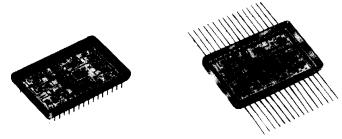
14 BIT DEGLITCHED D/A CONVERTER 10MHz Update Rate; Voltage Output



DAC-02310

DAC-02311

DESCRIPTION:

The DAC-02310 is a 14 bit, 10 MHz update rate, deglitched hybrid D/A converter with a low impedance voltage output. Its input registers, precision DC voltage reference and track/hold deglitcher output provide the complete solution to low noise DAC requirements. Packaged in a small 32 pin TDIP hybrid, the DAC-02310 operates over the full -55°C to +125°C temperature range and is available with military processing.

DAC-02310 is available in linearity grades of 13 bits (±0.006%) and 12 bits

(\pm 0.012%). It can be pin programmed for 5 different output voltage ranges; and offset, gain, and pedestal errors can be trimmed to zero with external potentiometers.

With its 14 bit resolution, low glitch voltage output and small hermetic package, the DAC-02310 is ideal for the most demanding low noise DAC requirements. It is particularly well suited for applications such as vector-stroke CRT displays, waveform generators and automatic test equipment.

FEATURES

- FULL FUNCTION: INCLUDES INPUT REGISTERS AND TRACK/HOLD DEGLITCHER OUTPUT
- HIGH SPEED: 10MHz UPDATE RATE FOR SMALL STEP CHANGES
- LOW GLITCH: 10mVpp GLITCH VOLTAGE
- SMALL SIZE: 32 PIN TDIP HYBRID
- WIDE OPERATING TEMPERATURE: -55°C to +125°C

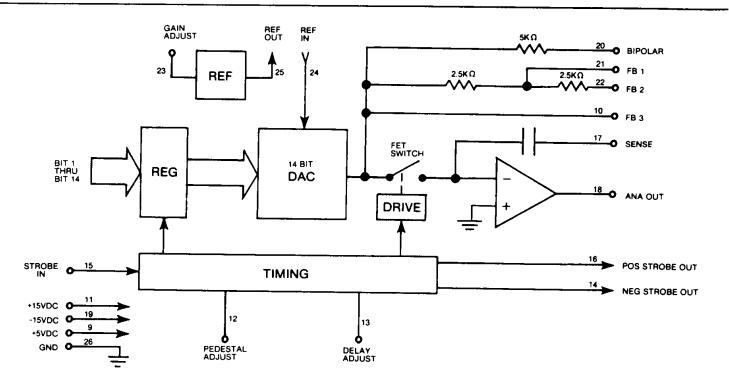


FIGURE 1. DAC-02310 BLOCK DIAGRAM

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TABLE 1. DAC-02310 AND DAC-02311 SPECIFICATIONS
Typical values at +25° and nominal power supply voltages
unless otherwise specified.

