Precision DAC
Selector Guide

Contents

Introduction

Welcome to the Analog Devices digital-to-analog converter (DAC) selection guide. This guide is designed to help facilitate product selection based on your application needs. We've organized the guide to distinguish the strengths of each product relative to alternatives. For further details, including temperature operating range or suitability for applications such as aerospace or automotive, please visit the website parametric tables. A detailed data sheet review and product evaluation should be performed before selecting the right product for your application. Each DAC is supported with a demo system associated with the free, easy to use software tools and example code that enables users to quickly and easily evaluate the performance of these digital-to-analog converters.

Voltage Output (V$_{OUT}$) DACs

Analog Devices offers a comprehensive family of resistor string and R-2R voltage output (V$_{OUT}$) digital-to-analog converters. From eight bits up to an industry-leading 20 bits of resolution, a single channel to as many as 40 channels in high density packages, flexible I/O, high dc precision, and lowest glitch, we have a DAC to suit your application.

Fast Precision DACs

For test & measurement and Hardware-in-the-Loop (HIL) applications demanding both DC and AC performance, Analog Devices fast precision digital-to-analog converter (DAC) enable higher speed waveform generation up to 33MSPS with 4x oversampling delivering clean signal spectrums

Key

- ■ Suggested part for that given cell. The DACs are categorized by resolution, sampling rate, and input channel count.
- ■ Higher accuracy—Indicates that the DAC is higher precision (better INL, noise, glitch) vs. a similar product in the same cell.
- ■ Lower power—Indicates that the DAC enables lower power operation vs. a similar product in the same cell.
- ■ Smaller solution—Indicates that the DAC enables a smaller solution size vs. a similar product in the same cell. The DAC may have a smaller package footprint or integrate additional functionality such as output amplifiers or monitoring multiplexers.
- ■ HART Connectivity/Compatibility
- ■ ≥9 I²C addresses—Indicates that the DAC may be configured for nine or more I²C user-selectable slave addresses, allowing many DACs on the same bus and minimizing address conflicts with other components.
- ■ Lower glitch—Indicates lower midscale glitch impulse vs. a similar product in the same cell, making it possible to produce higher frequency, lower noise output waveforms.
- ■ ADC/DAC combo—These devices offer ADCs, DACs, GPIO, and temperature sensor functionality in a single IC.
- ■ >5 MHz bandwidth—Indicates a higher bandwidth multiplying DAC, which is more suitable for signal generation. The multiplying bandwidth is specified as the reference-input frequency at which the gain is compressed by –3 dB.

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Voltage Output (V$_{out}$) DACs

Single-Channel to 8-Channel, Low Voltage, Single-Supply V$_{OUT}$ DACs

Analog Devices offers the broadest portfolio of low voltage single-supply DACs in the industry, serving a wide class of applications due to the low power, smallest solution footprint, and robust range of features, with flexible SPI or I²C interfaces. ADI's *nanoDAC+*® products offer enhanced features such as higher accuracy, improved dc performance, increased robustness, and lower glitch energy, among other advantages.

Featured Product:

AD5676R: Octal, 16-Bit, *nanoDAC+* with 2 ppm/°C Reference

- ▶ High relative accuracy (INL): ±3 LSB maximum at 16 Bits
- ▶ Total unadjusted error (TUE): ±0.14% of FSR maximum
- ▶ Low drift 2.5 V reference: 2 ppm/°C typical, 5 ppm/°C maximum
- ▶ –40°C to +125°C operation
- ▶ 2.7 V to 5.5 V power supply range
- ▶ 20-lead TSSOP and 4 mm × 4 mm LFCSP

