

# DAC336-12

## 12-Bit Storage Register DACs

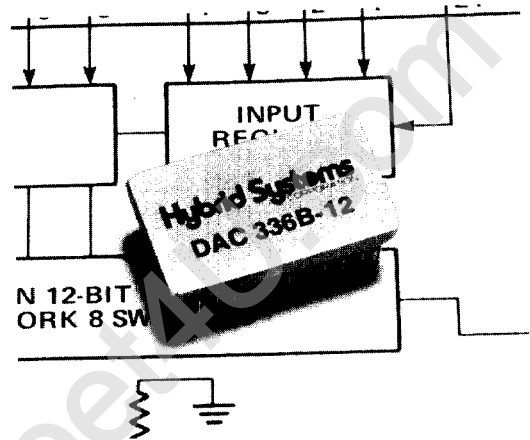
### FEATURES

- Input Storage Register
- Compact and Complete  
Contains reference, ladder network, switches, output amplifier, and input storage 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.

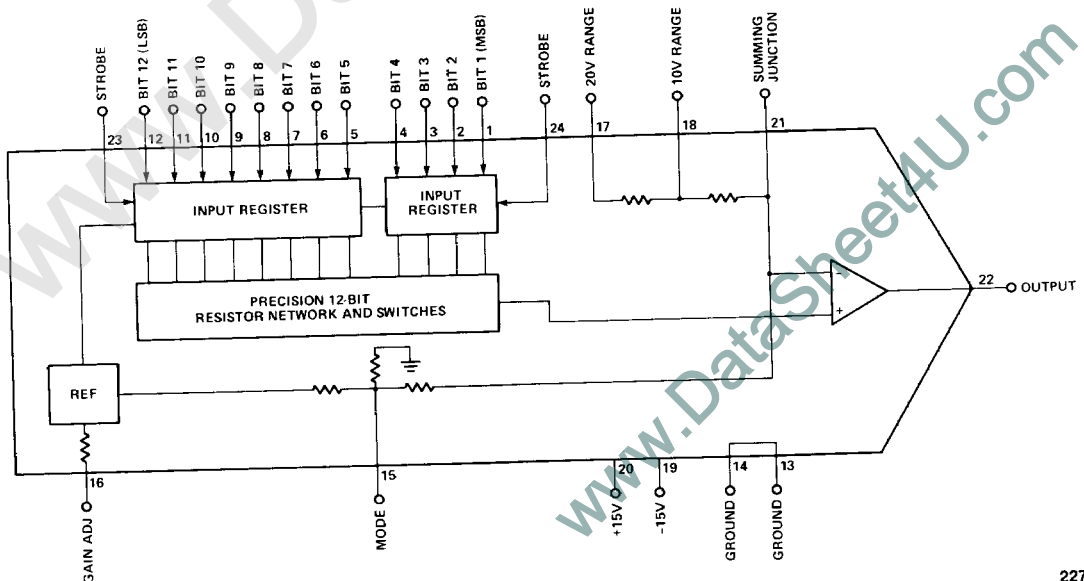
DAC336-12's input register is both 8-Bit bus and 12-Bit bus compatible. Strobe input pins 23 and 24 can be operated independently to enter 8 bits and 4 bits of data respectively or both pins can be operated simultaneously when operating from 12 bit or larger data bus. Data is held in the register when 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.

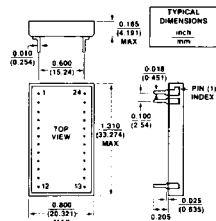
### FUNCTIONAL DIAGRAM



# SPECIFICATIONS

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

<b>SERIES</b>	<b>DAC336-12</b>
<b>TYPE</b>	Latched, Fixed Ref., Volt. Output
<b>RESOLUTION</b>	12 Bits
<b>DIGITAL INPUTS</b>	
Logic Compatibility <sup>1</sup>	TTL, DTL, CMOS
Input Current	1 μA (max)
Coding	
Unipolar	Binary
Bipolar	Offset Binary
Strobe Width <sup>2</sup>	140nS (min)
Data Set Up Time <sup>3</sup>	50nS (min)
<b>ANALOG OUTPUT</b>	
Scale Factor <sup>4</sup>	±0.2% F.S.R. (max)
Initial Offset <sup>4</sup>	±0.2% F.S.R. (max)
Output Ranges <sup>5</sup>	0 to +10V, ±10V
Output Current Capability	5mA (min)
Output Impedance	0.2Ω
<b>REFERENCE</b>	Internal
<b>STATIC PERFORMANCE</b>	
Integral Linearity (best straight line)	±0.03% F.S.R. (max)
Differential Linearity	±1 LSB (max)
<b>DYNAMIC PERFORMANCE</b>	
Maximum Settling Time	
10V Change	5μS
20V Change	10μS
Slew Rate	10V/μS
<b>STABILITY</b>	
Differential Linearity	
0 to +70°C	±2ppm/°C of F.S.R. (max)
-55°C to +125°C	±5ppm/°C of F.S.R. (max)
Scale Factor (Gain)	
0 to +70°C	±20ppm/°C of F.S.R. (max)
-55°C to +125°C	±30ppm/°C of F.S.R. (max)
Offset	
0 to +70°C	±20ppm/°C of F.S.R. (max)
-55°C to +125°C	±30ppm/°C of F.S.R. (max)
Total Transfer Accuracy <sup>6</sup>	
0 to +70°C	30ppm/°C
-55°C to +125°C	40ppm/°C
<b>POWER SUPPLY<sup>7</sup></b>	
Requirements	
+15V	+11.0V to +18.0V @ 10mA (max)
-15V	-11.0V to -18.0V @ 25mA (max)
Rejection Ratio	0.001%/V <sub>S</sub>
<b>TEMPERATURE RANGE</b>	
Operating	-55°C to +125°C B version
Storage	0°C to +70°C C version
<b>MECHANICAL</b>	
Case Style	24-pin ceramic

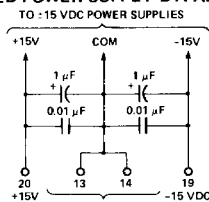


### NOTES:

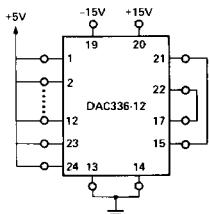
- 5V CMOS, 2.5V (nom.) threshold. Logic 1 > 3.5V (min), Logic 0 < 0.8V (max).
- Strobe input load is 2 CMOS inputs.
- Time data must be stable before Strobe goes to '0'.
- Adjustable to zero...see APPLICATIONS INFORMATION.
- Pin programmable...see APPLICATIONS INFORMATION.
- Includes gain, zero, and 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)



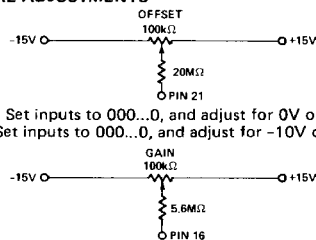
## GAIN SCALING

Output Voltage Range	Connect Pin 15 to	Connect Pin 22 to
0 to +10V ±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 ±0.5% minimum.

## TRANSFER CHARACTERISTICS

DIGITAL	UNIPOLAR	BIPOLAR		
INPUT CODE	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.