PARAMETER	Typical values at +25° and nominal power supply voltages unless otherwise specified.				
RESOLUTION		 			
ACCURACY					
Linearity Error Cain Error (1) Sain Tempoo Sain Error (1) Sain Tempoo Coffset Error (1) Offset Error (1) Offset Error (1) Offset Error (1) Offset Error (1) Podestal Tempoo Podestal Tempoo Podestal Tempoo (2) Podes	RESOLUTION	Bits	14	14	
Linearity Tempco Gain Error(1) Gain Tempco Offset Error(1) Edgain Tempco Offset Error(1) Offset Error(1) Offset Error(1) Offset Error(1) Pedestal Tempco OpmFSR/°C 20 max ±25 max ±20 max ±10	ACCURACY				
Gain Error (1) Gain Tempco Gain Tempco Coffset Error (1) Coffset Error (1) Coffset Error (1) Coffset Tempco Pedestal Error (1) PmFSR/°C 20 max 20 max ±10 ±20 pmFSR/°C 20 max ±20 pmFSR/°C 20		% FSR	±0.006 max	±0.012 max	
Gain Tempco Offset Error(1)		1 ' '			
Offset Error (1) MV ± 10 ± 20 Pedestal Error (1) pedestal Error (1) mV ± 10 ± 20 Pedestal Tempco (2) mV ± 10 ± 20 Monotonicity mV ± 10 ± 20 DVNAMIC Bits 13 12 CHARACTERISTICS Settling Time to ± ½ 0.01% FSR ± ½ 10 ½ 50 1.8 max ± ½ 0.01% FSR ± 10V Full Scale Change µsec 1.1 max ± 2.5V Full Scale Change µsec 1.6 max ± 20 to 7 1.7 max 20 to 7.0 max Trimate Change µsec 1.7 max ± 20 to 7 1.7 max 1.7 max ± 20 to				1 ' '	
Offset Tempco pedestal Error (1) pedestal Error (1) ±20 mv ±20 max ±20 max ±20 pmFSR/°C 10			l .		
Pedestal Tempco (2) Monotonicity DYNAMIC 10 13 12					
Monotonicity			1		
DYNAMIC CHARACTERISTICS Settling Time to ±½0.01% FSR ±10V Full Scale Change ±2.5V Full Scale Change 1 LSB Change 3 LSB Change Slew Rate Glitch (3) Voltage Energy (7) DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level Logic "0" Level V +2.0 to 5 Oto +0.8 1 standard LS TTL loads 10 min ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Output Current (6) Input Voltage Input Impedance Max Voltage V +18 max Current Drain -15V Supply Tolerance Max Voltage Current D	, , ,	1) '	!	
CHARACTERISTICS Settling Time to ±½ 0.01% FSR ±10V Full Scale Change ±2.5V Full Scale		BITS	13	12	
Settling Time to	=	ļ			
## 10V Full Scale Change ## 25V Full Scale Change ## 250 function for the function function for the function		ĺ			
## ±5V Full Scale Change ±2.5V Full Scale Change 1 LSB Change Slew Rate Glitch (3) Voltage Energy (7) DIGITAL INPUTS Logic Compability Data Inputs Logic "0" Level V +2.0 to +5 Logic "0" Level V +2.0 to 5 Current Load Input (4) Input Voltage Ranges (5) Current Load Impedance Ω 0.1 max REFERENCE Output Voltage V -10 ±0.1 Input Voltage Number Supplies +15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage V -18 max -15V Supply Tolerance Max Voltage V -15.5 max -15V Supply Tolerance Max Vol				l	
## ±2.5V Full Scale Change 1 LSB Change Slew Rate Glitch (3) Voltage Fenergy (7) ## DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level V +2.0 to +5 Logic "0" Level V 0 to +0.8 Loading Coding (negative output) Strobe Input (4) Logic "1" Level V +2.0 to 5 Logic "1" Level V 0 to +0.8 Loading Coding (negative output) Strobe Input (4) Logic "1" Level V +2.0 to 5 Logic "0" Level V 0 to +0.8 Loading Width nsec 10 min ### ANALOG OUTPUT ### Voltage Ranges (5) Current Load MA ±5 max Impedance MA ±5 max Impedance MA ±1 max Impedance MA ±1 max Input Voltage V -10 ±0.1 Input Voltage V 0 to -10 Input Impedance MA ±1 max Input Voltage V 18 max Current Drain MA 40 typ 50 max -15V Supply Tolerance MA Voltage V -18 max Current Drain MA 25 typ 35 max #### For Name And Step Step Step Step Step Step Step Step					
Sew Rate Glitch (3) Voltage Energy (7) DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level Loading Coding (negative output) Strobe Input (4) Logic "1" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Output Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain -5V	•				
