

Mixed Signal Solutions

Industrial Measurement & Process Control

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1999
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Industrial & Process Control



Medical Instrumentation



Automatic Test Equipment



Handheld Computing



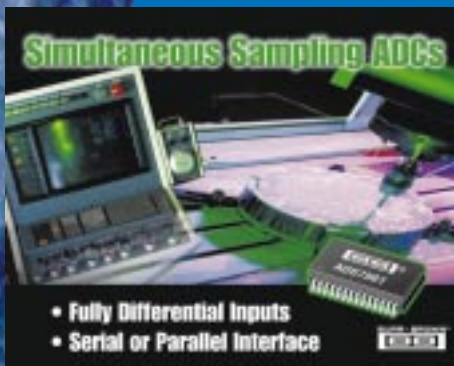
Motor Control



Mixed Signal Solutions

Burr-Brown's expanding product line of complete Industrial A/D and D/A Converters provides Mixed Signal Solutions for Industrial & Process Control, Test & Measurement, Medical Instrumentation, Motor Control, Smart Industrial Transmitters and Portable & Handheld applications.

Precision A/D Converters



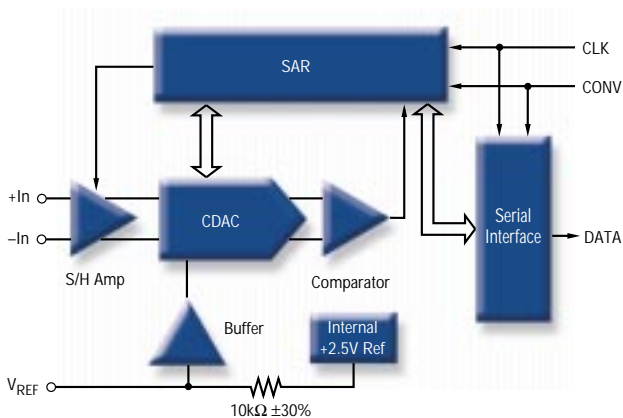
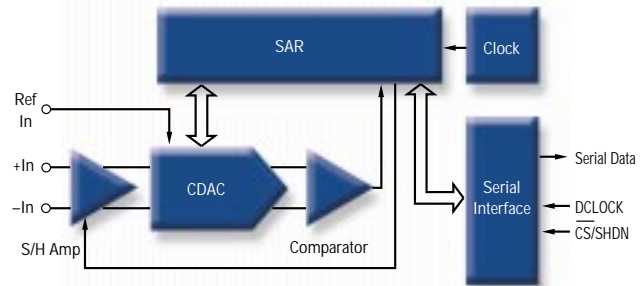
Burr-Brown's Analog-to-Digital (A/D) converter product line offers a broad selection of low-cost, high-precision 12-, 16-, 20-, and 24-bit products for the most challenging mixed-signal industrial applications. Our next generation technology allows the most cost effective solution for your most critical applications.

Products are available utilizing both Successive Approximation and Delta-Sigma architectures. Review the A/D selection guide table to choose the best product for your precision application.

New Product Highlights

Smallest, Low Power, Low Cost 12-Bit A/Ds

ADS7816, ADS7817 and ADS7822, packaged in 8-lead MSOP packages, are the smallest 12-bit A/D converters available. Utilizing innovative design and charge redistribution technology combined with sub-micron processing, results in lower power, smaller size, and lower cost. The newest member of the family, ADS7817, features 4mW power at 200kHz sampling, and has a differential bipolar input range with 80dB CMR. ADS7816, ADS7817, and ADS7822 offer a true power-down and power-up resulting in no waiting prior to acquiring new valid data. Typical applications are battery operated systems, portable instrumentation, and any type of bridge measurement for IPC applications.



