MICRO NETWORKS

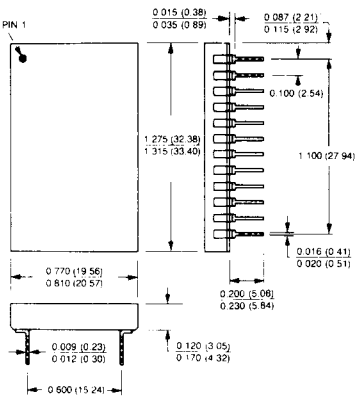
MN3349

LOW-POWER, 12-Bit
D/A CONVERTER

FEATURES

- DAC349 Pin Compatible
- Complete D/A Converter:
  Internal Reference
  Internal Output Amplifier
- Low Power 375mW Max
- Small 24-Pin DIP
- 5 User-Selectable Output Ranges
- Full Mil Operation −55°C to +125°C
- MIL-H-38534 Screening Optional. MIL-STD-1772 Qualified Facility

24 PIN DIP



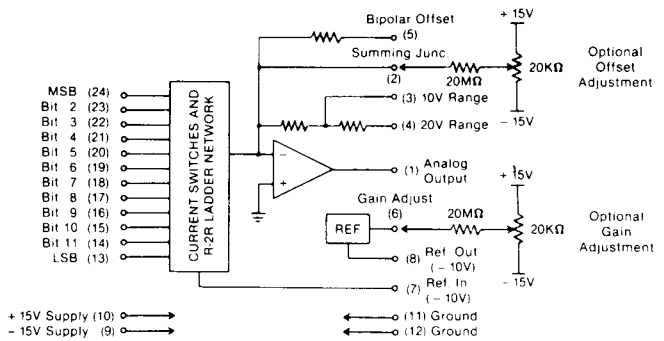
Dimensions in Inches
(millimeters)

DESCRIPTION

MN3349 is a low-power 12-bit D/A converter. It is an exact pin-for-pin replacement for the DAC349, offering superior performance and fully guaranteed specifications. Each unit is complete with internal reference and output amplifier and is housed in an industry-standard, 24-pin dual-in-line package. Operating temperature range is −55°C to +125°C, and all key performance specifications are given as maximums and guaranteed. Features include 5 user-selectable output ranges, 10μsec maximum settling time and 375mW maximum power consumption. For military/aerospace or harsh-environment commercial/industrial applications, MN3349H/B CH fully screened to MIL-H-38534 in Micro Networks MIL-STD-1772 qualified facility.

MN3349 was designed for requirements in which power, speed, size and temperature considerations are paramount. Maximum specifications minimize design and purchasing time and ensure field interchangeability without the need for recalibration.

BLOCK DIAGRAM



MN3349

MICRO NETWORKS
324 Clark St., Worcester, MA 01606 (508) 852-5400

MN3349 LOW-POWER 12-Bit D/A CONVERTER

ORDERING INFORMATION

PART NUMBER — MN3349H/B CH

Standard part is specified for 0°C to +70°C operation.
Add "H" for specified −55°C to +125°C operation.
Add "/B" to "H" models for Environmental Stress Streening.
Add "CH" to "H/B" models for 100% screening according to MIL-H-38534.

ABSOLUTE MAXIMUM RATINGS

Operating Temperature	−55°C to +125°C
Storage Temperature	−65°C to +150°C
Positive Supply (Pin 10)	+18 Volts
Negative Supply (Pin 9)	−18 Volts
Digital Inputs (Pins 13-24)	−0.5 to +5.5 Volts