Slew Rate Glitch (3) Voltage Energy (7) DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level Logic "0" Level Loading Coding (negative output) Strobe Input (4) Logic "1" Level Logic "0" Level Logi		,			
Glitch (3) Voltage Energy (7) DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level Logic "0" Level Logic "0" Level Logic "0" Level V 0 to +0.8 1 standard LS TTL load Coding (negative output) Strobe Input (4) Logic "1" Level Logic "0" Level V 0 to +0.8 2 standard S TTL loads 2 standard S TTL loads 1 to min ANALOG OUTPUT Voltage Ranges (5) V ±10, ±5, ±2.5, 0 to -10 0 to -5 Current Load Impedance Output Voltage Output Voltage Output Voltage Input Impedance Max Voltage Input Impedance Max Voltage V 10 to -10 Input Impedance Max Voltage V 118 max Current Drain -15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage V -18 max -5V Supply Tolerance Max Voltage V -10 ±0.1 0 to -5 0 to +0.8 1 to 40.0 1 to +0.8 1 to 40.0 1 to +0.8 1 to 40.0 1 to			1	п	
Voltage Energy (7) mV+nsec 250 typ 750 max DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level V +2.0 to +5 Loading Coding (negative output) Strobe Input (4) Logic "1" Level V +2.0 to 5 Logic "0" Level V 0 to +0.8 Loading Coding (negative output) Strobe Input (4) Logic "1" Level V +2.0 to 5 Logic "0" Level V 0 to +0.8 Loading Width nsec 10 min ANALOG OUTPUT Voltage Ranges (5) V ±10, ±5, ±2.5, 0 to −10 0 to −5 Current Load mA ±5 max Impedance Ω 0.1 max REFERENCE Output Voltage V −10 ±0.1 Input Voltage V 0 to −10 Input Impedance Ω 3.3K POWER SUPPLIES +15V Supply Tolerance Max Voltage V −18 max Current Drain MA 25 typ 35 max +5V Supply Tolerance Max Voltage V −18 max Current Drain MA 25 typ 35 max +5V Supply Tolerance Max Voltage V −18 max Current Drain MA 25 typ 35 max Tolerance Max Voltage V −5.5 max Current Drain MA 30 typ 45 max TEMPERATURE RANGE Operating (Case)			,, 10 ////		
DIGITAL INPUTS Logic Compability Data Inputs Logic "1" Level V +2.0 to +5 Logic "0" Level V 0 to +0.8 1 standard LS TTL load Coding (negative output) Coffset Binary (Bipolar) Binary (Unipolar)	Voltage				
Logic Compability Data Inputs Logic "1" Level Logic "0" Level Loading Coding (negative output) Strobe Input (4) Logic "1" Level Loading Coding ("1" Level Logic "0" Level Logic "0" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Max Voltage Current Drain -5V Supply Tolerance Max Voltage Curre	Energy (7)	mV•nsec	250 typ 750	max	
Data Inputs Logic "1" Level Logic "0" Level Loading Coding (negative output) Strobe Input (4) Logic "1" Level Logic "1" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Output Current (6) Input Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage M					
Logic "1" Level Logic "0" Level Loading			TTL		
Logic "0" Level Loading Coding (negative output) Strobe Input (4) Logic "1" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Input Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Max	Logic "1" Level	l v	+20 to +5		
Loading Coding (negative output) Strobe Input (4) Logic "1" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Input Impedance Max Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage	Logic "0" Level				
Offset Binary (Bipolar) Binary (Unipolar) Strobe Input (4) Logic "1" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Current (6) Input Impedance POWER SUPPLIES + 15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Max Volt			1 standard l	S TTL load	
Strobe Input (4) Logic "1" Level Logic "0" Level Logic "0" Level Loding Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Voltage Input Impedance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Max Vo					