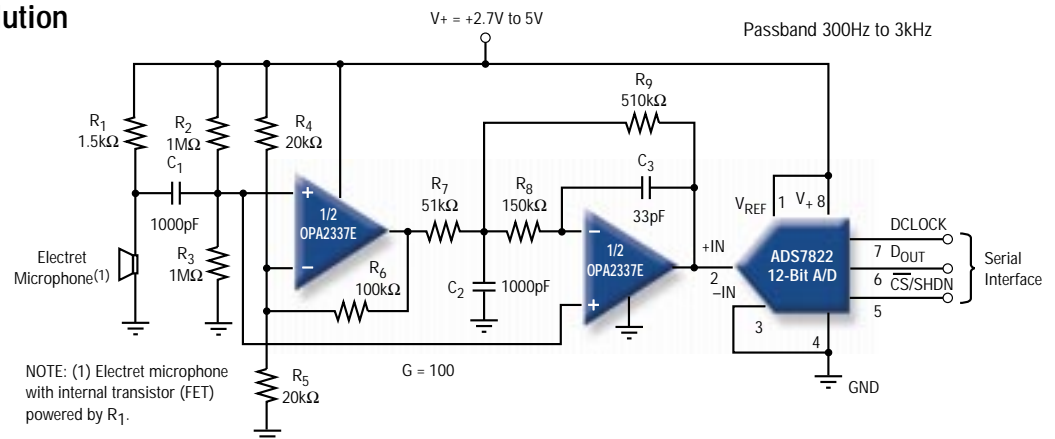
Smallest, High-Speed 12-Bit, 500kHz A/Ds

ADS7818 and ADS7834 are the smallest 12-bit A/D converters with reference on the market, packaged in an 8-lead MSOP. Both ADS7818 and ADS7834 have typical power dissipation of 11mW at a 500kHz throughput rate. In power-down mode, either consumes just 2.5mW, and are complete with sample/hold, internal 2.5V reference and synchronous serial interface. The input range for the ADS7818 is 0 to 5V ($2V_{REF}$) and the ADS7834 is 0 to 2.5V (V_{REF}). Additionally, the serial interface provides low-cost isolation for remote data acquisition. In applications such as AC motor control, brushless DC motor control, any type of bridge measurement for IPC applications, wireless communication systems, and high speed data acquisition, nothing beats the ADS7818 and ADS7834 in size, low power, and performance.

Small Size, Low Cost Solution



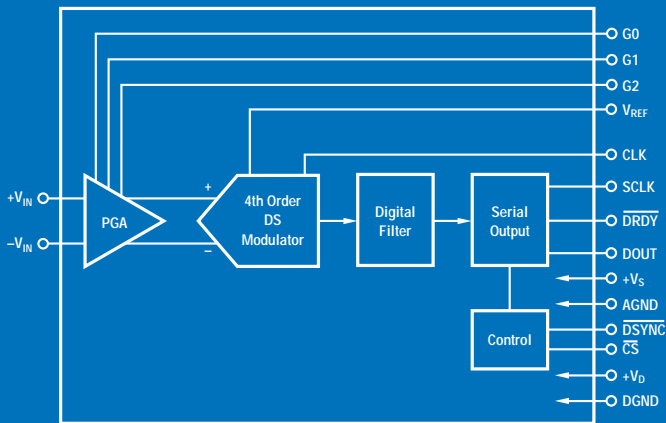
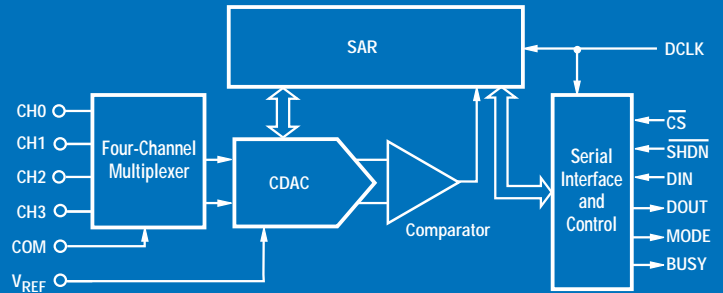
SHOWN ACTUAL SIZE



The application above is an excellent example of Burr Brown's focus on extremely small size and low power products for a variety of applications from Industrial Process Control to a "Speech Bandpass Filtered Data Acquisition System." This small, low cost solution provides the necessary amplification and signal conditioning to interface directly with an Electret microphone with internal FET follower. The input signal is converted to a 12-bit serial digital output using the ADS7822—lowest power, smallest A/D converter. With the OPA2337 packaged in a miniature 8-pin SOT-23-8 package and the ADS7822 in an 8-pin MSOP package, Burr-Brown offers an ideal solution for space-limited and low power applications. This circuit will operate with +2.7V to +5V at less than 1mA of supply current. In addition, the OPA2337's high input impedance allows large resistor values and small physical capacitors, further reducing circuit size.