Single-Channel to 8-Channel, Low Voltage, Single-Supply V$_{OUT}$ DACs

Resolution	Output Type	Interface	1-Channel Unbuffered Ext. Ref	1-Channel Ext. Ref	1-Channel Int. Ref	2-Channel Ext. Ref	2-Channel Int. Ref	4-Channel Ext. Ref	4-Channel Int. Ref	8-Channel Ext. Ref	8-Channel Int. Ref
20-Bit	Unipolar Single Supply	SPI	■ MAX5719								
18-Bit	Unipolar Single Supply	SPI		■ AD5680ᴴ ■ MAX5318							
16-Bit	Unipolar Single Supply	SPI	■ LTC2641-16 ■ MAX5717 ■ AD5541A ■ AD5062ᴴ ■ AD5063	■ AD5683 ■ AD5662ᴴ ■ AD5060 ■ AD5061 ■ LTC2601	■ AD5683R ■ AD5660ᴴ	■ AD5689ᴴ ■ AD5663ᴴ ■ AD5065 ■ LTC2602	■ AD5689Rᴴ ■ AD5663Rᴴ	■ AD5686 ■ AD5664 ■ AD5066	■ AD5686Rᴴ ■ AD5664R ■ LTC2654-16	■ AD5676 ■ LTC2600	■ AD5676Rᴴ ■ AD5668 ■ LTC2656-16 ■ AD5678
16-Bit	Unipolar Single Supply	I²C		■ AD5693	■ AD5693R	■ AD5667	■ AD5667R	■ AD5696ᴴ ■ AD5665	■ AD5696Rᴴ ■ AD5665R	■ AD5675	■ AD5675Rᴴ ■ AD5669Rᴴ
14-Bit	Unipolar Single Supply	SPI	■ LTC2641-14 ■ AD5551	■ AD5040ᴴ ■ AD5641	■ AD5682R ■ AD5640ᴴ	■ AD5045	■ AD5643R	■ AD5044	■ AD5685Rᴴ ■ AD5644R	■ LTC2610	■ AD5392 ■ AD5648ᴴ
14-Bit	Unipolar Single Supply	I²C			■ AD5692R		■ AD5647R		■ AD5695Rᴴ ■ AD5645R		■ AD5392
12-Bit	Unipolar Single Supply	PWM				■ LTC2644-12ᶻ			■ LTC2645-12ᶻ		
12-Bit	Unipolar Single Supply	SPI	■ LTC2641-12 ■ AD5512Aᴴ	■ AD5621 ■ AD5320 ■ LTC2621	■ AD5681R ■ LTC2630-12ᴴ ■ LTC2640-12ᴴ ■ AD5620ᴴ	■ AD5687ᴴ ■ AD5025 ■ AD5322 ■ AD5323 ■ LTC2622	■ AD5687Rᴴ ■ LTC2632-12ᴴ ■ AD5623R	■ AD5684ᴴ ■ AD5624R ■ AD5024ᴴ ■ LTC2624	■ AD5684Rᴴ ■ LTC2654-12ᴴ ■ LTC2634-12ᴴ	■ LTC2620 ■ AD5328	■ AD5672ᴴ ■ AD5628 ■ LTC2656-12ᴴ ■ LTC2636-12ᴴ ■ AD5592R
12-Bit	Unipolar Single Supply	I²C		■ AD5622 ■ AD5321	■ AD5691R ■ LTC2631-12ᴴ	■ AD5339 ■ AD5627 ■ LTC2627ᴴ	■ LTC2633-12ᶻ ■ AD5627R ■ AD5697Rᴴ	■ AD5694ᴴ ■ AD5325 ■ AD5625ᴴ ■ LTC2655-12ᶻ	■ AD5694Rᴴ ■ AD5625Rᴴ	■ LTC2625ᴴ	■ AD5671Rᴴ ■ AD5629Rᴴ ■ LTC2657-12ᴴ ■ LTC2637-12ᴴ ■ AD5593R
10-Bit	Unipolar Single Supply	PWM				■ LTC2644-10ᶻ			■ LTC2645-10ᶻ		
10-Bit	Unipolar Single Supply	SPI		■ AD5611 ■ AD5310	■ AD5310R ■ LTC2630-10ᴴ	■ LTC1662 ■ AD5313 ■ AD5312	■ AD5313Rᴴ	■ AD5314 ■ LTC1664 ■ AD5317	■ AD5317Rᴴ	■ AD5318 ■ LTC1660	■ LTC2636-10ᴴ
10-Bit	Unipolar Single Supply	I²C		■ AD5612 ■ AD5311	■ AD5311R ■ LTC2631-10ᴴ ■ LTC1669	■ AD5338	■ AD5338R ■ LTC2633-10ᶻ	■ AD5316 ■ AD5315	■ AD5316Rᴴ ■ LTC2635-10ᶻ		■ LTC2637-10ᴴ
10-Bit	Unipolar Single Supply	SMBus			■ LTC1663						
8-Bit	Unipolar Single Supply	PWM				■ LTC2644-8ᶻ			■ LTC2645-8ᶻ		
8-Bit	Unipolar Single Supply	SPI		■ AD5601 ■ AD5300	■ LTC2630-8ᴴ ■ LTC2640-8ᴴ	■ AD5302 ■ AD7303	■ LTC2632-8ᴴ	■ AD5307 ■ AD5304	■ LTC2634-8ᴴ	■ AD5308 ■ LTC1665	■ LTC2636-8ᴴ
8-Bit	Unipolar Single Supply	I²C		■ AD5602 ■ AD5301	■ LTC2631-8ᴴ	■ AD5337	■ LTC2633-8ᴴ	■ AD5306 ■ AD5305	■ LTC2635-8ᴴ		■ LTC2637-8ᴴ