Strobe Input (4) Logic "1" Level Logic "0" Level Logic "0" Level Loading Width ANALOG OUTPUT Voltage Ranges (5) Current Load Impedance Output Voltage Output Current (6) Input Voltage Input Impedance POWER SUPPLIES + 15V Supply Tolerance Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain -5V Supply Tolerance Max Voltage Max Vol	output)				
Logic "1" Level	Strobe Input (4)	:	Binary (Onli	ooiar)	
Logic "0" Level Loading Width Nec 10 min	Logic "1" Level	l v	+2.0 to 5		
Loading Width nsec 10 min ANALOG OUTPUT Voltage Ranges (5) V ±10, ±5, ±2.5, 0 to -10 0 to -5 Current Load mA ±5 max 0.1 max REFERENCE Output Voltage V -10 ±0.1 Output Current (6) mA ±1 max Input Voltage V 0 to -10 Input Impedance Ω 3.3K POWER SUPPLIES + 15V Supply Tolerance Max Voltage V +18 max Current Drain mA 40 typ 50 max -15V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max -5V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max -5V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max -5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)	Logic "0" Level	V	0 to +0.8		
ANALOG OUTPUT	Loading			STTL loads	
Voltage Ranges (5) V ±10, ±5, ±2.5, 0 to -10 0 to -5 Current Load Impedance mA ±5 max 0.1 max REFERENCE Output Voltage V -10 ±0.1 Output Current (6) mA ±1 max Input Voltage V 0 to -10 Input Impedance Ω 3.3K POWER SUPPLIES + 15V Supply Tolerance % ±5 Max Voltage V + 18 max Current Drain mA 40 typ 50 max -15V Supply ±5 18 max Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)		nsec	10 min		
O to -5		l v	+10 +5 +	2.5. 0 to -10	
Current Load Impedance mA ±5 max REFERENCE 0.1 max Output Voltage V -10 ±0.1 Output Current (6) mA ±1 max Input Voltage V 0 to -10 Input Impedance Ω 3.3K POWER SUPPLIES + 15V Supply Tolerance % ±5 Max Voltage V + 18 max Current Drain mA 40 typ 50 max -15V Supply -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain MA 30 typ 45 max TEMPERATURE RANGE Operating (Case)	voltage haliges (5)	*		2.5, 0 10 - 10,	
REFERENCE	Current Load	mA			
Output Voltage V -10 ±0.1 Output Current (6) mA ±1 max Input Voltage V 0 to -10 Input Impedance Ω 3.3K POWER SUPPLIES + 15V Supply ±5 Tolerance % ±5 Max Voltage V +18 max Current Drain mA 40 typ 50 max -15V Supply -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case) Operating (Case)		Ω	0.1 max		
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Input Impedance Ω 3.3K POWER SUPPLIES + 15V Supply Tolerance % ±5 Max Voltage V +18 max Current Drain mA 40 typ 50 max -15V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)					
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+ 15V Supply Tolerance		-			
Tolerance % ±5 Max Voltage V +18 max Current Drain mA 40 typ 50 max -15V Supply Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)					
Max Voltage Current Drain -15V Supply Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage V Tolerance Max Voltage V Tolerance Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain TEMPERATURE RANGE Operating (Case)	1 '''	%	±5		
-15V Supply Tolerance	Max Voltage	V	+ 18 max		
Tolerance % ±5 Max Voltage V -18 max Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)		mA	40 typ 50 m	ax	
Max Voltage Current Drain +5V Supply Tolerance Max Voltage Current Drain TEMPERATURE RANGE Operating (Case) V -18 max 25 typ 35 max +55 W ±5 V +5.5 max 30 typ 45 max		n/			
Current Drain mA 25 typ 35 max +5V Supply Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)		1			
+5V Supply Tolerance		,	ł	ax	
Tolerance % ±5 Max Voltage V +5.5 max Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)			22 .76 33 111		
Current Drain mA 30 typ 45 max TEMPERATURE RANGE Operating (Case)	, , , ,	%	±5		
TEMPERATURE RANGE Operating (Case)	, ,	1			
Operating (Case)	· · · · · · · · · · · · · · · · · · ·	mA .	30 typ 45 m	ax	
-1 option °C -55 to +125					
	- 1 option	°C	- 55 to +125		
-3 option °C 0 to +70		°C			
Storage °C -65 to +150	Storage	°C	-65 to +150		