The Low Cost Per Channel Champ

ADS7841 is a complete 12-bit, 4-channel, SAR A/D converter that offers precision performance, low power, and a price that makes it the only real choice for multi-channel A/D applications with single-ended or differential inputs. The serial data input port provides easy interface to the microprocessor for programming the A/D with a variety of functional options. Its 3mW power consumption at 200kHz data rate, and single 2.7V to 5.25V supply make it ideal for portable applications. Its power down mode reduces the supply current to typically 3µA.

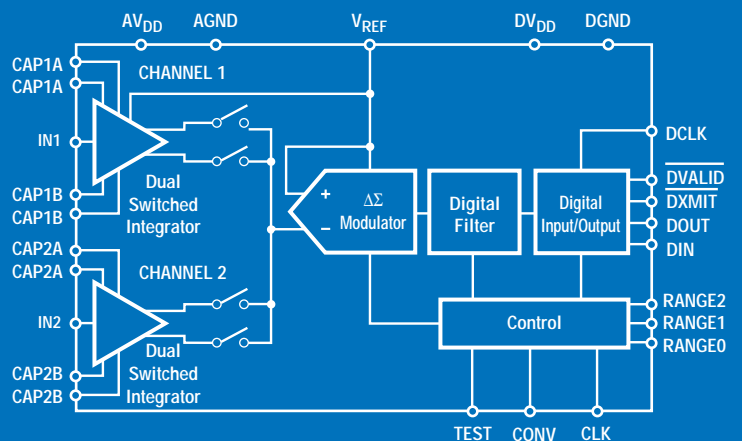


20-Bit Data Acquisition System

ADS1250 is a precision, wide dynamic range, delta-sigma, analog-to-digital converter with 20-bit resolution, 25kHz data rate operating from a single +5V supply. The differential inputs are ideal for direct connections to transducers or low level voltage signals. The dynamic range of the converter is further increased by providing a low-noise Programmable Gain Amplifier (PGA) with gain stages of 1, 2, 4, 8, and 16. The converter includes a flexible synchronous serial interface which is SPI/SSI compatible and also offers a two-wire control mode for low-cost isolation— All at low cost and small size.

20-Bit, Direct Photosensor Digitizing

DDC112 is a perfect choice for direct digitization of dual-channel current input signals from photosensors for applications such as infrared pyrometers, blood analysis, liquid or gas chromatography, and/or CT scanners. The dual integrator per channel provides continuous integration of the input which is multiplexed into a 20-bit delta-sigma A/D converter. Seven internal full-scale ranges and an external user-programmable range allows precision wide dynamic range results. Since the serial I/O registers are independent of the conversion process, multiple DDC112s can be cascaded on a single SPI port to minimize interconnections. All this in a 28-lead SOIC package.