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

DIGITAL INPUTS	MIN.	TYP.	MAX.	UNITS
Logic Levels: Logic "1" Logic "0"	3.5		 1.5	Volts Volts
Logic Coding: Unipolar Ranges Bipolar Ranges	Complementary Binary Complementary Offset Binary			
Input Current		±10		pA
ANALOG OUTPUT				
Unipolar Output Ranges Bipolar Output Ranges	0 to −5, 0 to −10 ±2.5, ±5, ±10			Volts Volts
Output Impedance Output Load Current	 ±5	0.1 ±10		Ω mA
TRANSFER CHARACTERISTICS				
Linearity Error Differential Linearity			±½ ±1	LSB LSB
Monotonicity	Guaranteed			
Scale Factor, Gain Error (Note 1) Unipolar Offset Error (Notes 1, 2) Bipolar Offset Error (Notes 1, 2)		±0.05 ±0.05 ±0.05	±0.1 ±0.2 ±0.1	% %FSR %FSR
DYNAMIC CHARACTERISTICS				
Settling time (20V Step to ±½ LSB) Output Slew Rate		8 10	10	μSec V/μSec
DRIFT CHARACTERISTICS				
Accuracy Drift (Note 3) Linearity Drift Differential Linearity Drift			±30 ±5 ±2	ppm of FSR/°C ppm of FSR/°C ppm of FSR/°C
REFERENCE (Note 4)				
Internal External		−10 −10		Volts Volts
POWER SUPPLY REQUIREMENTS				
Power Supply Range: +15V Supply −15V Supply	+9.00 −13.00	+15.00 −15.00	+18.00 −18.00	Volts Volts
Current Drain, Output Unloaded: +15V Supply −15V Supply		5 −8	10 −15	mA mA
Power Supply Rejection		±0.001	±0.005	%FSR/%Vs
Power Consumption		195	375	mW

SPECIFICATION NOTES:

1. Initial Offset and Gain Errors are externally adjustable (see below).
2. FSR stands for Full Scale Range and is equal to the peak to peak voltage of the selected output range. For the 0 to −5V and ±2.5V ranges, FSR = 5V. For the 0 to −10V and ±5V ranges, FSR = 10V. For the ±10 range, FSR = 20V. 1 LSB for a 12 bit converter = 0.024%FSR.
3. Total effect of linearity, offset, and gain drift on overall converter accuracy.
4. For the specified performance Pin 8 (Ref. Out) must be connected to Pin 7 (Ref. In). Any additional loading of the reference must not exceed 1 mA. If an external reference is used, its voltage must be −10.000V and it must be able to supply 1 mA.

OPTIONAL GAIN AND OFFSET ADJUSTMENTS

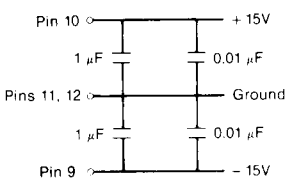
Connect the Offset and Gain Adjust potentiometers as shown in the block diagram.

UNIPOLAR RANGES—Apply a digital input of all "0's" and adjust the OFFSET potentiometer for 0V out. Apply all "1's" and adjust the GAIN potentiometer for the output value shown in the table.

BIPOLAR RANGES—Apply a digital input of all "0's" and adjust the OFFSET potentiometer for the minus full scale output. Apply all "1's" and adjust the GAIN potentiometer for the output value shown in the table.

POWER SUPPLY DECOUPLING

Power supplies should be decoupled with 1 μF capacitors paralleled with 0.01 μF ceramic capacitors as shown below.



DIGITAL INPUT CODING

DIGITAL INPUT MSB LSB	ANALOG OUTPUT 0 to −5V	0 to −10V	±2.5V	±5V	±10V
1111 1111 1111	−4.9988	−9.9976	−2.4988	−4.9976	−9.9951
1111 1111 1110	−4.9976	−9.9951	−2.4976	−4.9951	−9.9902
1000 0000 0001	−2.5012	−5.0024	−0.0012	−0.0024	−0.0049
1000 0000 0000	−2.5000	−5.0000	0.0000	0.0000	0.0000
0111 1111 1111	−2.4988	−4.9976	+0.0012	+0.0024	+0.0049
0000 0000 0001	−0.0012	−0.0024	+2.4988	+4.9976	+9.9951
0000 0000 0000	0.0000	0.0000	+2.5000	+5.0000	+10.0000
Connect Pin to Pin	8 to 7 5 to 11 1 to 3 2 to 4	8 to 7 5 to 11 1 to 3	8 to 7 5 to 7 1 to 3 2 to 4	8 to 7 5 to 7 1 to 3	8 to 7 5 to 7 1 to 4