- ■ Higher accuracy
- ■ Lower power
- ■ Smaller solution
- ■ ≥9 I²C addresses
- ■ Lower glitch
- ■ ADC/DAC combo
- ■ Suggested part
- ᴴ Reset to midscale or zero-scale options
- ᶻ Reset to high-Z, midscale, or zero-scale

Single-Channel to 16-Channel, Bipolar Voltage Output DACs

Analog Devices' family of bipolar voltage output DACs offers exceptional 1 ppm level accuracy at up to 20-bit resolutions and robust output drive, capable of driving a variety of demanding loads. SoftSpan™ versions enable each output range to be individually configured via software or pin-strapping. This provides flexibility in reuse across multiple product platforms and reduces the complexity of board design and layout, in addition to providing a more accurate signal chain, resulting in higher system performance and faster design times.

Featured Product:

AD5761R: Multiple Range, 16-Bit, Bipolar Voltage Output DACs with 2 ppm/°C Reference

- Eight software-programmable output ranges: 0 V to 5 V, 0 V to 10 V, 0 V to 16 V, 0 V to 20 V, ±3 V, ±5 V, ±10 V, and −2.5 V to +7.5 V; 5% overrange
- Low drift 2.5 V reference: ±2 ppm/°C typical
- Total unadjusted error (TUE): 0.1% FSR maximum
- 16-bit resolution: ±2 LSB maximum INL
- AD5761R-EP supports defense and aerospace applications

Single-Channel to 16-Channel, Bipolar Voltage Output DACs

Resolution	Output Type	Interface	1-Channel Unbuffered Ext. Ref	1-Channel Ext. Ref	1-Channel Int. Ref	2-Channel Ext. Ref	2-Channel Int. Ref	4-Channel Ext. Ref	4-Channel Int. Ref	8-Channel Ext. Ref	8-Channel Int. Ref	16-Channel Ext. Ref	16-Channel Int. Ref
20-Bit	Bipolar	SPI	AD5790 AD5791										
18-Bit	Bipolar	SPI	AD5780 AD5781										
16-Bit	SoftSpan Bipolar	SPI		AD5761[M]	AD5761R[M]	AD5752	AD5752R[M]	LTC2704-16 AD5754[M]	LTC2664-16[M] AD5754R[M]		LTC2666-16[M] LTC2686-16		LTC2688-16
16-Bit	Bipolar	SPI	AD5760 AD5570 LTC2642-16 AD5542A	AD5570 AD7849	AD3541R	AD5763	AD5762R AD3542R	AD5764 AD5765	AD5764R	AD5362			
14-Bit	SoftSpan Bipolar	SPI				AD5732[M]	AD5732R[M]	AD5734[M] LTC2704-14	AD5734R[M]				
14-Bit	Bipolar	SPI	LTC2642-14 AD5552	AD5531				AD7834	AD5744R	AD5363			
12-Bit	SoftSpan Bipolar	SPI		AD5721[M]	AD5721R[M]	AD5722[M]	AD5722R[M]	LTC2704-12 AD5724[M]	LTC2664-12[M] AD5724R[M]		LTC2666-12[M] LTC2686-12		LTC2688-12
12-Bit	Bipolar	SPI	LTC2642-12 AD5512A	AD5530			AD7249	AD5726 AD7398					
10-Bit	Bipolar ±5 V	SPI						AD7399					
8-Bit	Bipolar ±5 V	SPI						AD7304					

- ■ Suggested part
- ■ Higher accuracy
- ■ Lower glitch
- [M] Reset to midscale or zero-scale options
- [Z] Reset to high-Z, midscale, or zero-scale options

12-Channel to 40-Channel Voltage Output DACs

Targeted at optical communications including Mach-Zehnder modulator bias control, as well as LED displays, analog output modules, antenna arrays, and system biasing, these high density, high channel count DACs offer high output current capability, output monitoring multiplexers, and output span flexibility for ease of reuse in the industry's smallest footprints.

