



ADC541/542

Data Converter Line

8-Bit, Wide Temperature 2.5µS ADCs

FEATURES

- 2.5µs conversion time
- Low Power: 650mW
- Wide temperature range models: -55°C to +125°C operation
- MIL-STD-883 or commercial/industrial processing
- Plug-in replacements for ADC82

DESCRIPTION

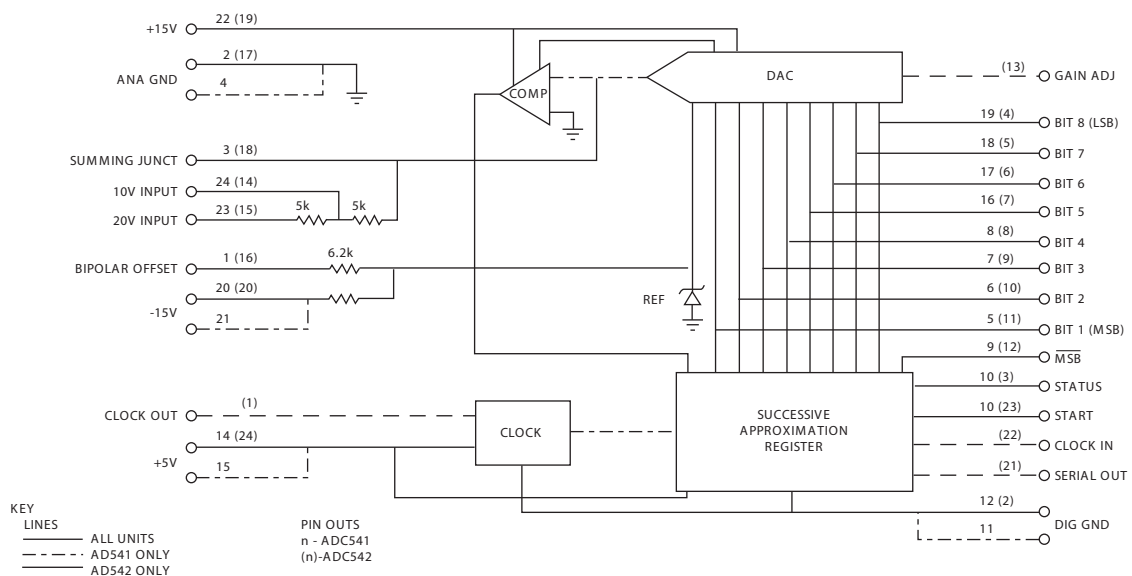
The ADC541/542 Series are fast, low power, hybrid IC analog-to-digital converters (ADCs). The series features 8-bit resolution and accuracy with 2.5µs typical conversion time. The lower power drain of 650 mW is from standard ±15 VDC and +5VDC power supplies. All models are hermetically seated in 24-pin DIP style packages and are complete with precision thin-film DAC, clock, comparator reference and successive approximation register.

The ADC541C-8 and ADC542C-8 are processed to commercial/industrial standards and operate -25°C to +85°C. ADC541B-8 and ADC542B-8 are processed to MIL-STD-883 Rev.C, Level B requirements, and operate -55°C to +125°C. In addition, the ADC542 versions are plug-in replacements for the ADC82.

All models can be externally pin-connected for 3 unipolar and 3 bipolar input ranges. Output coding in the bipolar mode is user selectable as either offset binary or 2's complement. ADC541/542 feature an overall temperature coefficient of ± 45 ppm/°C and long-term stability if 0.1% /year.

ADC541/542 models provide systems designers with greater flexibility savings in space and weight and the ultimate in reliability. Their compact size, 8-bit resolution, accuracy an extensive self-contained features are particularly well suited to microprocessor applications.

