

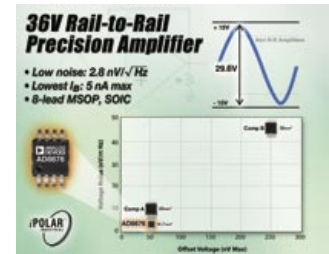


Amplifiers

Analog Devices offers a wide portfolio of amplifier products including high precision operational amplifiers as well as differential amplifiers.

The AD8676 offers offset accuracy-over-temperature, low noise, rail-to-rail outputs, and 10 MHz gain bandwidth. It is ideal for applications that require low noise, DC precision, maximized SNR, and dynamic range. It is specified to operate from $\pm 5V$ to $\pm 15V$ and $-40^{\circ}C$ to $+125^{\circ}C$ and is available in 8-lead MSOP and narrow SOIC lead-free packages.

The ADA4937-1 and ADA4938-1 set new performance standards in noise and distortion for differential ADC drivers. These devices enable design engineers to get the most out of their high performance ADCs with resolutions up to 16 bits from DC–100 MHz. The adjustable level of the output common mode allows the ADA4937-1 and ADA4938-1 to match the input of the ADC. The ADA4937-1 works on a 3V to 5V supply range. It is specified to operate over the temperature range of $-40^{\circ}C$ to $+105^{\circ}C$. The ADA4938-1 works on a 5V to 10V supply range and is specified to operate over the industrial temperature range of $-40^{\circ}C$ to $+85^{\circ}C$.



AD8676 rail-to-rail op amp improves dynamic range for 16-bit and higher data conversion

Features ▶

AD8676

- $\pm 2.5V$ to $\pm 15V$ operation
- Low noise: 2.8 nV/√Hz
- Low offset voltage and offset voltage drift: 50 μV max., 0.6 $\mu V/^{\circ}C$ max.
- High CMRR/PSSR: 130 dB/120 dB
- Rail-rail outputs: ± 350 mV max. from $\pm 15V$ supply rails at 2 Kohm loads

ADA4937/8

- Very low distortion
- Adjustable output common mode

Benefits ▶

AD8676

- High DC accuracy for signal-conditioning applications
- Excellent accuracy over wide temperature range: $-40^{\circ}C$ to $+125^{\circ}C$
- Low-noise performance for tight data acquisition error budgets
- Two options to match performance vs. price needs
- High-voltage device in small packaging: MSOP

ADA4937/8

- Very low noise and distortion optimizes system performance
- Eases design by enabling matching of amplifier to the ADC input range

Applications ▶

AD8676

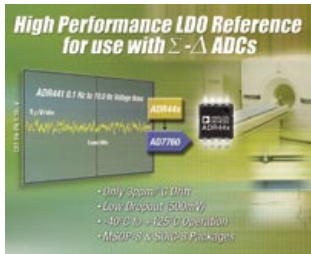
- Precision instrumentation
- PLL filters
- Thermocouple amplifiers
- Strain-gage amplifiers
- Medical instrumentation

ADA4937/8

- ADC drivers
- Single-ended to differential converters
- IF and baseband gain blocks
- Differential buffers
- Line drivers

Product Specifications ▶

Part Number	Voltage Offset Max. (μV)	Offset Drift Over Temperature Max. $\mu V/^{\circ}C$	Voltage Noise @ 1 kHz (Hz)	Slew Rate (V/ μs)	Gain Bandwidth (MHz)	Supply Current (mA)	Output Drive (mA)	Packaging	In/Out
AD8676A	100	0.6	2.8 nV/sqrt	2.5	10	2.7	20	SOIC, MSOP	Rail-rail output
AD8676B	50	0.6	2.8 nV/sqrt	2.5	10	2.7	20	SOIC, MSOP	Rail-rail output
Part Number	Disable	Supply Voltage (V)	BW@ACL (MHz)	Slew Rate (V/ μs)	Distortion SFDR @BW (dBc)	Noise (nV/√Hz)	Temperature Range	Package	
ADA4937-1	Yes	3–5	1900	6000	-102@10 MHz	2.2	Industrial	3 mm x 3 mm LFCSF	
ADA4938-1	Yes	5 – ± 5	1500	4700	-102@10 MHz	2.2	Industrial	3 mm x 3 mm LFCSF	



Low 1/f noise (0.1 Hz to 10 Hz);
as low as 1.0 $\mu\text{V}_{\text{p-p}}$

Peripherals for Industrial Applications

Analog Devices' ADG14xx Series features ultra-low, on-resistance switches and multiplexers. These parts feature best-in-class on-resistance flatness across the signal range, which includes both rails. The parts are fully-specified for $\pm 15\text{V}$, $+12\text{V}$, and $\pm 5\text{V}$ operation.

