

SPECIFICATIONS (typical @ +25°C with nominal power supply voltages unless otherwise noted)

MODEL	UNITS	CURRENT OUT			VOLTAGE OUT		
		HDS-0820	HDS-1025	HDS-1250	HDH-0802	HDH-1003	HDH-1205
RESOLUTION FS = Full Scale	Bits	8	10	12	8	10	12
LSB WEIGHT		40μA	10μA	2.5μA	40mV	10mV	2.5mV
ACCURACY (Relative to FS Including Linearity) ±% FS		0.1	0.05	0.0125	0.1	0.05	0.0125
Linearity		±10μA	±5μA	±1.25μA	±10mV	±5mV	±1.25mV
	LSB	±1/4	±1/2	±1/2	±1/4	±1/2	±1/2
Monotonicity		Guaranteed Over Operating Temperature Range					
Zero Offset (Initial)		15nA max	*	*	10mV typ 50mV max	*	*
TEMPERATURE COEFFICIENTS							
Linearity	ppm/°C	3	*	*	*	*	*
Gain	ppm/°C	30	*	*	*	*	*
Unipolar Offset	ppm/°C	3	*	*	*	*	*
Bipolar Offset	ppm/°C	15	*	*	*	*	*
DATA INPUTS							
Logic Compatibility		TTL and 5V CMOS					
Logic Voltage Levels Positive Logic "1" =	V	+2 to +7	*	*	*	*	*
"0" =	V	0 to +0.8	*	*	*	*	*
Logic Loading (Each Bit) "1" =	μA	40	*	*	*	*	*
"0" =	mA	-2.6	*	*	*	*	*
Codes		BIN, OBN			BIN, OBN		
OUTPUT							
Current Range FS							
Unipolar	mA	+10.24	*	+10.24	±25 max	**	**
				±0.2% (max)			
Bipolar	mA	±5.12	*	±5.12	±25 max	**	**
				±0.2% (max)			
Voltage Out FS ^{1,2}							
Unipolar HDS with 200Ω	V	+1.024	*	+1.024	-10.24 ±0.1%	**	**
Internal Connected R _L				±0.05%			
Bipolar	V	±0.512	*	±0.512	±5.12 ±0.05%	**	**
				±0.025%			
Compliance	V	+1.5, -2	*	*	N/A	**	**
Impedance, Internal (See Figure 1)	Ω	200	*	*	0.1 max	**	**
SETTLING TIME							
Current	ns to % FS	20 to 0.4	25 to 0.1	35 to 0.025	N/A	N/A	N/A
Voltage ²							
Unipolar or Bipolar Out, 75Ω Load, 0.56V p-p	ns to % FS	30 to 0.4	35 to 0.1	50 to 0.025	N/A	N/A	N/A
Unipolar or Bipolar Out, Internal 200Ω Load, 1.024V p-p	ns to % FS	45 to 0.4	50 to 0.1	60 to 0.025	N/A	N/A	N/A
10V Output Step	ns to % FS	N/A	N/A	N/A	200 to 0.4	300 to 0.1	500 to 0.025
5V Output Step	ns to % FS	N/A	N/A	N/A	150 to 0.4	200 to 0.1	350 to 0.025
POWER REQUIREMENTS							
+14.5V to +15.5V	mA max	42	*	55	70	**	**
-12V to -16V	mA max	14	*	18	40	**	**
Power Supply Rejection (+15V)	%/%	0.06	*	*	*	*	*
Power Supply Rejection Ratio (-15V)	%/%	0.04	*	*	*	*	*
TEMPERATURE RANGE							
Operating - Glass Package	°C	0 to +70	*	*	*	*	*
Operating - "M" Metal Case ³	°C	-55 to +125	*	*	*	*	*
Storage	°C	-55 to +125	*	*	*	*	*
PACKAGE OPTIONS ⁴		HY24E			HY24G		

NOTES

¹ Other voltages may be obtained with external resistor.

² For HDS series, $V_{OUT} = I_{OUT} \times R_{equivalent}$ which is the value of the 200Ω internal impedance in parallel with the external load resistance. Thus, by correct selection of external R₁ V_{OUT} can be any magnitude up to the + or - compliance voltage. See Figures 1 and 2.