Industrial A/D Converters

Model	Res. (Bits)	Sampling Rate	# Input Channels	Interface	Input Voltage	V _{REF}	Linearity	NMC	SINAD	Power	Package	#Leads	Price (1Kpcs)
fs<5kHz Delta-Sigma Architecture													
ADS1201	130dB	1kHz	1 Diff	Modulator	±10V	Yes	±0.0015%	24-Bit	-	40mW	U	16-Lead	\$ 5.76
ADS1210	24	16kHz	1 Diff	Serial	±10V	Yes	±0.0015%	24-Bit	-	60mW	P, U	18-Lead	\$ 9.60
ADS1211	24	16kHz	4 Diff	Serial	±10V	Yes	±0.0015%	24-Bit	-	60mW	E, P, U	24-Lead	\$ 10.26
ADS1212	22	6.25kHz	1 Diff	Serial	±10V	Yes	±0.0015%	22-Bit	-	8.5mW	P, U	18-Lead	\$ 7.25
ADS1213	22	6.25kHz	4 Diff	Serial	±10V	Yes	±0.0015%	22-Bit	-	8.5mW	E, P, U	24-Lead	\$ 8.50
ADS1216	20	780Hz	4 Diff/8 SE	Serial	PGA (1-128), ±2V _{REF}	Yes	±0.0015%	20-Bit	-	3mW	Y	48-Lead	\$ 6.55
ADS1250	20	25kHz	1 Diff	Serial, DSP	PGA (1-16), ±V _{REF}	No	±0.003%	20-Bit	-	110mW	U	16-Lead	\$ 6.55
ADS1252	20	25kHz	1 Diff	Serial, uC	V _{REF}	No	±0.003%	20-Bit	-	80mW	U	8-Lead	\$ 5.25
DDC101	20	15kHz	1 I _{IN}	Serial	500pC	No	±0.0015%	20-Bit	-	170mW (typ)	U	24-Lead	\$ 18.99
DDC112	20	2kHz/Ch	2 I _{IN}	Serial	50-100pC	No	±0.005% Reading	20-Bit	-	100mW	U	28-Lead	\$ 11.50
5kHz<fs<50kHz Successive Approximation Architecture													
ADS574	12	40kHz	1 SE	1B-P, 3State	10, 20, ±5, 10V	Yes	±0.012%	12-Bit	70dB	100mW	P, U	28-Lead	\$ 12.45
ADS1286	12	20kHz	1 Diff	Serial	V _{REF}	No	±0.024%	12-Bit	72dB (typ)	2.5mW	P, U	8-Lead	\$ 2.98
ADS7806	12	40kHz	1 SE	2B-P, 3State:S	4, 5, ±10V	Yes	±0.011%	12-Bit	72dB	35mW	P, U	28-Lead	\$ 9.47
ADS7807	16	40kHz	1 SE	2B-P, 3State:S	4, 5, ±10V	Yes	±0.0022%	16-Bit	86dB	35mW	P, U	28-Lead	\$ 25.75
ADS7812	12	40kHz	1 SE	Serial	4, 10, ±3.3, 5, 10V	Yes	±0.012%	12-Bit	72dB	35mW	P, U	16-Lead	\$ 9.25
ADS7813	16	40kHz	1 SE	Serial	4, 10, ±3.3, 5, 10V	Yes	±0.003%	16-Bit	87dB	35mW	P, U	16-Lead	\$ 20.00
ADS7824	12	40kHz	4 SE	2B-P, 3State; S	±10V	Yes	±0.012%	12-Bit	72dB	50mW	P, U	28-Lead	\$ 12.30
ADS7825	16	40kHz	4 SE	2B-P, 3State; S	±10V	Yes	±0.003%	16-Bit	86dB	50mW	P, U	28-Lead	\$ 28.46
50kHz<fs<200kHz Successive Approximation Architecture													
ADS774	12	125kHz	1 SE	1B-P, 3State	10, 20, ±5, 10V	Yes	±0.012%	12-Bit	70dB	120mW	P, U	28-Lead	\$ 14.14
ADS7804	12	100kHz	1 SE	1/2B-P, 3State	±10V	Yes	±0.011%	12-Bit	72dB	100mW	P, U	28-Lead	\$ 11.00
ADS7805	16	100kHz	1 SE	1/2B-P, 3State	±10V	Yes	±0.0045%	16-Bit	86dB	100mW	P, U	28-Lead	\$ 20.50
ADS7808	12	100kHz	1 SE	Serial	4, 10, ±3.3, 5, 10V	Yes	±0.011%	12-Bit	72dB	100mW	P, U	20-Lead	\$ 9.95
ADS7809	16	100kHz	1 SE	Serial	4, 10, ±3.3, 5, 10V	Yes	±0.003%	16-Bit	86dB	100mW	P, U	20-Lead	\$ 20.50
ADS7816	12	200kHz	1 Diff	Serial	V _{REF}	No	±0.024%	12-Bit	72dB (typ)	3.5mW	E, P, U	8-Lead	\$ 3.45