The ADR42x/43x/44x are a series of XFET™ voltage references featuring low-noise, high-accuracy, and low-temperature drift performance. Using ADI's patented temperature drift curvature correction and XFET (extra implanted junction FET) technology, the ADR42x/43x/44x's voltage change versus temperature nonlinearity is minimized. The XFET references operate at lower currents and supply more headroom than buried zener references.

Features ▶

ADG14xx

- Low $\pm 15\text{V}$ on-resistance
- 2 Ω max. on-resistance for switches; 4.7 Ω for multiplexers
- 0.5 Ω max. on-resistance flatness
- Fully-specified at $\pm 15\text{V}$, $+12\text{V}$, and $\pm 5\text{V}$
- Rail-to-rail operation

ADR42x/3x/4x

- Low noise (0.1 Hz to 10 Hz); as low as 1.0 $\mu\text{V}_{\text{p-p}}$ @2.048V
- Low temperature coefficient: 3 ppm/°C
- High initial accuracy: 0.05 percent
- High output current drive; up to 10 mA source/10 mA sink
- Wide operating range: 2.5V to 18V

Benefits ▶

ADG14xx

- Improved system linearity performance
- Improved system distortion performance
- Ability to switch rail-to-rail signals
- Space-saving smaller packages
- Allows replacement of relays when multiplexing low-value resistances

ADR42x/3x/4x

- Higher overall system accuracy
- Improved signal-to-noise ratio
- Reduces system calibration complexity
- Versatility as an LDO regulator and a voltage reference with multiple ADCs/DACs
- Any voltage less than 18V can supply the reference

Applications ▶

ADG14xx

- Data acquisition systems
- Industrial process control systems
- Medical instrumentation
- Precision instruments
- Relay replacement

ADR42x/3x/4x

- Battery-powered instrumentation
- Industrial process control systems
- Medical instrumentation
- Data acquisition systems
- Optical network control circuits
- Precision instruments

Product Specifications ▶

Part Number	Function	On-Resistance (Ω)	On-Resistance Flatness (Ω)	Packaging
ADG1408	8:1 multiplexer	4	0.5	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1409	Differential 4:1 multiplexer	4	0.5	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1433	3 x SPDT switch	4	0.5	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1434	4 x SPDT switch	4	0.5	TSSOP-20, 4 mm x 4 mm LFCSP-20
ADG1404	4:1 multiplexer	1.5	0.1	TSSOP-14, 4 mm x 4 mm LFCSP-16
ADG1411	4 x SPST switch (NO)	1.5	0.1	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1412	4 x SPST switch (NC)	1.5	0.1	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1413	4 x SPST switch (NO/NC)	1.5	0.1	TSSOP-16, 4 mm x 4 mm LFCSP-16
ADG1436	2 x SPDT switch	1.5	0.1	TSSOP-16, 4 mm x 4 mm LFCSP-16

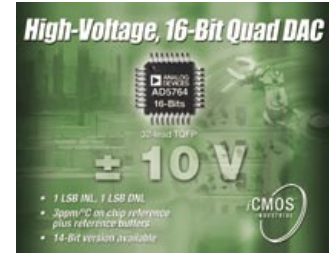
Part Number	Output Voltage (V)	Initial Accuracy (%)	Offset Drift Over Temperature Max. (ppm/°C)	Voltage Noise (0.1 Hz to 10 Hz) ($\mu\text{V}_{\text{p-p}}$)	Supply Current (μA)	Output Current Source (mA)	Output Current Sink (mA)	Packaging
ADR42x	2.048, 2.5, 3.0, 4.096, 5.0	0.05	3	1.75	600	10	NA	SOIC, MSOP
ADR43x	2.048, 2.5, 3.0, 4.096, 5.0	0.05	3	3.5	800	10	10	SOIC, MSOP
ADR44x	2.048, 2.5, 3.0, 4.096, 5.0	0.05	3	1	3700	10	5	SOIC, MSOP



Converters

Analog Devices offers a full series of converters for industrial applications. The AD5764 is a quad, serial-input, bipolar, voltage output DAC that features 16-bit resolution, 1 LSB INL, 1 LSB DNL, and gain-and-offset calibration to less than 1 mV. The device integrates features essential to reducing design time and overall system cost, including reference buffers, a low headroom/wide swing amplifier, a temperature sensor, power-on reset, power on/off output control, and I/O lines. This integrated functionality is housed in a 7 mm x 7 mm 32-lead TQFP package.

