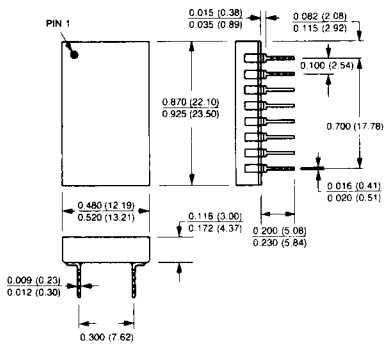


FEATURES

- 1 μ sec Maximum Settling Time (Full Scale Step to $\pm 1/2$ LSB)
- Complete D/A Converters: Internal Reference Internal Output Amplifier
- $\pm 1/2$ LSB Linearity and Monotonicity Guaranteed Over Temperature
- Small 16-Pin DIP
- Full Mil Operation -55°C to +125°C
- MIL-H-38534 Screening Optional. MIL-STD-1772 Qualified Facility

16 PIN DIP



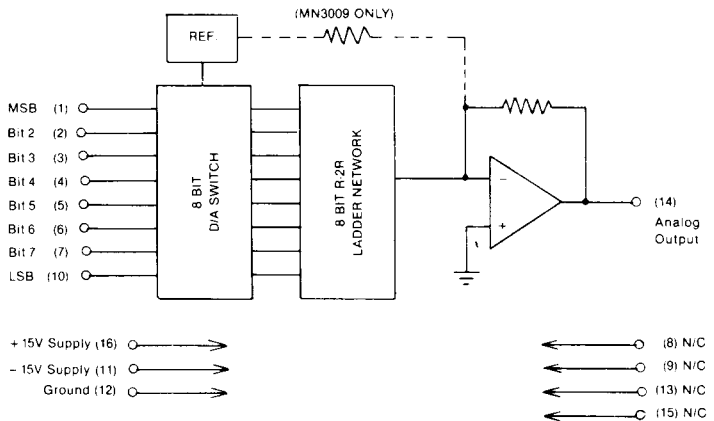
DESCRIPTION

MN3008 and MN3009 are very fast, complete, voltage-output, 8-bit digital-to-analog converters in dual-in-line packages. Both devices include an internal voltage reference and output amplifier, and both are packaged in hermetically sealed, 16-pin, ceramic DIP's. Output settling time to $\pm 1/2$ LSB is guaranteed to be less than 1 μ sec for a full scale (4V) change.

Models are available for either 0°C to +70°C or -55°C to +125°C ("H" models) operation. For military/aerospace or harsh-environment commercial/industrial applications, "H/B CH" models are fully screened to MIL-H-38534 in Micro Networks MIL-STD-1772 Qualified Facility.

Offering the inherent stability of thin-film hybrid construction and guaranteed performance over temperature, MN3008 and MN3009 are ideal choices for applications where space, weight and size are at a premium. Typical applications include avionics and fire control systems, high-speed function generators and graphic displays.

BLOCK DIAGRAM



MN3008/09

MN3008 AND MN3009 HIGH-SPEED 8-BIT D/A CONVERTERS

ABSOLUTE MAXIMUM RATINGS

Operating Temperature	0°C to +70°C -55°C to +125°C ("H" Models)
Storage Temperature	-65°C to +150°C
+15V Supply (Pin 16)	+18 Volts
-15V Supply (Pin 11)	-18 Volts
Digital Inputs (Pins 1-7, 10)	-0.5 to +15 Volts

ORDERING INFORMATION

PART NUMBER	MN3008H/B CH
Select MN3008 or MN3009.	
Standard Part is specified for 0°C to +70°C operation.	
Add "H" suffix for specified -55°C to +125°C operation.	
Add "B" to "H" devices for Environmental Stress Screening.	
Add "CH" to "H/B" devices for 100% screening according to MIL-H-38534.	

SPECIFICATIONS (T_A = 25°C, Supply Voltages ±15V, unless otherwise specified).

DIGITAL INPUTS	MIN.	TYP.	MAX.	UNITS
Logic Levels: Logic "1" Logic "0"	2.0		0.8	Volts Volts
Input Currents: Logic "1" Logic "0"			40 -1.0	μA mA
ANALOG OUTPUTS				
Output Voltage Range: MN3008 MN3009		0 to +4 -2 to +2		Volts Volts
Output Impedance Output Load Current	±3	0.5		Ohms mA
TRANSFER CHARACTERISTICS				
Linearity Error (Note 1): 0°C to +70°C -55°C to +125°C "H" Models		± ¼	± ½ ± ½	LSB LSB
Absolute Accuracy Error (Notes 2,3): +25°C 0°C to +70°C -55°C to +125°C "H" Models		± 0.1 ± 0.2 ± 0.5	± 0.4 ± 0.4 ± 1.0	% FSR % FSR % FSR
DYNAMIC CHARACTERISTICS				
Settling Time (Full Scale Change to ± ½ LSB) Output Slew Rate		0.5 30	1.0	μSec V/μSec
POWER SUPPLY REQUIREMENTS				
Power Supply Range: +15V Supply -15V Supply	+14.55 -14.55	+15.00 -15.00	+15.45 -15.45	Volts Volts
Power Supply Rejection: +15V Supply -15V Supply		± 0.01 ± 0.02	± 0.02 ± 0.04	% FSR / % Vs % FSR / % Vs
Current Drain, Output Unloaded: +15V Supply -15V Supply		15 -18	25 -25	mA mA
Power Consumption		495	750	mW

SPECIFICATION NOTES:

- Micro Networks tests and guarantees maximum linearity error at room temperature and at both extremes of the specified operating temperature range.
- The Absolute Accuracy Error of a voltage output D/A is the difference between the actual output voltage that appears following the application of a given digital input code and the ideal or expected output voltage for that code. Absolute Accuracy Error includes gain, offset, linearity, and noise errors and encompasses the drifts of these errors when specified over temperature. For the MN3008 and MN3009, the Absolute Accuracy Error specification applies over the converters' entire output range. We test Absolute Accuracy Error at both endpoints of the

MN3008's output range and at both endpoints and the midpoint of the MN3009's output range. This testing, coupled with our linearity testing, allows us to guarantee that, from 0°C to +70°C, any analog output will be within ±0.4%FSR (±1 LSB) of its ideal level and that, from -55°C to +125°C, any analog output will be within ±1.0%FSR of its ideal level. See Note 3.

- For an 8 bit converter, 1 LSB corresponds to 0.39%FSR. FSR stands for Full Scale Range and is equal to the peak to peak voltage of the converters output range. For the MN3008 and MN3009, FSR equals 4V, and 1 LSB = 15.6mV.

DIGITAL INPUT CODING

DIGITAL INPUT		ANALOG OUTPUT (DC VOLTS)	
MSB	LSB	MN3008	MN3009
1111	1111	+3.984	-1.984
1111	1110	+3.969	-1.969
1000	0000	+2.000	0.000
0111	1111	+1.984	+0.016
0000	0001	+0.016	+1.984
0000	0000	0.000	+2.000

LAYOUT CONSIDERATIONS

Proper attention to layout and decoupling is necessary to obtain specified accuracies from the MN3008 and MN3009. The units' Ground (Pin 12) should be tied to system analog ground as close to the package as possible, preferably through a large ground plane beneath the package. Power supplies should be decoupled with tantalum or electrolytic type capacitors located close to the unit. For optimum noise rejection, 1 μF capacitors parallel with 0.01 μF ceramic capacitors should be used as shown in the adjacent diagram.

