

DAC336-12

12-Bit Storage Register DACs

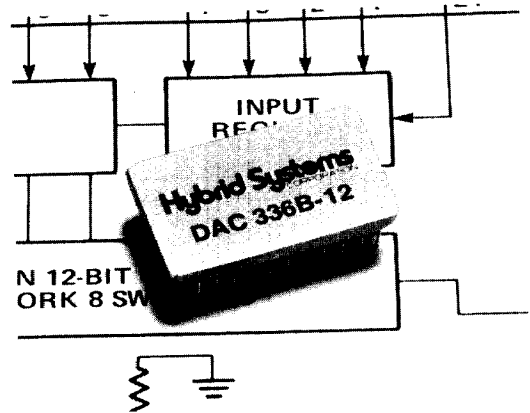
FEATURES

- Input Storage Register
- Compact and Complete
 Contains reference, ladder network, switches, output amplifier and input register in a 24 pin DIP style package.
- Very Low Power . . . 300mW typical
- Operates -55° C to +125° C
- MIL or Comm./Indust. Processing

DESCRIPTION

DAC336-12 models are easy to use because they're so complete. They're ideal for microprocessor applications. Each DAC336-12 operates reference, ladder network, switches, output amplifier and input register on just 300 mW, typical; and all in a 24 pin package.

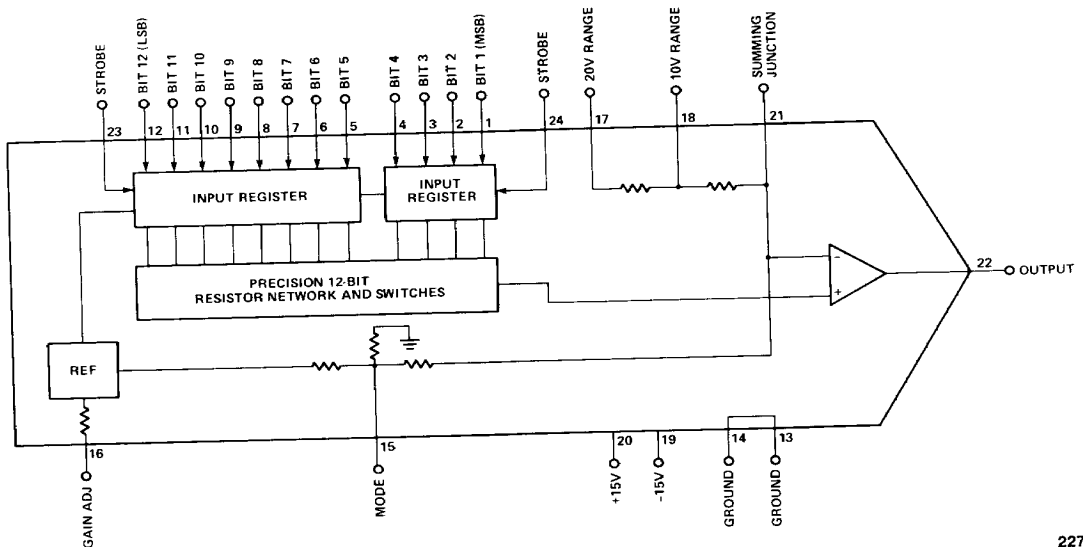
DAC336-12's input register is both 8-Bit bus and 12-Bit bus compatible. Strobe input pins 23 and 24 can be operated independently to enter 8 bits and 4 bits of data respectively or both pins can be operated simultaneously when operating from 12 bit or larger data bus. Data is held in the register when the Strobe inputs are low. When Strobe inputs are high, the input register is "transparent" and the analog output follows the digital inputs.



At the heart of the DAC336-12 is a laser-trimmed, low drift, thin-film nichrome network. The units accept TTL/DTL and 5V CMOS logic levels and deliver a minimum of 5 mA at $\pm 10V$ out. Simple pin jumpering allows the user output choices of either $\pm 10V$ or 0 to $+10V$.

Two DAC336-12 models are available: DAC336C-12 for commercial/industrial uses; DAC336B-12 where MIL-STD-883 Rev. C, Level B processing is required.

FUNCTIONAL DIAGRAM



SPECIFICATIONS

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

SERIES	DAC336-12
TYPE	Latched, Fixed Ref., Volt. Output
RESOLUTION	12 Bits
DIGITAL INPUTS	
Logic Compatibility ¹	TTL, DTL, CMOS
Input Current	1 μ A (max)
Coding	Unipolar Binary Bipolar Offset Binary
Strobe Width ²	140ns (min)
Data Set Up Time ³	50ns (min)
ANALOG OUTPUT	
Scale Factor ⁴	$\pm 0.2\%$ F.S.R. (max)
Initial Offset ⁴	$\pm 0.2\%$ F.S.R. (max)
Output Ranges ⁵	0 to +10V, $\pm 10V$
Output Current Capability	5mA (min)
Output Impedance	0.2 Ω
REFERENCE	Internal

STATIC PERFORMANCE	
Integral Linearity (best straight line)	$\pm 0.03\%$ F.S.R. (max)
Differential Linearity	± 1 LSB (max)

