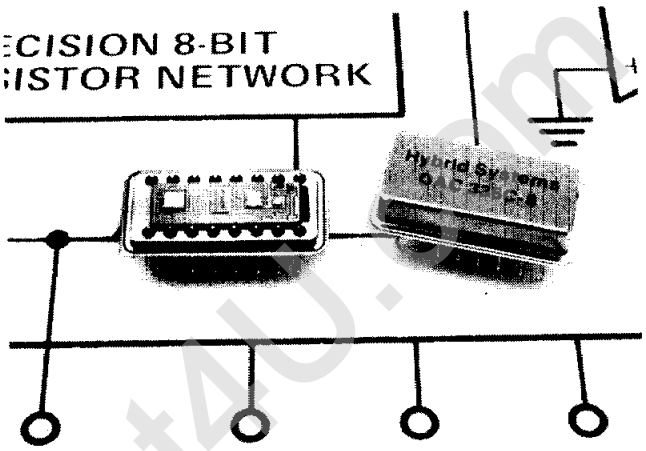
Sipex Corporation
SIGNAL PROCESSING EXCELLENCE

DAC336-8
8-Bit Storage Register DACs

FEATURES

- Input Storage Register
- Compact and Complete
  Contains reference, ladder network, switches output amplifier, and input storage register in a 16-pin package
- Adjustment-Free
- Accurate to ±1/8 LSB (typ)
- Very Low Power . . . 150mW (typ)
- -55° C To +125° C Operation



DESCRIPTION

The DAC336-8 includes a precision voltage reference, resistor ladder network, switches, output amplifier, and the input storage register. The reduced need for external circuitry lowers cost and improves reliability in microcomputer based process control and other applications.

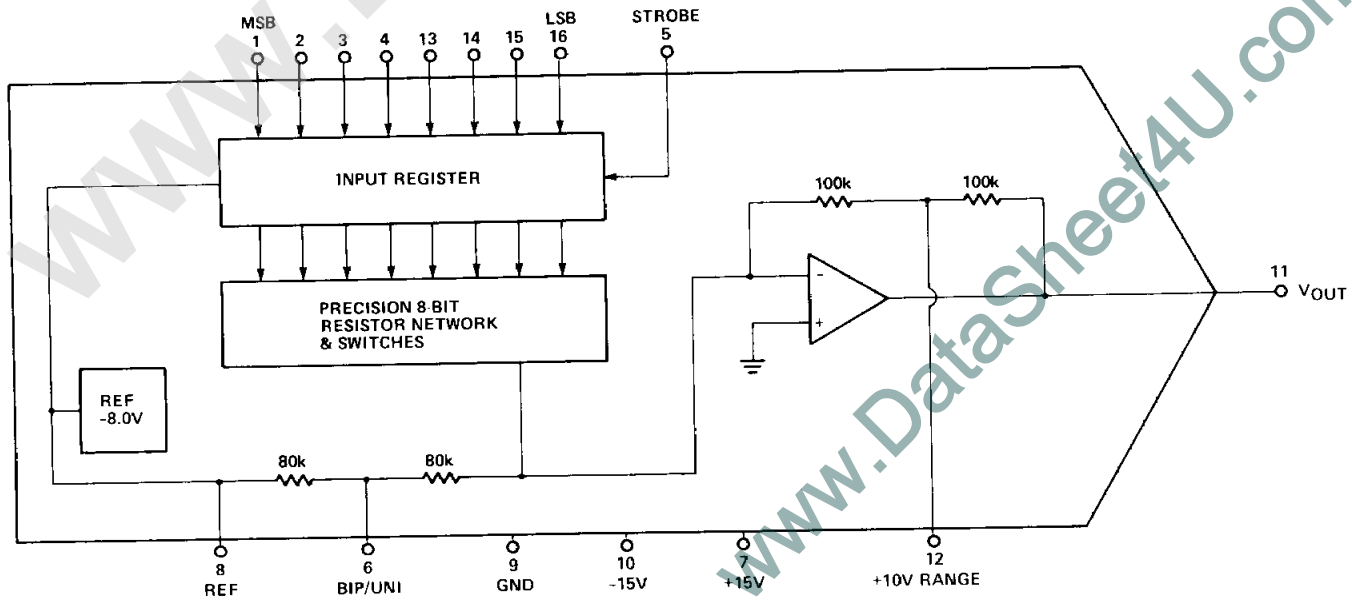
There is no need to add external adjustment potentiometers or expensive capacitors to the DAC336-8. It is factory pre-trimmed to ±0.05%...four times the accuracy normally associated with 8-Bit DACs. And simple pin jumpering allows a choice of four voltage range outputs: 0 to +10V, 0 to −10V, ±5V, ±10V.

The STROBE input (Pin 5) controls the data flow to the DAC336-8 latches (storage register). When the STROBE is low, data in the register is held. When the STROBE is high, the input register is "transparent" and the analog output follows the digital input.

The heart of the DAC336-8 is a laser-trimmed low drift thin-film nichrome resistor network. Low power consumption, typically 150 mW, is featured in the design. DAC336-8 will accept TTL, DTL, and 5V CMOS logic levels and will deliver a minimum of 5 mA @ ±10V output.

The features, accuracy, simplicity, and quality built into DAC336-8 are a result of Hybrid Systems' many years of experience in the converter field. Two DAC336-8 models are available: DAC336C-8 for commercial/industrial uses; DAC336B-8 where MIL-STD-883 Rev. C, Level B processing is required.