Featured Products:

LTC2688: 16-Channel, 16-/12-Bit Voltage Output DAC with 10 ppm/°C Max Reference

- 16 DACs in a small 6 mm × 6 mm LFCSP package
- Internal precision reference: ±5 ppm/°C (max)
- Independently programmable output ranges: 0 V to 5 V, 0 V to 10 V, ±5 V, ±10 V, ±15 V
- Maximum INL error: ±3 LSB (16 bits), ±1 LSB (12 bits)
- Output buffers drive ±20 mA and 1000 pF loads
- Channel monitoring multiplexer
- 1.8 V to 5 V SPI serial interface
- −40°C to +125°C operation

AD5766/AD5767: 16-Channel, 16-/12-Bit Voltage Output DACs

- 16 DACs in small 4 mm × 4 mm WLCSP or 6 mm × 6 mm LFCSP packages
- Integrated DAC output buffers with ±20 mA output current capability
- Independently programmable output ranges: −20 V to 0 V, −16 V to 0 V, −10 V to 0 V, −10 V to +6 V, −12 V to +14 V, −16 V to +10 V, ±5 V, and ±10 V
- Maximum INL error: ±16 LSB (16 bits), ±1 LSB (12 bits)
- Integrated reference buffers
- Channel monitoring multiplexer
- 1.8 V to 5 V SPI serial interface
- −40°C to +105°C operation

12-Channel to 40-Channel Voltage Output DACs

Resolution	Output Type	Interface	12-Channel Int. Ref	16-Channel Ext. Ref	16-Channel Int. Ref	20-Channel Int. Ref	32-Channel Ext. Ref	32-Channel Int. Ref	40-Channel Ext. Ref	40-Channel Int. Ref
16-Bit	SoftSpan bipolar	SPI			LTC2668-16[M]					
16-Bit	Bipolar	SPI		AD5766 AD5360			AD5372 MAX5734 MAX5735		AD5370	
16-Bit	Unipolar single supply	SPI		AD5679	LTC2668-16[M] AD5679R LTC2688-16		MAX5732 MAX5733			
16-Bit	Unipolar single supply	I²C			AD5677					
14-Bit	Bipolar	SPI		AD5361			AD5373 AD5378	AD5532 AD55532HS	AD5371 AD5379	
14-Bit	Unipolar single supply	SPI			AD5390			AD5382		AD5380 AD5384
14-Bit	Unipolar single supply	I²C			AD5390			AD5382		AD5380 AD5384
12-Bit	SoftSpan bipolar	SPI			LTC2668-12[M] LTC2688-12[M]					
12-Bit	Bipolar	SPI		AD5767 AD5516			MAX5774			
12-Bit	Unipolar single supply	SPI	MAX11311	AD5674	LTC2668-12[M] LTC2688-12[M] AD5674R AD5391 AD5590	MAX11301		AD5383		AD5381
12-Bit	Unipolar single supply	I²C	MAX11312		AD5391 AD5673R	MAX11300		AD5383		AD5381

- ■ Suggested part
- ■ Lower power
- ■ Smaller solution
- [M] Reset to midscale or zero-scale options
- [Z] Reset to high-Z, midscale, or zero-scale options

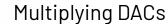## Parallel Interface Voltage Output DACs

Resolution	Output Type	Interface	1-Channel		2-Channel		4-Channel		8-Channel	32-Channel	40-Channel
			Ext. Ref	Int. Ref	Ext. Ref	Int. Ref	Ext. Ref	Int. Ref	Ext. Ref	Int. Ref	Int. Ref
16-Bit	Bipolar	Parallel	■ AD7846 ■ LTC1821								
16-Bit	Unipolar single supply	Parallel		■ LTC1657							
14-Bit	Bipolar	Parallel					■ AD7835 ■ AD7836		■ AD7841	■ AD5378	AD5379
14-Bit	Unipolar single supply	Parallel								■ AD5382 ■ AD5532	■ AD5380 ■ AD5384
12-Bit	Bipolar	Parallel			■ AD7847 ■ AD7837	■ AD7247 ■ AD7237	■ DAC8412 ■ DAC8413* ■ AD5725*				
12-Bit	Unipolar single supply	Parallel	■ AD5340 ■ AD5341	■ LTC1450	■ AD5342 ■ AD5343		■ AD5344 ■ AD5725*		■ AD5348	■ AD5383	■ AD5381
10-Bit	Bipolar	Parallel					■ AD5583				
10-Bit	Unipolar single supply	Parallel	■ AD5331		■ AD5333		■ AD5335 ■ AD5336		■ AD5347		
8-Bit	Bipolar	Parallel	■ AD7224				■ AD7225 ■ AD7226 ■ AD7305				
8-Bit	Unipolar single supply	Parallel	■ AD7801		■ AD5332 ■ AD7302		■ AD5334 ■ AD7305		■ AD5346		