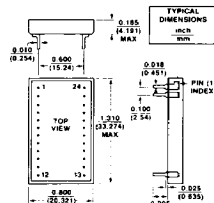
DYNAMIC PERFORMANCE	
Maximum Settling Time	
10V Change	5 μ s
20V Change	10 μ s
Slew Rate	10V/ μ s

STABILITY	
Differential Linearity	
0 to +70°C	± 2 ppm/ $^{\circ}$ C of F.S.R. (max)
-55°C to +125°C	± 5 ppm/ $^{\circ}$ C of F.S.R. (max)
Scale Factor (Gain)	
0 to +70°C	± 20 ppm/ $^{\circ}$ C of F.S.R. (max)
-55°C to +125°C	± 30 ppm/ $^{\circ}$ C of F.S.R. (max)
Offset	
0 to +70°C	± 20 ppm/ $^{\circ}$ C of F.S.R. (max)
-55°C to +125°C	± 30 ppm/ $^{\circ}$ C of F.S.R. (max)
Total Transfer Accuracy ⁶	
0 to +70°C	30ppm/ $^{\circ}$ C
-55°C to +125°C	40ppm/ $^{\circ}$ C

POWER SUPPLY⁷	
Requirements	
+15V	+11.0V to +18.0V @ 10mA (max)
-15V	-11.0V to -18.0V @ 25mA (max)
Rejection Ratio	0.001%/V _s

TEMPERATURE RANGE	
Operating	-55°C to +125°C B version
Storage	0°C to +70°C C version

MECHANICAL	
Case Style	24-pin ceramic

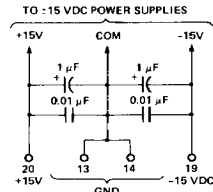


PIN	FUNCTION	PIN	FUNCTION
1	BIT 1 (MSB)	24	STROBE BIT 1,4
2	BIT 2	23	STROBE BIT 5,12
3	BIT 3	22	OUTPUT
4	BIT 4	21	SUMMING JUNCTION
5	BIT 5	20	+15V
6	BIT 6	19	-15V
7	BIT 7	18	10V RANGE
8	BIT 8	17	20V RANGE
9	BIT 9	16	GAIN ADJUST
10	BIT 10	15	MODE
11	BIT 11	14	GROUND
12	BIT 12 (LSB)	13	GROUND

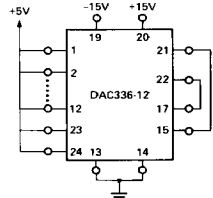
- NOTES:**
- 5V CMOS, 2.5V (nom.) threshold. Logic 1 > 3.5V (min), Logic 0 < 0.8V (max).
 - Strobe input load is 2 CMOS inputs.
 - Time data must be stable before Strobe goes to "0".
 - Adjustable to zero...see APPLICATIONS INFORMATION.
 - Pin programmable...see APPLICATIONS INFORMATION.
 - Includes gain, zero, and linearity errors.
 - Supply voltages must be at least 3.5V above maximum output voltage.
 - In case of discrepancy between package shown in photograph and package outline dimension, the mechanical outline is correct.

APPLICATIONS INFORMATION

RECOMMENDED POWER SUPPLY BYPASS CIRCUIT



RECOMMENDED BURN-IN CIRCUIT (Standard for MIL-STD-883 Models)



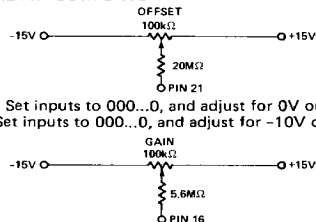
GAIN SCALING

Output Voltage Range	Connect Pin 15 to	Connect Pin 22 to
0 to +10V $\pm 10V$	Gnd 21	18 17

STROBE LOGIC

Strobe	Function
0	data latched (held)
1	data changing (transfer)

OPTIONAL ADJUSTMENTS*



Unipolar - Set inputs to 000...0, and adjust for 0V output.
Bipolar - Set inputs to 000...0, and adjust for -10V output.

Unipolar - Set inputs to 111...1, and adjust for +10V output.
Bipolar - Same as above.

*Allow for swing of $\pm 0.5\%$ minimum.

TRANSFER CHARACTERISTICS

DIGITAL INPUT CODE	UNIPOLAR		BIPOLAR	
	OUTPUT WEIGHTING	OUTPUT VOLTAGE	OUTPUT WEIGHTING	OUTPUT VOLTAGE
1 1 1 ... 1	(F.S. -1 LSB)	+9.9975V	(F.S. -1 LSB)	+9.995V
1 0 0 ... 0	F.S./2	+5.000V	ZERO	0 Volts
0 0 0 ... 0	ZERO	0 Volts	-F.S.	-10.000V

CAUTION: ESD (Electro-Static Discharge) sensitive device. Permanent damage may occur when unconnected devices are subjected to high energy electrostatic fields. Unless otherwise noted, the voltage at any digital input should never exceed the supply voltage by more than 0.5 volts or go below -0.5 volts. Power supply should come up before, or at the same time, as the digital input supply.

ORDERING INFORMATION

MODEL	PROCESSING
DAC336C-12	Commercial/Industrial
DAC336B-12	Per MIL-STD-883 Rev. C, Level B

Specifications subject to change without notice.