ADS7817	12	200kHz	1 Diff	Serial	±V _{REF}	No	±0.024%	12-Bit	71dB (typ)	4mW	E, P, U	8-Lead	\$ 3.95
ADS7820	12	100kHz	1 SE	1/2B-P, 3State	5V	Yes	±0.012%	12-Bit	72dB	100mW	P, U	28-Lead	\$ 10.25
ADS7821	16	100kHz	1 SE	1/2B-P, 3State	5V	Yes	±0.0045%	16-Bit	86dB	100mW	P, U	28-Lead	\$ 20.87
ADS7822	12	75kHz	1 Diff	Serial	V _{REF}	No	±0.018%	12-Bit	71dB (typ)	0.54mW (typ)	E, P, U	8-Lead	\$ 3.15
ADS7832	12	117kHz	4 SE	2B-P, 3State	V _{REF}	No	±0.018%	12-Bit	69dB	7.5mW (typ)	P, N	28-Lead	\$ 16.00
ADS7833	12	150kHz	10 Diff	3X3, Serial	±0.5 – ±2.5V	Yes	±0.048%	12-Bit	72dB (typ)	125mW (typ)	N	68-Lead	\$ 23.75
ADS7841	12	200kHz	4 SE	Serial	V _{REF}	No	±0.024%	12-Bit	72dB	3.5mW	E, P	16-Lead	\$ 4.59
ADS7842	12	200kHz	4 SE	1B-P, 3State	V _{REF}	No	±0.024%	12-Bit	72dB	3.5mW	E	28-Lead	\$ 6.21
ADS7843	12(8)	125kHz	2 SE	Serial; 4-Wire Touch	V _{REF}	No	±0.048%	11-Bit	N/A	1.8mW/2.7V	E	16-Lead	\$ 3.95
ADS7844	12	200kHz	8 SE	Serial	V _{REF}	No	±0.024%	12-Bit	72dB (typ)	4.5mW	E	20-Lead	\$ 3.98
ADS7845	12(8)	200kHz	1 SE	Serial; 5-Wire Touch	V _{REF}	Yes	±0.048%	11-Bit	N/A	1.8mW/2.7V	E	16-Lead	\$ 3.95
ADS7846	12(8)	125kHz	1 SE	Serial; 4-Wire Touch	2.5	Yes	±0.048%	11-Bit	N/A	1.8mW/2.7V	E	16-Lead	\$ 4.97
ADS8320	16	100kHz	1 Diff	Serial	V _{REF}	No	±0.0012%	15-Bit	86dB (typ)	1.8mW	E	8-Lead	\$ 6.25
ADS8321	16	100kHz	1 Diff	Serial	±V _{REF}	No	±0.0012%	15-Bit	86dB (typ)	1.8mW	E	8-Lead	\$ 6.25
200kHz<fs<500kHz Successive Approximation Architecture													
ADS7800	12	333kHz	1 SE	1/2B-P, 3State	±5,10V	Yes	±0.012%	12-Bit	69dB	215mW	H	24-Lead	\$ 23.95
ADS7811	16	250kHz	1 SE	1B-P, 3State	±2.5V	Yes	±0.006%	15-Bit	84dB	250mW	U	28-Lead	\$ 34.00
ADS7815	16	250kHz	1 SE	1B-P, 3State	±2.5V	Yes	±0.006% (typ)	15-Bit	84dB	250mW	U	28-Lead	\$ 20.00
ADS7818	12	500kHz	1 Diff	Serial	+5V	Yes	±0.024%	12-Bit	70dB	15mW	E, P	8-Lead	\$ 5.60
ADS7834	12	500kHz	1 Diff	Serial	+2.5V	Yes	±0.024%	12-Bit	70dB	15mW	E, P	8-Lead	\$ 5.60
ADS7835	12	500kHz	1 Diff	Serial	±2.5V	Yes	±0.024%	12-Bit	70dB	17.5mW	E	8-Lead	\$ 6.25
ADS7852	12	500kHz	8 SE	Parallel	+5V	Yes	±0.024%	12-Bit	71dB (typ)	12mW	Y	32-Lead	\$ 7.15
ADS7861	12	500kHz	4 Diff	2X2, Serial	±2.5V at +2.5V	Yes	±0.024%	12-Bit	70dB (typ)	40mW	E	24-Lead	\$ 6.35
ADS7862	12	500kHz	4 Diff	2X2, Parallel	±2.5V at +2.5V	Yes	±0.024%	12-Bit	70dB (typ)	40mW	Y	32-Lead	\$ 7.55
ADS8323	16	500kHz	1 Diff	Parallel	5	Yes	±0.0045%	15-Bit	90dB	85mW	Y	32-Lead	\$ 7.50
500kHz<fs<5MHz Successive Approximation Architecture													
ADS7810	12	800kHz	1 SE	1B-P, 3State	±10V	Yes	±0.018%	12-Bit	69dB	275mW	U	28-Lead	\$ 23.75
ADS7819	12	800kHz	1 SE	1B-P, 3State	±2.5V	Yes	±0.018%	12-Bit	70dB	275mW	P, U	28-Lead	\$ 12.20
ADS7831	12	600kHz	1 SE	1B-P, 3State	±2.5V	Yes	±0.024%	12-Bit	69dB	275mW	P, U	28-Lead	\$ 11.42