■ Suggested part
* Reset to midscale or zero-scale options

Multiplying DACs

A multiplying R-2R current output DAC differs from a fixed-reference DAC in that it can apply a high resolution, digitally set gain to a varying wideband analog signal at the reference input, making it inherently suitable for ac signal processing applications. The SoftSpan feature allows software selectable output spans that reduce the solution size by eliminating the need to add precision gain stages and the associated external jumpers, costly precision resistors, and amplifier circuitry. Integrated precision resistors allow reference inversion, bipolar offset, offset, and gain adjustment.

Featured Product:

LTC2756/LTC2758: 18-Bit, Single and Dual Current Output DACs with SoftSpan Outputs

▶ Maximum 18-bit INL error: ±1 LSB over temperature
▶ Program or pin-strap six output ranges: 0 V to 5 V, 0 V to 10 V, −2.5 V to +7.5 V, ±2.5 V, ±5 V, ±10 V
▶ Glitch impulse: 0.4 nV/s (3 V), 2 nV/s (5 V)
▶ 18-bit settling time: 2.1 µs

▶ 2.7 V to 5.5 V single supply operation
▶ 1 µA maximum supply current
▶ Voltage controlled offset and gain trims
▶ Serial interface with readback of all registers

Multiplying DACs

Resolution	Output Type	Interface	1-Channel	2-Channel	4-Channel	8-Channel
18-Bit	SoftSpan bipolar	SPI	■ LTC2756	■ LTC2758		
18-Bit	SoftSpan bipolar	Parallel	■ LTC2757			
16-Bit	SoftSpan bipolar	SPI	■ LTC1592	■ LTC2752	■ LTC2754-16	
16-Bit	SoftSpan bipolar	Parallel	■ LTC2751-16	■ LTC2753-16	■ LTC2755-16	
16-Bit	Bipolar	SPI	■ AD5543 ■ LTC1596* ■ LTC1595	■ AD5545*	■ AD5544*	
16-Bit	Bipolar	Parallel	■ AD5546* ■ LTC1597*	■ AD5547*		
14-Bit	SoftSpan bipolar	SPI	■ LTC1589			
14-Bit	SoftSpan bipolar	Parallel	■ LTC2751-14	■ LTC2753-14	■ LTC2755-14	
14-Bit	Bipolar	SPI	■ AD5453 ■ AD5553 ■ AD5446	■ AD5555*	■ AD5554*	
14-Bit	Bipolar	Parallel	■ LTC1591* ■ AD5556*	■ AD5557*		
12-Bit	SoftSpan bipolar	SPI	■ LTC1588		■ LTC2754-12	
12-Bit	SoftSpan bipolar	Parallel	■ LTC2751-12	■ LTC2753-12	■ LTC2755-12	
12-Bit	Bipolar	SPI	■ AD5441 ■ AD5443 ■ AD5444 ■ AD5452	■ LTC1590 ■ AD5415 ■ AD5449		
12-Bit	Bipolar	Parallel	■ AD5445	■ AD5405 ■ AD5447		
10-Bit	Bipolar	SPI	■ AD5451 ■ AD5432	■ AD5439	■ AD7564	■ AD7568
10-Bit	Bipolar	Parallel	■ AD5433	■ AD5440		
8-Bit	Bipolar	SPI	■ AD5450 ■ AD5425 ■ AD5426	■ AD5429		
8-Bit	Bipolar	Parallel	■ AD5424	■ AD5428		

■ Suggested part
■ >5 MHz bandwidth
* Reset to midscale or zero-scale options

Special Function DACs

PWM to Voltage Output DACs

Analog Devices' LTC2645 and LTC2644 PWM to V$_{OUT}$ DACs convert a PWM (pulse width modulation) input to an accurate, stable, buffered voltage without the ripple, slow settling, and external passive components of discrete filter implementations. This family of products provides a simple bolt-on solution to accurately set and adjust up to four voltages without a single line of code required. Applications include isolated motor control, automotive headlights, industrial lighting, flight telemetry, medical monitors, and many other applications that benefit from the simple control interface.