PARAMETER	UNITS	VALUE	
RESOLUTION	Bits	14	14
PHYSICAL CHARACTERISTICS			
Package		32 pin TDIP	
Size	in (mm)	1.15 × 1.75 × 0.21 (29 × 44 × 5)	
Weight	oz (g)	0.67 (19)	

NOTES: (1) Gain, offset, and pedestal errors are trimmable to zero.

- (2) Pedestal tempco is with no delay adjust capacitor pin 13 to pin 14.
- (3) Glitch is at 1 MHz update rate with a 5MHz filter.
- (4) Strobe input is a positive pulse. Data transferred on rising edge.
- (5) Output voltage ranges are pin programmable.
- (6) Measured with REFIN, REFOUT and BIPOLAR pins connected together.
- (7) Max Energy valid for 5V power supply ±2% Energy increases at 150mV/%5V power supply.

TECHNICAL DESCRIPTION

GENERAL

DAC-02310 is a completely self-contained deglitched D/A converter. As shown in the block diagram of Figure 1, it contains a 14 bit DAC, input registers, a precision DC reference, a track/hold deglitcher output and timing circuits. Its layout and compatible components provide the complete solution to low noise DAC design problems.

TIMING

Upon application of a STROBE IN signal the input registers are updated and the DAC-02310 output is held constant. As shown in Figure 2, the rising edge of the STROBE IN signal latches the input data. Internal timing circuits generate a POS STROBE OUT pulse which is used to open the FET switch at the op amp summing point. The output remains constant since the op amp feedback capacitor is charged. During this hold mode interval of approximately 40 nanoseconds, the DAC is changing value and its output glitch is settling to zero. At the end of the hold interval, POS STROBE OUT returns to is original track mode level and the FET switch closes. The DAC-02310 then smoothly changes to its new output level. The track/hold has effectively "masked out" the DAC glitch. POS STROBE OUT (pin 16) and NEG STROBE OUT (pin 14) should not be loaded with external circuitry.

DELAY ADJUST

The hold time interval is internally set to approximate 40 nanoseconds. For applications, such as CRT displays, which may require matched delays, an external DELAY ADJUST pin is provided. By adding a capacitor from pin 13 to pin 14, the hold time interval is made longer. This effectively increases the delay of the DAC-02310. Figure 3 illustrates the effect on hold time of adding capacitance to pin 13.

EXTERNAL TRIMS

Factory adjustment of DAC-02310 offset, gain and pedestal errors result in performance that is adequate for most applications. For more critical applications, DAC-02310 provides pins for externally trimming offset, gain and pedestal errors to zero. Figure 4 illustrates trim pot values and circuit connections for external trims.

OUTPUT VOLTAGE PROGRAMMING

DAC-02310 can be programmed for 5 different output voltage ranges by external jumpers between pins. Figure 6 illustrates the jumper connections required to yield \pm 10V, \pm 5V, \pm 2.5V, 0 to -10V, and 0 to -5V output voltage ranges.

OUTPUT CURRENT

The DAC-02310 can drive a load of ± 5 mA. For applications with higher current loads, the DAC-02310 can be used with a current booster. Figure 5 shows the interconnection of the DAC-02310 and DDC model HCD-13 hybrid cable driver; this allows the use of ± 200 mA loads.

INTERNAL REFERENCE

DAC-02310 contains a precision -10 volt internal reference which is made available for external use. For normal operation, REF OUT (Pin 25) must be jumpered to REF IN (Pin 24). Under these conditions, a maximum output current of 1 milliamp will be provided by the internal reference, while maintaining rated performance.

LAYOUT PRECAUTIONS

To achieve the minimum noise performance available from the DAC-02310 deglitched D/A converter, high frequency layout considerations must be kept in mind when designing its printed circuit board. All analog conductor lengths must be kept to a minimum, and a large area ground plane must be used to keep ground impedances as low as possible. Digital inputs and analog output must be kept separated from each other to minimize crosstalk. Circuits connected to the analog output must be kept as close to the D/A converter package as possible. Circuit connections to the external adjustment (offset, gain and pedestal) pins must be kept as short as possible, and must be kept separated from digital lines to minimize noise coupling.

POWER SUPPLY DECOUPLING

Decoupling capacitors are recommended on each power supply for minimum noise operation. Each of the power supplies should have a 1 microfarad or larger tantalum capacitor in parallel with a 0.01 microfarad ceramic capacitor. All capacitors must be mounted as close as possible to the hybrid package.

