplifier
- ADSP-21375: high-performance 32-bit floating-point SHARC processor

Security and Surveillance Applications

- AD5233: nonvolatile, quad, 64-position digital potentiometer
- AD8668: 16 V, 4 MHz rail-to-rail output amplifier
- AD7276: 3 MSPS, 12-bit ADC
- ADR125: precision micropower LDO voltage reference
- ADG721: CMOS Low Voltage 4 Ω Dual SPST Switch
- ADA4851-1: low cost, high-speed rail-to-rail output operational amplifier
- AD8131: low cost, high speed differential driver
- AD8130: low cost 270 MHz differential receiver amplifier
- AD8113: audio/video 60 MHz 16 x 16 crosspoint switch
- ADV212: JPEG 2000 video codec
- ADSP-BF548: high performance convergent Blackfin® processor
Analog Devices Line Card

**Amplifiers and Comparators**
- Audio Amplifiers
- Buffer Amplifiers
- Comparators
- Current Sense Amplifiers
- Differential Amplifiers
- Gain Blocks
- Instrumentation Amplifiers
- Isolation Amplifiers
- Log Amps/Detectors
- Operational Amplifiers (Op Amps)
- Variable Gain Amplifiers

**Analog-to-Digital Converters**
- A/D Converters
- Audio A/D Converters
- Capacitance-to-Digital Converters
- Energy Measurement
- Isolated A/D Converters
- Synchro/Resolver-to-Digital Converters
- Temperature-to-Digital Converters
- Touchscreen Controllers
- Video Decoders
- Voltage-to-Frequency Converters

**Digital-to-Analog Converters**
- D/A Converters
- Audio D/A Converters
- Digital Potentiometers
- Video Encoders

**Embedded Processing and DSP**
- Blackfin® Processors
- TigerSHARC® Processors
- SHARC® Processors
- ADSP-21xx Processors
- Development Tools

**MEMS and Sensors**
- MEMS® Accelerometers
- MEMS Gyroscopes
- Analog/Digital Temperature Sensors

**RF/IF Components**
- Direct Digital Synthesis (DDS)
- Gain Blocks
- Log Amps/Detectors
- Mixers/Multipliers
- Modulators/Demodulators
- PLL Synthesizers/VCOs
- RF/IF Transceivers
- RF Switches
- RMS Detectors
- Rx/Tx Subsystems
- Short Range Transceivers
- DDS Modulators
- Digital Up-/Downconverters

**Switches/Multiplexers**
- Analog Crosspoint Switches
- Analog Switches
- Digital Crosspoint Switches
- Digital Switches
- Multiplexers (Muxes)
- RF Switches

**Analog Microcontrollers**

**Interface**
- Isolators
- Level Translators
- RS-232
- RS-485
- Transceivers

**Power and Thermal Management**
- Analog/Digital Temperature Sensors
- Battery Chargers
- Charge Pumps
- Fan Controllers
- Hot Swap Controllers
- LED Drivers
- Linear Regulators
- MOSFET Drivers
- Multifunctional Power ICs
- Power Supply Controllers
- Power Supply Sequencers
- Supervisory
- Switching Controllers
- Switching Regulators
- System Monitoring Products
- Temperature Setpoint Controllers

**References**
- Voltage References

**Clock and Timing**
- Clock Generation and Distribution
- PLL Synthesizers/VCOs
- Clock and Data Recovery/Retiming

**Wireless Products**
- Baseband Processing
- Cellular Terminal Chipsets
- DDS Modulators
- Digital Up-/Downconverters

**Other Linear**
- Analog Multipliers/Dividers
- Hall Effect Sensors
- LVDT Sensor Amplifiers
- Matched Transistors
- RMS-to-DC Converters
- Sample/Track-and-Hold Amplifiers

**Audio/Video Products**
- Audio A/D Converters
- Audio Amplifiers
- Audio Codecs
- Audio D/A Converters
- Audio Signal Processors
- Camera/Camcorder Analog Front Ends
- Display Interfaces
- Display Driver Electronics
- Lens Driver Components
- Sample Rate Converters
- Video Codecs
- Video Compression
- Video Encoders
- Video Decoders
- Video Filters

**Broadband Products**
- Broadband Amplifiers
- Broadband Codecs
- DSL/ADSL Chipsets
- CATV Amps/Splitters
- Clock and Data Recovery/Retiming
- Digital Crosspoint Switches

**Fiber/Optic**
- Clock and Data Recovery/Retiming
- Laser Drivers
- Log/Limiting Amplifiers
- Transimpedance Amplifiers

**Other**
- Automatic Test Equipment
- IOS Subsystems
- Military/Aerospace
- Modems
- Multichip