The AD7328 is a true bipolar-input iCMOS multichannel ADC with high impedance inputs and software-programmable analog input (AIN) ranges from $\pm 2.5V$ to $\pm 10V$. These AIN ranges can be configured as single-ended, fully-differential, or pseudo-differential. Dedicated control register bits are used to configure the analog inputs. The ADCs contain a channel sequence, allowing automatic conversions on a group of preprogrammed analog input channels.



High-voltage, 16-bit quad DAC

Features ▶

AD5764

- 16-bit resolution and monotonicity
- High-accuracy ± 1 LSB INL and DNL
- Low noise: 60 nV/ $\sqrt{\text{Hz}}$
- Output control during power-up/brownout
- Digital offset and gain adjust

AD7328

- 12-bit plus sign SAR ADC
- Low power: 25 mW
- Software-selectable input ranges: $\pm 10V$, $\pm 5V$, $\pm 2.5V$, and $0V$ to $10V$
- 2/4/8 analog input channels with channel sequencer
- Sample rate 500 kSPS to 1 MSPS

Benefits ▶

AD5764

- High accuracy and stability for precision applications
- Large output swings for good noise immunity, and error budgeting and bipolar outputs for control systems
- Asynchronous output control for power up/down or during a fault condition
- Serial SPI interface allows the part to interface to a wide variety of processors

AD7328

- Software-selectable inputs
- True bipolar inputs
- Internal reference
- Serial interface
- Low power, 25 mW

Applications ▶

AD5764

- Industrial automation
- Open/closed-loop servo control
- Data acquisition
- High-accuracy instrumentation
- ATE

AD7328

- Process control
- Factory automation
- Industrial instrumentation
- Motion control

Product Specifications ▶

Digital-to-analog converters	Part Number	Package Description	Interface	Number of Channels	Resolution (Bits)	Accuracy
	AD5764	32-lead TQFP	Serial	4	16	± 1 LSB INL
	AD5744	32-lead TQFP	Serial	4	14	± 1 LSB INL
	AD5725	28-lead SSOP	Parallel	4	12	± 1 LSB INL
	AD5726	16-lead SSOP/SOIC	Serial	4	12	± 1 LSB INL
Analog-to-digital converters	Part Number	Package Description	Temperature Range (°C)	Number of Channels	Throughput Rate	Features
	AD7328	20-lead TSSOP	-40 to +85	8	1 MSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7329	24-lead TSSOP	-40 to +85	8	1 MSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7327	20-lead TSSOP	-40 to +85	8	500 KSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7324	16-lead TSSOP	-40 to +85	4	1 MSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7323	16-lead TSSOP	-40 to +85	4	500 KSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7322	14-lead TSSOP	-40 to +85	2	1 MSPS	± 1 LSB INL; ± 0.9 LSB DNL
	AD7321	14-lead TSSOP	-40 to +85	2	500 KSPS	± 1 LSB INL; ± 0.9 LSB DNL

Arrow Industrial Selector Guide



Blackfin® Processors

Blackfin® processors are ideal for the challenges involved in designing today's embedded systems and industrial applications. They offer a multitude of embedded interfaces, including networking, LCD, flexible bus, ADC, and DAC connectivity. They are part of a new breed of 16/32-bit embedded processors that are well-suited for products requiring a convergence of capabilities, including such applications as multi-format audio, video, voice, and image processing, as well as multi-mode baseband and packet processing, control processing, and real-time security. The Blackfin's unique combination of software flexibility and scalability has gained widespread adoption in these applications.