FUNCTIONAL DIAGRAM



ADC541/542

SPECIFICATIONS

(Typical @ +25°C and nominal power supplies unless otherwise noted)

SERIES	ADC541/542
RESOLUTION	8-Bits
TYPE	Successive Approximation
ANALOG INPUT	
Unipolar	0 to +5V, 0 to +10V, 0 to +20V
Bipolar	±2.5V, ±5V, ±10V
Impedance	500 Ω /Volt
DIGITAL INPUTS	
Start Command Pulse Input	100nS wide, min Logic "1" > +2.0V; Logic "0" < +0.8
Logic Loading	2 TTL Loads
Clock in (ADC542 only)	2 TTL Loads
DIGITAL OUTPUTS	
Data Coding, ADC541	Parallel Outputs Only
Unipolar	Binary
Bipolar	2's Complimentary Offset Binary
Data Coding, ADC542	Parallel and Serial Output
Unipolar	Complimentary Binary
Bipolar	Complimentary Offset Binary
Data Output Drive Capability	Complimentary 2's Complement 3TTL Loads Logic "1" > +2.4V Logic "0" > 0.4V
Status Output Drive Capability	2 TTL Loads, Logic "1" during conversion
Clock Out (ADC542 only)	
Frequency	2.85 MHz
REFERENCE	Internal
CONVERSION TIME/ THROUGHPUT RATE	2.5 μ S, typ; 2.8 μ S max/400 kHz
ACCURACY	
Quantization	±1/2 LSB max
Linearity	±0.2% of F.S.R. max
Offset,	
Unipolar and Bipolar ¹	±0.2% of F.S.R. max
Gain ¹	±0.2% of F.S.R. max
STABILITY	
Over Specified Temperature Range	
Linearity	±10ppm/°C
Gain	±40ppm/°C
Offset	±10ppm/°C
Transfer Accuracy ²	±45ppm/°C
Long Term	±0.1%/year @ +25°C
POWER SUPPLY	
Requirements	
+15V ±3%	20mA max
-15V ±3%	12mA max
+5V ±5%	105mA max
Rejection Ratio	0.05%/° (+15V); 0.01%/° (-15V)
Power Consumption	1W max
TEMPERATURE RANGE	
Specified	
ADC541C/542C	0° to 70°C
ADC541B/542B	-55°C to +125°C
Storage, All Models	-65°C to +150°C
MECHANICAL	
Case Style	Case A (ceramic): ADC542
Case Envelope Dimensions	Case B (metal): ADC541

Consult factory for application information.



Pin Assignment

ADC541

PIN	FUNCTION	PIN	FUNCTION
1	BIPOLAR OFFSET	24	+10V INPUT
2	ANALOG GND	23	+20V INPUT
3	SUMMING JCT.	22	+15V
4	ANALOG GND	21	-15V
5	BIT 1 (MSB)	20	-15V
6	BIT 2	19	BIT 8 (LSB)
7	BIT 3	18	BIT 7
8	BIT 4	17	BIT 6
9	BIT 1 (MSB)	16	BIT 5
10	STATUS	15	+5V
11	DIGITAL GND	14	+5V
12	DIGITAL GND	13	START

ADC542

PIN	FUNCTION	PIN	FUNCTION
1	CLOCK OUT	24	+5V
2	DIGITAL GND	23	SRART
3	STATUS	22	CLOCK IN
4	Bit 8 (LSB)	21	SERIAL OUT
5	Bit 7	20	-15V
6	Bit 6	19	15V
7	Bit 5	18	SUMMING JCT
8	Bit 4	17	ANALOG GND
9	Bit 3	16	BIPOLAR OFFSET
10	Bit 2	15	20V INPUT
11	Bit 1 (MSB)	14	10V INPUT
12	Bit 1 (MSB)	13	GAIN ADJUST

NOTES

1. Initial offset and gain errors are externally adjustable. See APPLICATIONS INFORMATION.
2. Includes effects of Linearity, offset, and gain errors.

ORDERING INFORMATION

MODEL	DESCRIPTION
ADC541C-8	Commercial/Industrial Process
ADC541B-8	MIL-STD-883 Rev. C, Level B Process;
ADC542C-8	Commercial/Industrial Process
	ADC82 Pin Out Compat.
ADC542B-8	MIL-STD-883 Rev. C, Level B Process;
	ADC82 Pin Out Compat.

Specifications subject to change without notice.