Key Features:

- No latency PWM-to-voltage conversion
- Voltage output updates and settles within 8 μs
- 100 kHz to 30 Hz PWM input frequency
- ±2.5 LSB max INL; ±1 LSB max DNL (12-bit)
- Pin-selectable internal or external reference

- 2.7 V to 5.5 V supply range
- 1.71 V to 5.5 V input voltage range
- Low power: 4 mA at 3 V, <1 μA power down
- −40°C to +125°C operation

PWM to Voltage Output DACs

		Voltage Output Range	Interface	2-Channel	4-Channel
Resolution	12-Bit	0 V to 5 V	PWM	■ LTC2644-12	■ LTC2645-12
	10-Bit	0 V to 5 V	PWM	■ LTC2644-10	■ LTC2645-10
	8-Bit	0 V to 5 V	PWM	■ LTC2644-8	■ LTC2645-8

■ Suggested part

Micropower Voltage Output DACs

Micropower DACs are ideal for portable battery-operated equipment, and for generating bias or control voltages in a variety of space-constrained and power-sensitive applications.

Featured Product:

AD5641: 2.7 V to 5.5 V, <100 μA, 14-Bit nanoDAC in LFCSP and SC70

- Single 14-bit voltage output DAC
- Micropower operation: 100 μA maximum at 5 V
- Power down to typically 0.2 μA at 3 V

- ±4 LSB INL (B version)
- 2.7 V to 5.5 V power supply
- 6-lead LFCSP and SC70 packages

Micropower Voltage Output DACs

		Interface	1-Channel		2-Channel				4-Channel		8-Channel	
				I$_Q$ (3 V)	Ext. Ref	I$_Q$ (3 V)	Int. Ref	I$_Q$ (3 V)	Ext. Ref	I$_Q$ (3 V)	Ext. Ref	I$_Q$ (3 V)
Resolution	16-Bit	SPI	■ LTC2641-16 ■ LTC2641-16™	120 μA 120 μA								
		I²C			■ LTC2607	520 μA						
	14-Bit	SPI	■ AD5641 ■ LTC2641-14 ■ LTC2642-14™	60 μA 120 μA 120 μA								
		I²C			■ LTC2617	520 μA						
	12-Bit	Parallel	■ AD5340 ■ AD5341	115 μA								
		SPI	■ LTC2640-12 ■ LTC2641-12 ■ LTC2642-12™	180 μA 120 μA 120 μA								
		I²C	■ LTC2631-12	180 μA	■ LTC2627	520 μA						
	10-Bit	SPI			■ LTC1662 ■ LTC1661	3 μA 95 μA			■ LTC1664	186 μA	■ LTC1660	340 μA
		I²C	■ LTC2631-10	180 μA			■ LTC1669	60 μA				
		SMBus					■ LTC1663	60 μA				
		Parallel	■ AD5331	115 μA								
	8-Bit	SPI	■ LTC2640-8	180 μA							■ LTC1665	340 μA
		Parallel	■ AD5330	115 μA								
		I²C	■ LTC2631-8	180 μA								

■ Suggested part

Current Source-Sink DACs

Analog Devices' current source DAC portfolio is ideal for photonics control applications where low current noise density, low dropout voltage, and high power efficiency, in addition to high channel density, are critical to system performance. The flexibility of the configurable current source DAC outputs, and 300 mA current delivery, make them suitable for proportional solenoid drives.

The multichannel precision IDACs AD5770R and LTC2662 are widely used in optical communications applications for tunable laser biasing, semiconductors optical amplifiers, and MZM modulators.