• **Blue** Denotes New Product • **Blue Italic** Denotes Future 1999 Product

• NMC= No Missing Code Resolution • Package Code: E = SSOP, H = Ceramic, N = PLCC, P = Plastic DIP, U = SOIC, Y = TQFP

• # Input Channels: SE = Single-Ended Input, Diff = Differential Input, I_{IN} = Current Input • Interface: 1B-P = 1 Byte Parallel, 2B-P = 2 Bytes Parallel

Recommended resale in USD; FOB USA.

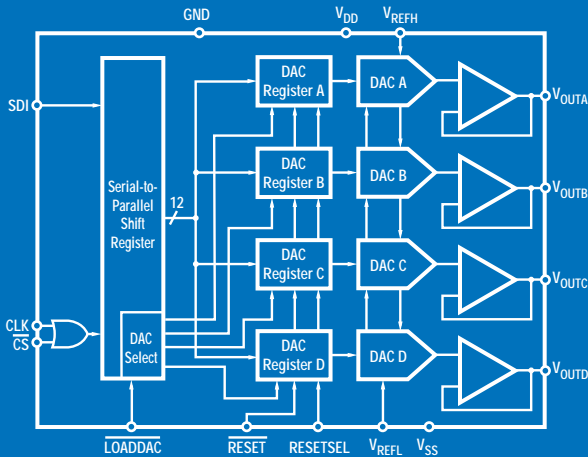
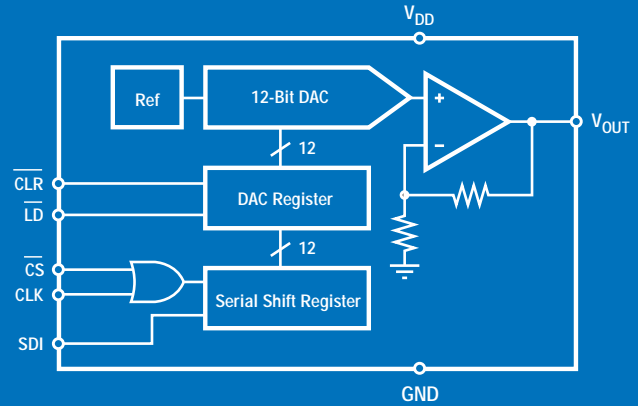


Precision D/A Converters

Burr-Brown's Digital-to-Analog (D/A) converter product line offers a broad selection of high-precision 12-, 16-, 18-, and 20-bit products for your next generation designs with the most cost effective solutions for those critical applications.

Complete 12-Bit D/A, with Reference

DAC7611 is a complete 12-bit, serial input, voltage output D/A converter including reference—all in a small, 8-lead SOIC package, and at low cost. Output resolution is internally set to 1mV/count. The DAC7611 features a voltage output specifically designed for single-supply operation with a settling time of 7 μ s (including settling to within 3LSBs of ground—or 3mV). All this at only 2.5mW of power, making it the ideal solution for low-power applications. The synchronous serial interface is compatible with a wide variety of DSPs and microcontrollers. In addition, two control pins provide a chip select and an asynchronous clear to ensure that the output is zero at power up.

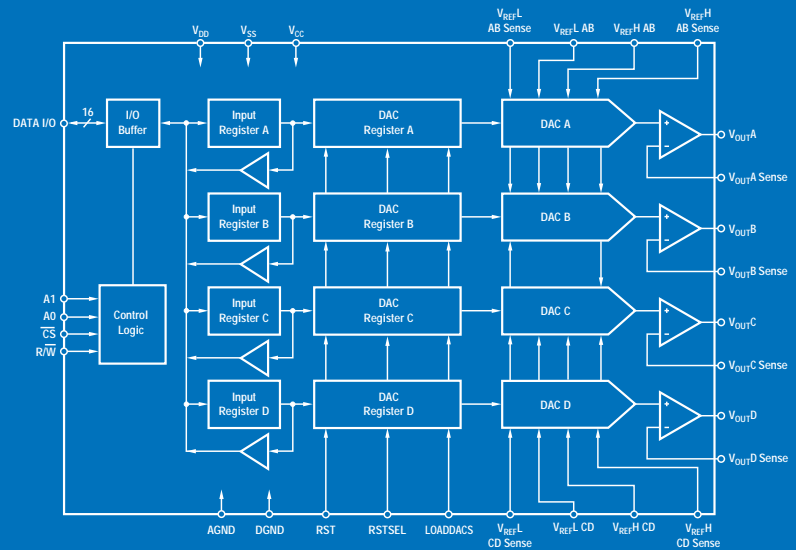


Low-Cost Quad, 16-Bit D/A Voltage Output

DAC7644 is a 16-bit, quad voltage output digital-to-analog converter. It accepts 16-bit parallel input data, has double-buffered DAC input logic (allowing simultaneous update of all DACs), and provides a readback mode of the internal input registers. Programmable asynchronous reset clears all registers to a mid-scale code of 8000_H or to a zero-scale of 0000_H. Low power and small size per DAC make the DAC7644 ideal for automatic test equipment, DAC-per-pin programmers, data acquisition systems, and closed-loop servo-control.