³ Contact factory or local Analog Devices sales office for "M" Metal Case device specifications and prices.

⁴ See Section 19 for package outline information.

* Specifications same as HDS-0820.

** Specifications same as HDH-0802.

Specifications subject to change without notice.

PIN DESIGNATIONS
HDS-0820, HDS-1025

PIN	FUNCTION
1	+15V
2,3*	BIT 1 (MSB)
4	BIT 2
5	BIT 3
6	BIT 4
7	BIT 5
8	BIT 6
9	BIT 7
10	BIT 8
11	BIT 9 (HDS-1025)
12	BIT 10
13-20	GND
21	OUTPUT (I_O)
22	R_L 200 Ω
23	BIPOLAR OFFSET
24	-15V

*PINS 2 AND 3 MUST BE CONNECTED TOGETHER EXTERNALLY.

PIN DESIGNATIONS
HDS-1250

PIN	FUNCTION
1	BIT 1 (MSB)
2	BIT 2
3	BIT 3
4	BIT 4
5	BIT 5
6	BIT 6
7	BIT 7
8	BIT 8
9	BIT 9
10	BIT 10
11	BIT 11
12	BIT 12
13-19	GND
20	OUTPUT (I_O)
21	R_L 200 Ω
22	BIPOLAR OFFSET
23	-15V
24	+15V

PIN DESIGNATIONS
HDH SERIES

PIN	FUNCTION
1	BIT 1 (MSB)
2	BIT 2
3	BIT 3
4	BIT 4
5	BIT 5
6	BIT 6
7	BIT 7
8	BIT 8
9	BIT 9
10	BIT 10
11	BIT 11
12	BIT 12
13-19	GROUND
20	SUM NODE
21	OUTPUT
22	BIPOLAR OFFSET
23	-15V
24	+15V

ON HDH-0802 DEVICES, GROUND PINS 9, 10, 11 AND 12.
ON HDH-1003 DEVICES, GROUND PINS 11 AND 12.

Analog Output, ± 5.12 mA	Offset Binary
+5.11mA (1LSB)	111.....1
+2.56mA	110.....0
0mA	100.....0
-2.56mA	010.....0
-5.12mA	000.....0
Analog Output, 0 to +10.24mA	Straight Binary
+10.23mA	111.....1
+7.68mA	110.....0
+5.12mA	100.....0
+2.56mA	010.....0
0mA	000.....0

Table II. Coding HDS Series

Analog Output, ± 5.12 V	Complement Offset Binary
-5.1175V	111.....1
-2.56V	110.....0
0V	100.....0
+2.56V	010.....0
+5.12V	000.....0
Analog Output, 0 to +10.24V	Complement Binary
-10.2375V	111.....1
-7.68V	110.....0
-5.12V	100.....0
-2.56V	010.....0
0V	000.....0