Featured Product

LTC2662: 5-Channel, 300 mA Current Source Output 16-/12-Bit SoftSpan DAC

- Eight per-channel programmable output ranges:
  - 300 mA, 200 mA, 100 mA, 50 mA, 25 mA, 12.5 mA, 6.25 mA, and 3.125 mA
  - Can be paralleled for up to 1.5 A
- Flexible 2.85 V to 33 V supply voltage

- 1 V dropout guaranteed
- Separate voltage supply per output channel
- Internal switches to optional negative supply
- −40°C to +125°C operation

AD5770R: 6-Channel, −60 mA/+300 mA, 14-Bit Current Output DAC

- Programmable channel ranges:
  - Channel 0: 0 mA to 300 mA, −60 mA to + 300 mA, −60 mA to 0 mA
  - Channel 1: 0 mA to 140 mA, 0 mA to 250 mA
  - Channel 2: 0 mA to 55 mA, 0 mA to 150 mA
  - Channel 3, Channel 4, Channel 5: 0 mA to 45 mA, 0 mA to 100 mA

- Current source scale back by 0.5×
- Die temperature monitor along with integrated thermal shutdown
- Current monitoring on each IDAC channel via mux out pin
- Compliance voltage monitor
- Integrated precision reference

Current Source-Sink DACs

		Interface	Channels	Current Sink		Current Source	
				Part Number	Output Range	Part Number	Output Ranges
Resolution	16-Bit	SPI	5			■ LTC2662-16 ■ LTC2672-16	Software selectable all channels: 3.125 mA, 6.25 mA, 12.5 mA, 25 mA, 50 mA, 100 mA, 200 mA, 300 mA
	14-Bit	SPI	6	■ AD5770R	60 mA	■ AD5770R	Software selectable all channels: 45 mA, 55 mA, 100 mA, 140 mA, 150 mA, 250 mA, 300 mA
			9	■ MAX5113	60 mA	■ MAX5113	Software selectable all channels: 2 mA, 10 mA, 15 mA, 20 mA, 35 mA, 90 mA, 180 mA, 300 mA
		I²C	9	■ MAX5832	60 mA	■ MAX5832	Software selectable all channels: 2 mA, 10 mA, 15 mA, 20 mA, 35 mA, 90 mA, 180 mA, 300 mA
	12-Bit	SPI	5			■ LTC2662-12 ■ LTC2672-12	Software selectable all channels: 3.125 mA, 6.25 mA, 12.5 mA, 25 mA, 50 mA, 100 mA, 200 mA, 300 mA
	10-Bit	I²C	1	■ AD5398 ■ AD5398A ■ AD5821 ■ AD5821A	3 mA to 120 mA		
		I²C SPI	2			■ MAX5550	30 mA
	8-Bit		2			■ MAX5548	30 mA

■ Suggested part
■ Lower power

High Voltage DACs

High voltage DACs are targeted at optical MEMS (microelectromechanical systems), micropositioning applications for piezo actuators, and level setting for automotive test and measurement.

Featured Product

AD45335: 32-Channel, 14-Bit V_{OUT} DAC with Full-Scale Programmable Output from 50 V to 200 V

- ▶ 32-channel, 14-bit denseDAC® with integrated high voltage output amplifier
- ▶ 15 mm × 15 mm CSP_BGA package
- ▶ Full-scale output voltage programmable from 50 V to 200 V via reference input
- ▶ 150 µA drive capability
- ▶ Integrated silicon diode for temperature monitoring
- ▶ 1.2 MHz channel update rate
- ▶ −10°C to +85°C operation

High Voltage DACs

Resolution		Voltage Output Range	Interface	1-Channel	4-Channel	32-Channel
Resolution	14-Bit	50 V to 200 V	SPI			■ AD45335
	12-Bit	30 V or 60 V	SPI	■ AD5501	■ AD5504	

■ Suggested part

Fast Precision DACs (>30 MSPS)

For test and measurement applications demanding both dc and ac performance, our fast precision DACs enable higher speed waveform generation of up to 12.5 MSPS with 4× oversampling with clean signal spectrums.

Featured Product:

AD3551R/AD3541R, ADM3552R/AD3542R: 1-/2-Channel, V_{OUT} DAC 1-/2-Channel, 16-/12-Bit Fast DAC

- ▶ Current Out, 5 mm × 5 mm QSPI package (AD3551R/AD3552R)
- ▶ Voltage Out, 4 mm × 4 mm LFCSP package (AD3541R/AD3542R)
- ▶ 100 ns settling time with 2 V step
- ▶ Unipolar and bipolar output ranges
- ▶ 16.5 MSPS/33 MSPS channel update rate
- ▶ −40°C to +105°C operation

Fast Precision DACs (>30 MSPS)

Resolution		Output Type	Interface	1-Channel Part Number	Speed (MSPS)	2-Channel Part Number	Speed (MSPS)
Resolution	16-Bit	Current steering	Parallel	■ LTC1668	50		
		Voltage		■ AD3541R	16.5	■ AD3542R	16.5
		Current steering		■ AD3551R	33	■ AD3552R	33
	14-Bit	Current steering	Parallel	■ LTC1667	50		
	12-Bit	Current steering	Parallel	■ LTC1666	50		

■ Suggested part

■ Lower glitch

4 mA to 20 mA Loop DACs

4 mA to 20 mA loop DACs are employed in process control and factory automation applications. Combined with ADI's family of HART® modems like the AD5700, the 4 mA to 20 mA converters can be used together to realize a robust, accurate, and HART Foundation registered solution.