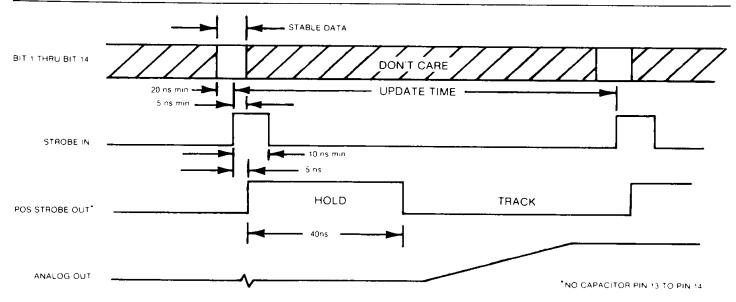


FIGURE 2. TIMING DIAGRAM

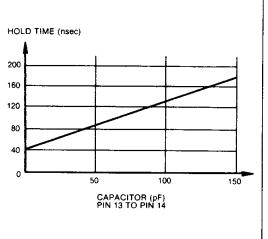


FIGURE 3. DELAY (HOLD) TIME ADJUST

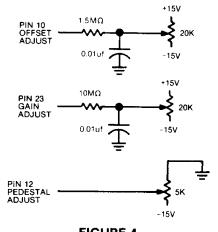


FIGURE 4. EXTERNAL TRIM CIRCUITS

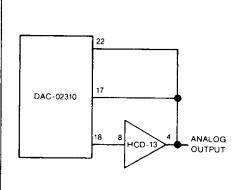


FIGURE 5. DAC-02310 AND CURRENT BOOSTER INTERCONNECTION



	JUMPER CONNECTIONS				
Voltage Range	Pin 22 to	Pin 21 to	Pin 20 to	Pin 17 to	Pin 24 to
<u>+</u> 10V	Pin 18		Pin 25	Pin 18	Pin 25
±5V	Pin 18	Pin 22	Pin 25	Pin 18	Pin 25
<u>+</u> 2.5V	Pin 10	Pin 18	Pin 25	Pin 18	Pin 25
0 to -10V	Pin 18	Pin 22		Pin 18	Pin 25
0 to -5V	Pin 10	Pin 18	_	Pin 18	Pin 25

FIGURE 6. OUTPUT VOLTAGE PROGRAMMING

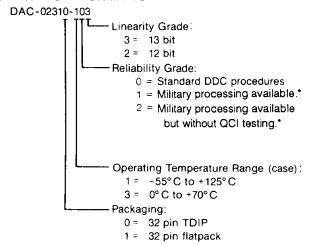
	OUTPUT VOLTAGE*		
INPUT DATA	BIPOLAR	UNIPOLAR	
00 0000 0000 0000	+5.0000V	0	
01 1111 1111 1111	+0.0006V	-4.9994V	
10 0000 0000 0000	0	-5.0000V	
11 1111 1111 1111	-4.9994V	-9.9994V	

^{*10} Volt Full Scale Range

FIGURE 7. INPUT DATA CODING

TABLE 2. PIN FUNCTION TABLE					
PIN	FUNCTION	PIN	FUNCTION		
1	Bit 8	17	Sense		
2	Bit 7	18	Analog Out		
3	Bit 6	19	-15 Volts		
4 5	Bit 5	20	Bipolar		
5	Bit 4	21	Feedback 1		
6	Bit 3	22	Feedback 2		
7	Bit 2	23	Gain Adjust		
8	Bit 1 (MSB)	24	Reference In		
9	+5 voits	25	Reference Out		
10	Feedback 3	26	Ground		
11	+15 Volts	27	Bit 14 (LSB)		
12	Pedestal Adjust	28	Bit 13 `		
13	Delay Adjust	29	Bit 12		
14	Neg. Strobe Out	30	Bit 11		
15	Strobe In	31	Bit 10		
16	Pos. Strobe Out	32	Bit 9		

ORDERING INFORMATION



MECHANICAL OUTLINE 32 Pin Triple DiP 0.210 MAX DAC-02310 1.155 MAX (5.3). (29.21)0.180 MIN (4.6)17 **o**-0 0000 0000 15 EQ.SP. 0.100 = 1.500TOL. NONCUM ō 00 1.755 MAX (2.5 = 38)(44.58)ō 0000000 0.120 0000 (3.05)32 O

BOTTOM VIEW 1. Dimensions shown are in inches (millimeters).

0.900

(22.86)

2. Lead identification numbers are for reference only.

3. Lead spacing dimensions apply at seating plane (TDIPs only).

 $0.018 \pm 0.002 \ (0.46 \pm 0.51)$

DIA PIN 32 REQ'D

SIDE VIEW

4. Pin material meets solderability requirements of MIL-STD-202E, Method 208C.

MECHANICAL OUTLINE

(3.09)

NOTES:

32 Pin Flatpack DAC-02311 10.500 MIN .10 MAX **-**(12.7) (27.9)32 15 EQ. SP. @ 0.100 = 1.500 (TOL. NONCUM) PIN 1 DENOTED BY 1.80 MAX (2.54 = 38.1)(45.7)CONTRASTING COLORED BEAD 0.100 TYP 0.147 ± 0.010 (2.54) (3.734 ± 0.254) 0.020R TYP (0.508)16 0.015 ± 0.003 TYP 0.175 MAX TOP VIEW (0.318 ± 0.076) (4.45)SIDE VIEW 0.010 ± 0.002 0.065 (0.254 ± 0.508)

М

For current booster order HCD-13.

*Consult factory for details.