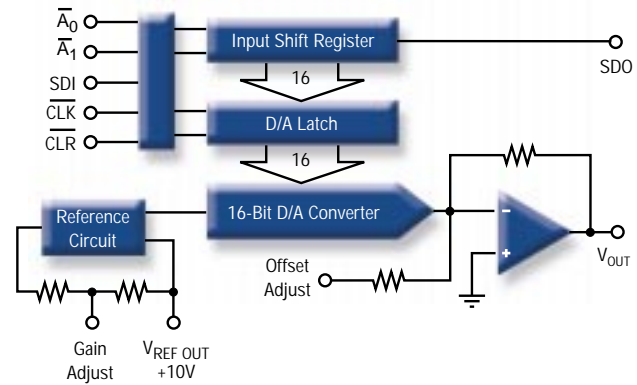
Low-Cost Quad, 12-Bit Serial D/A

DAC7614 and DAC7615 are quad 12-bit, serial input, D/A converters that feature a voltage output specifically designed for single or dual supply, rail-to-rail operation. The DAC7614 has a single-buffered data input allowing individual update of the four D/As, and the DAC7615 has a double-buffered data input allowing simultaneous update of the four D/As. Both offer an asynchronous reset which clears the DAC registers to min-scale (000_H) for unipolar applications, or mid-scale (800_H) for bipolar applications. These D/As have a differential reference input (V_{REFH} & V_{REFL}) that allows the output voltage swing to be easily set. Channel-to-channel matching is also specified.



Complete 16-Bit, Serial Input D/A

DAC716 is a complete 16-bit, serial input, 0 to +10V unipolar voltage output D/A converter including a low noise +10V reference—all in a small, 16-lead DIP or SOIC package, and at low cost. The DAC716 features a unipolar voltage output specifically designed for ±12V to ±15V supply operation with a maximum settling time of 10μs, making it the ideal solution for high resolution applications. The synchronous serial interface is compatible with a wide variety of DSPs and microcontrollers. In addition, two control pins provide the option of cascading multiple converters and an asynchronous clear to ensure that the output is zero at power up.