Analog Devices' portfolio extends from the highly integrated AD5421, a loop-powered device that offers an internal regulator and output driver, to devices such as the AD5422/AD5412, offering voltage outputs with force/sense capability to ensure that the correct voltage is applied across the load, along with a compensation pin for driving large capacitive loads. The quad-channel AD5755-1 offers a unique dynamic power control mode to minimize power dissipation and improve thermal management in current mode.

4 mA to 20 mA Loop DACs

Resolution		Current Output Range (mA)	Interface	Voltage Output Range	1-Channel	4-Channel
Resolution	18-Bit	±2.5, ±25	SPI	±12.5 V, 12.5 V to 37.5 V	■ MAX22000 [1,5]	
	16-Bit	4 to 20, 0 to 20, 0 to 24	SPI	None	■ AD5420 [5], ■ AD5421 [2,5]	
					■ AD5422	
		4 to 20		0 V to 5 V, 0 V to 10 V, ±5 V, ±10 V	■ AD5423 [5], ■ AD5758 [3,5], ■ AD5753 [3,5], ■ ADFS5758 [3,4,6]	■ AD5755-1 [3,5]
	14-Bit	0 to 24	SPI	±10.5 V, ±12.6 V	■ AD5413 [5]	
		0 to 25	SPI	0 V to 12 V, ±12V	■ AD74115 [1], ■ AD74115H [1,5]	
	13-Bit	0 to 25	SPI	0 V to 11 V		■ AD74113R [1,5], ■ AD74112R [1]
	12-Bit	4 to 20, 0 to 20, 0 to 24	SPI	None	■ AD5410 [1]	
		4 to 20		0 V to 5 V, 0 V to 10 V, ±5 V, ±10 V	■ AD5412 [5]	
		0 to 25	SPI	0 V to 12.5 V,		■ MAX22007 [5]

■ Suggested part
[1] With Voltage, Current, Resistance Temperature Detector, and Thermocouple measurement capability thorugh Sigma Delta ADC
[2] Loop Powered
[3] With Dynamic Power Control
[4] Functional Safety Approved
[5] With HART Connectivity/Compatibility or with Integrated HART modem

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ADC/DAC Combos

Analog Devices' comprehensive portfolio of integrated monitoring and control components combine ADCs, DACs, temperature sensors, GPIOs, and current sensing technologies in a wide range of configurations. These integrated solutions save space over discrete implementations and provide greater versatility and configurability for applications requiring general system monitoring and control.

Featured Products:

AD5592R/AD5593R: 8-Channel, 12-Bit, Configurable ADC/DAC with On-Chip Reference

- 8-channel, configurable ADC/DAC/GPIO
- Configurable as any combination of
  - 8 × 12-bit DAC channels
  - 8 × 12-bit ADC channels
  - 8 × general-purpose digital input/output pins
- Integrated temperature sensor
- SPI (AD5592R) or I²C (AD5593R) interface
- Available in
  - 16-ball, 2 mm × 2 mm WLCSP
  - 16-lead, 3 mm × 3 mm LFCSP and TSSOP

ADC/DAC Combos

Resolution		Output Type	Interface	4-Channel		8-Channel		12-Channel		16-Channel		20-Channel	
				Part Number	# of ADC Channels	Part Number	# of ADC Channels	Part Number	# of ADC Channels	Part Number	# of ADC Channels	Part Number	# of ADC Channels
12-Bit		Bipolar	SPI			■ AD7293	4						
		Unipolar single supply	SPI			■ AD5592R	8	■ MAX11311	12	■ AD5590	16	■ MAX11300	20
			I²C	■ AD7294-2	2	■ AD5593R	8	■ MAX11312	12			■ MAX11301	20
				■ AD7294	4								
10-Bit		Unipolar single supply	SPI	■ AD7292	8								

■ Suggested part

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