Features ▶

- Add new capabilities to products by taking advantage of combined control and signal-processing capabilities on a single chip
- Code security and data integrity with Lockbox™ secure technology
- On-chip Flash memory now available with up to 1 MB of storage
- RoHS compliant
- Industrial temperatures available

Benefits ▶

- System designers can specifically tailor the device power consumption profile to end system requirements with Dynamic Power Management (DPM)
- Minimize product development time with an easy-to-use, mixed 16/32-bit instruction-set architecture and development tool suite
- RTOS offerings from leading industrial partners such as: Green Hills Software, Quadros Systems, Express Logic, Micrium µC-OS II, open source uClinux, ADI's VisualDSP++® Kernel (VDK), Uicoi Systems, and Mentor Graphics

Applications ▶

- Industrial control
- Factory automation
- Instrumentation
- Medical
- Voice
- Video security/surveillance
- POS systems

Product Specifications ▶

Part Number	Package Options	Speed Range (MHz)	Memory (RAM kB)	Key Peripherals
ADSP-BF522	MiniBGA	300-600	132	PPI, UART, SPI; 2 SPORTs, NAND interface; TWI, lockbox, host DMA
ADSP-BF525	MiniBGA	300-600	132	PPI, UART, SPI, HS USB OTG; 2 SPORTs, NAND interface; TWI, lockbox, host DMA
ADSP-BF527	MiniBGA	300-600	132	PPI, UART, SPI, HS USB OTG; 2 SPORTs, NAND interface; TWI, lockbox, host DMA, 10/100 Ethernet
ADSP-BF531	PBGA, miniBGA, LQFP	400	52	PPI, UART, SPI; 2 SPORTs; 3 timers, 16 GPIOs
ADSP-BF532	PBGA, miniBGA, LQFP	400	84	PPI, UART, SPI; 2 SPORTs; 3 timers, 16 GPIOs
ADSP-BF533	PBGA, MiniBGA	500-750	148	PPI, UART, SPI; 2 SPORTs; 3 timers, 16 GPIOs
ADSP-BF534	MiniBGA, sparse miniBGA	400-500	132	CAN 2.0B, PPI, SPI, TWI; 8 timers, 48 GPIOs; 2 SPORTs, 2 UARTs
ADSP-BF535	PBGA	200-350	308	2 SPIs; 2 SPORTs; USB device, PCI

Part Number	Package Options	Speed Range (MHz)	Memory (RAM kB)	Key Peripherals
ADSP-BF536	MiniBGA, sparse miniBGA	300-400	100	10/100 Ethernet MAC, CAN 2.0B, PPI; TWI, SPI, 8 timers, 48 GPIOs; 2 SPORTs, 2 UARTs
ADSP-BF537	MiniBGA, sparse miniBGA	500-600	132	10/100 Ethernet MAC, CAN 2.0B, PPI; TWI, SPI, 8 timers, 48 GPIOs; 2 SPORTs, 2 UARTs
ADSP-BF538	MiniBGA	400-500	148; Flash 512 or 1MB	CAN 2.0B, 54 GPIOs; 3 SPIs, 2 TWIs, PPI; 4 SPORTs, 3 UARTs
ADSP-BF542	BGA	400-600	132	CAN 2.0B, pixel compositor, HS USB OTG; TWI, 2 SPIs, host DMA, 3 UARTs, PPI; 8 timers, Lockbox™ secure technology
ADSP-BF544	BGA	400-533	196	CAN 2.0B, pixel compositor, 2 TWIs, 2 SPIs; 3 UARTs, Lockbox™ secure technology; host DMA, 11 timers, PPI, 18/24-bit LCD
ADSP-BF548	BGA	533-600	260	Pixel compositor, HS USB OTG; 2 TWIs, 3 SPIs, 4 UARTs, 8 timers; Lockbox™ secure technology, 18/24-bit LCD
ADSP-BF549	BGA	533	260	Pixel compositor, HS USB OTG, 2 TWIs; 3 SPIs, 4 UARTs, MXVR, CAN 2.0B, 8 timers; Lockbox™ secure technology, 18/24-bit LCD
ADSP-BF561	PBGA, miniBGA	500-600, dual-core	328	2 PPIs, UART, 12 timers, 2 SPORTs

Related Information ▶

The insert-ready, subminiature phyCORE®-BF537 Single Board Computer (SBC) module is at the core of our Rapid Development Kits and is used in all phases of embedded design, from evaluation and prototyping to development and OEM deployment. Save time and money with the phyCORE-BF537—don't spend weeks in specification, parts procurement, complex schematic rendering, and layout of your own microcontroller circuitry, followed by field trials and redesign iterations.

Visit www.arrow.com/adiphytec to purchase discounted kits and to request an onsite demo.