Industrial D/A Converters

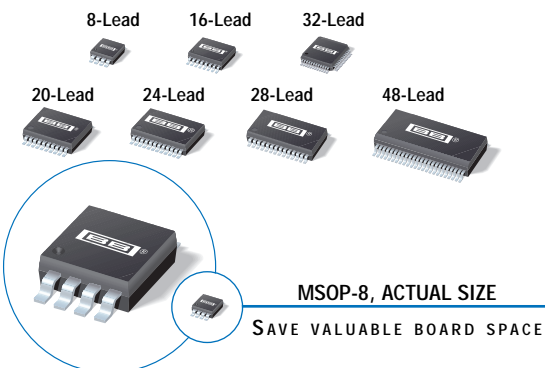
Model	Resolution (Bits)	Settling Time	# of D/As	Interface	Output Voltage	V _{REF}	Linearity	Monotonic	Power, Voltagess	Package	# Leads	Price (1Kpcs)
DAC707	16	8μs	1	Parallel	±10V	Yes	±0.003%	14-Bit	950mW, +5 & ±15	P	28-Lead	\$ 23.53
DAC709	16	8μs	1	Parallel	+10, ±5, 10V	Yes	±0.003%	14-Bit	950mW, +5 & ±15	H	24-Lead	\$ 43.77
DAC712	16	10μs	1	Parallel	±10V	Yes	±0.003%	16-Bit	600mW, ±15	P, U	28-Lead	\$ 12.38
DAC714	16	10μs	1	Serial	±10V	Yes	±0.0015%	16-Bit	625mW, ±15	P, U	16-Lead	\$ 12.38
DAC715	16	10μs	1	Parallel	+10V	Yes	±0.003%	16-Bit	600mW, ±15	P, U	28-Lead	\$ 12.38
DAC716	16	10μs	1	Serial	+10V	Yes	±0.003%	15-Bit	625mW, ±15	P, U	16-Lead	\$ 12.38
DAC725	16	8μs	2	Parallel	±10V	Yes	±0.003%	14-Bit	1175mW, +5 & ±15	P	28-Lead	\$ 41.21
DAC811	12	4μs	1	Parallel	+10, ±5, 10V	Yes	±0.006%	12-Bit	800mW, +5 & ±15	P, U	28-Lead	\$ 9.85
DAC813	12	6μs	1	Parallel	+10, ±5, 10V	Yes	±0.006%	12-Bit	330mW, ±15	P, U	28-Lead	\$ 10.83
DAC1220	20	15ms	1	Serial	+5V	No	±0.0015%	20-Bit	3mW, +5	E	16-Lead	\$ 6.25
DAC1221	16	2ms	1	Serial	+2.5V	No	±0.0015%	16-Bit	2mW, +3	E	16-Lead	\$ 5.50
DAC7611	12	7 (typ)	1	Serial	+4V	Yes	±0.012%	12-Bit	5mW, +5	U	8-Lead	\$ 3.75
DAC7612	12	10μs	2	Serial	+4V	Yes	±0.012%	12-Bit	7mW, +5	U	8-Lead	\$ 4.25
DAC7613	12	10μs	1	Parallel	+V _{REF} , ±V _{REF}	No	±0.012%	12-Bit	2.5mW, +5 or ±5	E	24-Lead	\$ 3.90
DAC7614	12	10μs	4	Serial	+V _{REF} , ±V _{REF}	No	±0.012%	12-Bit	20mW, +5 or ±5	P, U/E	16/20-Lead	\$ 6.30
DAC7615	12	10μs	4	Serial	+V _{REF} , ±V _{REF}	No	±0.012%	12-Bit	20mW, +5 or ±5	P, U/E	16/20-Lead	\$ 6.30
DAC7621	12	10μs	1	Parallel	+4V	Yes	±0.012%	12-Bit	5mW, +5	E	24-Lead	\$ 4.55
DAC7624	12	10μs	4	Parallel	±V _{REF}	No	±0.012%	12-Bit	20mW, +5 or ±5	P, U	28-Lead	\$ 9.15
DAC7625	12	10μs	4	Parallel	+V _{REF}	No	±0.012%	12-Bit	20mW, +5 or ±5	P, U	28-Lead	\$ 9.15
DAC7634	16	10μs	4	Serial	+V _{REF} , ±V _{REF}	No	±0.0015%	15-Bit	20mW, +5 or ±5	E	48-Lead	\$ 18.97
DAC7644	16	10μs	4	Parallel	+V _{REF} , ±V _{REF}	No	±0.0015%	15-Bit	20mW, +5 or ±5	E	48-Lead	\$ 20.71
DAC7724	12	10μs	4	Parallel	±V _{REF}	No	±0.012%	12-Bit	145mW, ±15	N, U	28-Lead	\$ 11.75
DAC7734	16	10μs	4	Serial	±V _{REF}	No	±0.0015%	16-Bit	185mW, ±15	E	48-Lead	\$ 27.10
DAC7744	16	10μs	4	Parallel	±V _{REF}	No	±0.0015%	16-Bit	185mW, ±15	E	48-Lead	\$ 29.58

• **Bold Blue** Denotes New Product • **Bold Italic Cyan** Denotes Future 1999 Product
 • NMC = No Missing Code Resolution • Package Code: E = SSOP, H = Ceramic, P = Plastic DIP, U = SOIC

More Performance, Less Space

Burr-Brown uses the latest in package technology to provide the smallest surface-mount packaging for our complete lines of precision A/D and D/A converters. With these cost-effective solutions for those critical applications, Burr-Brown offers the best selection for your next generation designs.

Actual Package Sizes



Burr-Brown

Corporate Profile

Burr-Brown Corporation designs, manufactures, and markets a broad line of analog and mixed-signal integrated circuits used in the processing of real-world electronic signals. These products are used in a wide range of markets and applications, including industrial and process control, telecommunications, test and measurement, medical and scientific instrumentation, medical imaging, digital audio and video, personal computing, and multimedia.

Burr-Brown's product strategy is to design innovative, proprietary products which bring a very high level of functional value to our customers' applications. There are currently over 1200 products in our portfolio. We produce both standard products which are used in a broad range of applications, and specially developed products optimally suited for emerging, fast growth, target applications such as audio signal processing and broadband communications.

Corporate Headquarters

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Texas: Dallas (972) 783-4555

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