Table III. Coding HDH Series

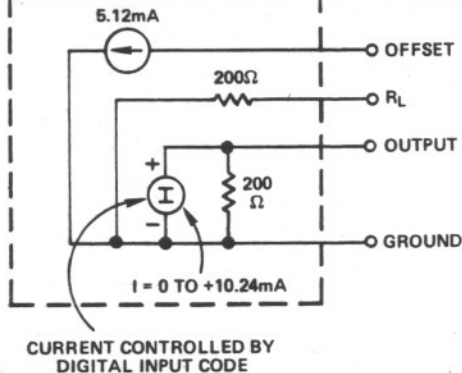


Figure 1. HDS Current Equivalent Circuit

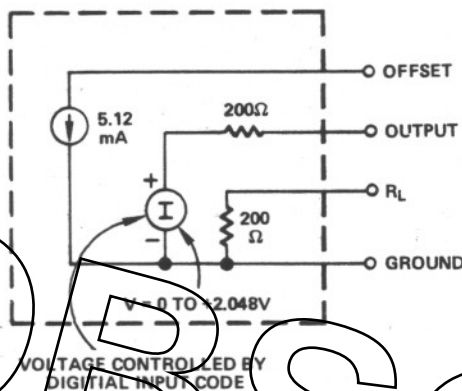


Figure 2. HDS Voltage Equivalent Circuit

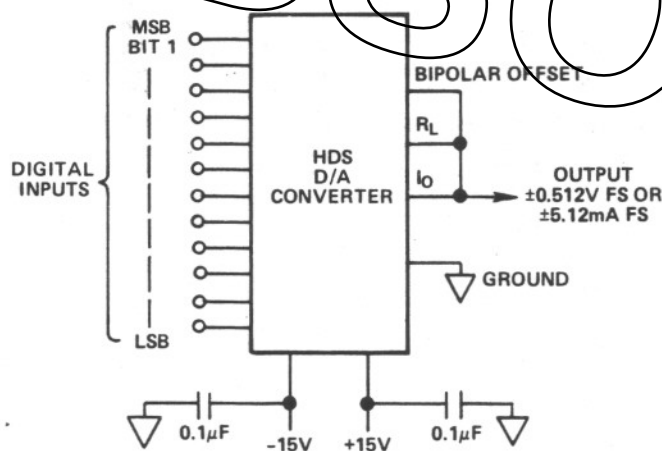


Figure 3. Bipolar Current Output

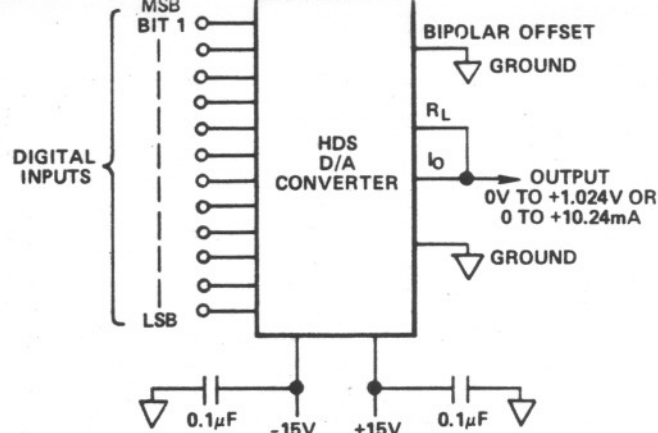


Figure 4. Unipolar Current Output

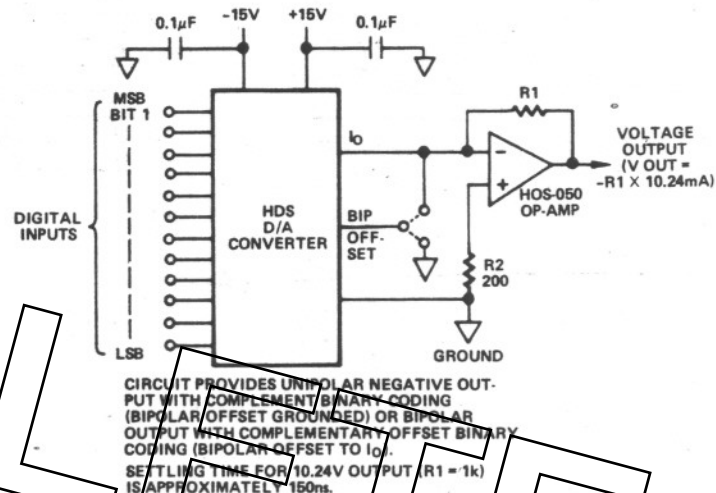


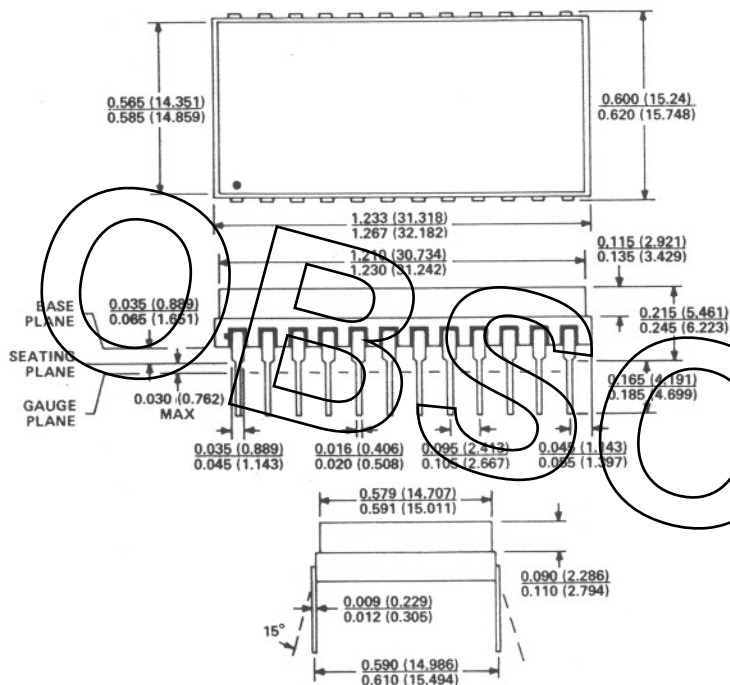
Figure 5. Inverting Unipolar or Bipolar Voltage Output