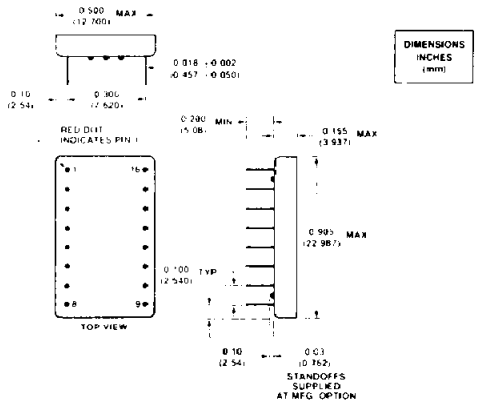
FUNCTIONAL DIAGRAM



SPECIFICATIONS

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

MODEL	DAC336-8
TYPE	Latched, Fixed Reference, Voltage Output
RESOLUTION	8 Bits
DIGITAL INPUTS	
Logic Compatibility[1]	TTL/DTL, CMOS
Input Current	1 μA (max)
Input Codes	
Unipolar Positive	Complementary Binary
Unipolar Negative	Binary
Bipolar	Complementary Offset Binary
Strobe Width[2]	140nS (min)
Data Set Up Time[3]	50nS (min)
ANALOG OUTPUT	
Scale Factor (Gain)[4]	±0.05% FSR, ±0.2% FSR (max)
Initial Offset[4]	±0.05% FSR, ±0.2% FSR (max)
Output Ranges[5]	
Unipolar	0 to -10V, 0 to +10V
Bipolar	±5V, ±10V
Output Current Capability	5mA (min)
Output Impedance	≤1Ω
REFERENCE[6]	Internal -8.0 VDC
STATIC PERFORMANCE	
Integral Linearity	± ⅛LSB (typ), ± ½LSB (max)
Differential Linearity	±½LSB typ; ±1 LSB (max)
DYNAMIC PERFORMANCE	
Settling Time to 0.2% FSR[7]	
For a 1 LSB Change	4μS (max)
Slew Rate	0.5V/μS
STABILITY	
Differential Linearity	
0°C to +70°C	±15 ppm of FSR/°C, ±25 ppm of FSR/°C (max)
-55°C to +125°C	±15 ppm of FSR/°C
Scale Factor (Gain)	
0°C to +70°C	±20 ppm of FSR/°C, ±30 ppm of FSR/°C (max)
-55°C to +125°C	±20 ppm of FSR/°C
Offset	
0°C to +70°C	±20 ppm of FSR/°C, ±30 ppm of FSR/°C (max)
-55°C to +125°C	±20 ppm of FSR/°C
Total Transfer Accuracy[8]	
0°C to +70°C	±30 ppm of FSR/°C, ±50 ppm of FSR/°C (max)
-55°C to +125°C	±50 ppm of FSR/°C
POWER SUPPLY[9]	
Requirements	
+15V	+11.0V to +18.0V @ 3.5mA, 6mA (max)
-15V	-11.0V to -18.0V @ 6.5mA, 12mA (max)
Rejection Ratio	
+15V	0.005% FSR/%Vs (max)
-15V	0.005% FSR/%Vs (max)
TEMPERATURE RANGE	
Operating	-55°C to +125°C B Version
Storage	0°C to +70°C C Version
MECHANICAL	
Case Style	Metal



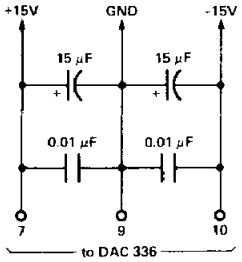
Pin Assignments

PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	BIT 1 (MSB)	16	BIT 8 (LSB)
2	BIT 2	15	BIT 7
3	BIT 3	14	BIT 6
4	BIT 4	13	BIT 5
5	STROBE	12	+10V RANGE
6	BIPOLAR OFFSET	11	OUTPUT
7	+15V	10	-15V
8	REF OUT	9	GND

NOTES:
1. 5V CMOS, 2.5V (nom.) threshold.
   Logic 1 > 3.5V (min).
   Logic 0 < 0.8V (max).
2. Strobe input load is 2 CMOS inputs.
3. Time data must be stable before Strobe goes to "0".
4. Initially pre-trimmed, no adjustment necessary.
5. User pin programmable, see Gain Scaling Table.
6. User accessible, 5 mA (min).
7. Worst case for 20V range is 45 μs, and 25 μs for 10V range.
8. Includes gain, zero, and linearity errors.
9. Supply voltages must be at least 2.5V above maximum output voltage.
10. 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



STROBE LOGIC

STROBE	FUNCTION
0	data latched (held)
1	data changing (transfer)

TRANSFER CHARACTERISTICS

Digital Input Code	Analog Output			
	Unipolar		Bipolar	
	+10V	-10V	±10V	±5V
0 0 0 0 0 0 0 0	+9.961	0.000	+10.000	+5.000
0 0 0 0 0 0 0 1	+9.922	-0.039	+9.922	+4.961
0 1 1 1 1 1 1 1	+5.000	-4.961	+0.078	+0.039
1 0 0 0 0 0 0 0	+4.961	-5.000	0.000	0.000
1 1 1 1 1 1 1 0	+0.039	-9.922	-9.843	-4.922
1 1 1 1 1 1 1 1	0.000	-9.961	-9.921	4.961

GAIN SCALING TABLE

OUTPUT VOLTAGE RANGE	CONNECT PIN 6 TO	CONNECT PIN 11 TO	CODING
0 to + 10V	8	12	Comp. Bin
0 to - 10V	Gnd	12	Bin
±5V	NC	12	Comp. Off. Bin.
±10V	NC	NC	Comp. Off. Bin.
Note: NC means no connection			

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	APPLICATION
DAC336C-8	Commercial/Industrial
DAC336B-8	Per Mil-STD-883 Rev. C, Level B

Specifications subject to change without notice.