ORDERING INFORMATION

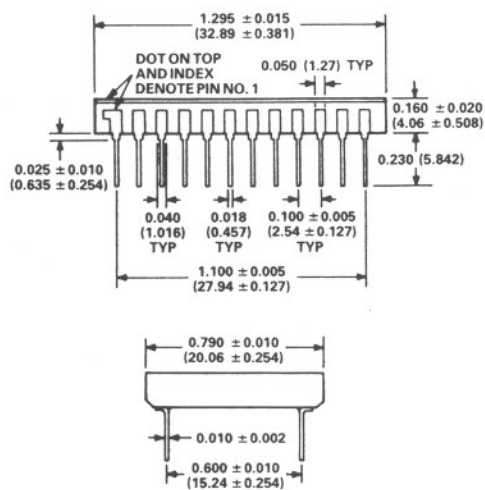
Order model number HDS-0820, HDS-1025, HDS-1250, HDH-0802, HDH-1003, HDH-1205. Models with extended operating temperature range, hermetically-sealed metal-case construction (M versions). Consult factory or local Analog Devices sales office for further information.

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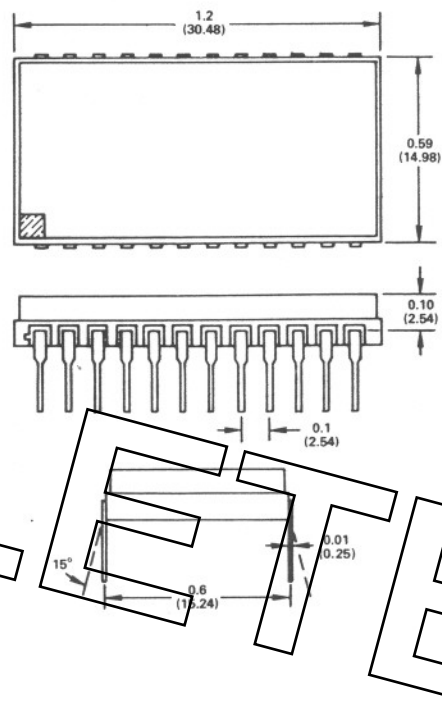
24-Pin Hybrid Package



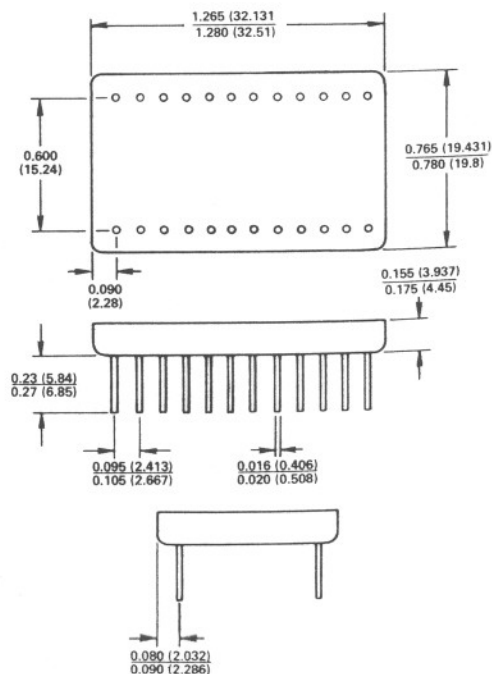
24-Pin Hybrid Package



24-Pin Hybrid Package



24-Pin Hybrid Package



Dimensions shown in inches and (mm).
Lead No. 1 Identified by Dot or Notch.