**DESCRIPTION**

The MN3040 is a fast, 10-bit digital-to-analog converter with a fast TTL input register for easy interfacing and rapid throughputs in microprocessor-based systems. It is packaged in a hermetically sealed, ceramic, 18-pin dual-in-line and is complete with internal reference and output amplifier. Two output ranges are available (0 to −10V and ±10V), and performance features include the following: fast output settling (typically 5μsec for a 20V change), ±0.1%FSR overall accuracy, and ±½LSB linearity and monotonicity guaranteed over the entire operating temperature range. Maximum power consumption is 715 mW.

The MN3040 is actively laser trimmed as a complete device for linearity, gain and offset, eliminating the need for external adjusting potentiometers. Units are available for either 0°C to +70°C or −55°C to +125°C (“H” models) operation, and Micro Networks 100% tests and guarantees both linearity and accuracy at room temperature and at both operating temperature extremes. For military/aerospace or harsh-environment commercial/industrial applications, “H/B CH” models are fully screened to MIL-PRF-38534.

The MN3040’s digital inputs are TTL compatible, and its internal input register facilitates interfacing to microprocessor and minicomputer data busses. Applications include microprocessor-based data distribution systems, programmable power supplies, low-resolution displays and servo drivers.
MN3040 10-BIT D/A CONVERTER with INPUT REGISTER

**ABSOLUTE MAXIMUM RATINGS**
- Operating Temperature: -55°C to +125°C
- Specified Temperature: 0°C to +70°C (Standard) -55°C to +125°C ("H" Models)
- Storage Temperature: -65°C to +150°C
- +15V Supply (Pin 8): 18 Volts
- -15V Supply (Pin 9): 18 Volts
- +5V Supply (Pin 7): 0.5 to +7 Volts
- Digital Inputs (Pins 1-5, 14-18): 0.5 to +5.5 Volts
- Register Enable (Pin 6): -0.5 to +5.5 Volts
- Output Current: (Note 1)

**ORDERING INFORMATION**
- PART NUMBER: MN3040H/B CH
- Standard part is specified for 0°C to +70°C operation.
- Add "H" for specified -55°C to +125°C operation.
- Add "IB" to "H" models for Environmental Stress Screening.
- Add "CH" to "IB" models for 100% screening according to MIL-PRF-38534.

**SPECIFICATIONS** ($T_a = +25°C$, Supply Voltages ±15V and +5V, unless otherwise specified)

### DIGITAL INPUTS
<table>
<thead>
<tr>
<th>Logic Coding:</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logic Levels:</td>
<td>Complementary Binary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic &quot;1&quot;</td>
<td>2.0</td>
<td></td>
<td></td>
<td>Volts</td>
</tr>
<tr>
<td>Logic &quot;0&quot;</td>
<td>0.7</td>
<td></td>
<td></td>
<td>Volts</td>
</tr>
<tr>
<td>Data Inputs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic &quot;1&quot; ($V_{IN} = 2.4$ Volts)</td>
<td>30</td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Logic &quot;0&quot; ($V_{IN} = 0.3$ Volts)</td>
<td>0.6</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Register Enable:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic &quot;1&quot; ($V_{IN} = 2.4$ Volts)</td>
<td>60</td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Logic &quot;0&quot; ($V_{IN} = 0.3$ Volts)</td>
<td>1.2</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Register Enable (Note 2):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse Width</td>
<td>60</td>
<td></td>
<td></td>
<td>nSec</td>
</tr>
<tr>
<td>Setup Time Digital Data to Enable</td>
<td>40</td>
<td></td>
<td></td>
<td>nSec</td>
</tr>
</tbody>
</table>

### ANALOG OUTPUTS
| Output Impedance | ±4 | 0.5 | | | Ω |
| Output Load Current | | | | mA |

### TRANSFER CHARACTERISTICS
- Linearity Error (Notes 3, 5): 0°C to +70°C
- -55°C to +125°C ("H" Models)

### DYNAMIC CHARACTERISTICS
- Monotonicity Guaranteed Over Temperature
- Absolute Accuracy Error (Notes 4, 5): +25°C
- 0°C to +70°C
- -55°C to +125°C ("H" Models)

### POWER SUPPLY REQUIREMENTS
- Power Supply Range: +15V Supply
- -15V Supply
- +5V Supply
- Power Supply Rejection: +15V Supply
- -15V Supply

### POWER CONSUMPTION
- Current Drain, Output Unloaded: +15V Supply
- -15V Supply
- +5V Supply
- Power Consumption: 450 715 mW

**SPECIFICATIONS NOTES**
1. The output is short circuit protected to ground or either supply.
2. Converter analog output will follow digital input when Register Enable is a logic "0." Digital input data will be latched and analog output voltage constant when Register Enable is a logic "1." The minimum Register Enable pulse width to latch new digital input data is 60 nSec. See Timing Diagram.
3. Micro Networks tests and guarantees maximum Linearity Error at room temperature and at both extremes of the specified operating temperature range.
4. The Absolute Accuracy Error specification applies only over the converter's entire output range. See Absolute Accuracy Error section below for an explanation of how Micro Networks Corporation tests and specifies Absolute Accuracy Error and Gain Error.
5. 1 LSB for a 10 bit converter corresponds to 0.098% FSR. See Note 6.
6. FSR stands for Full Scale Range and is equal to the peak to peak voltage of the selected output range. For the ±10V output range, FSR is 20 volts, and 1 LSB is equal to 1.95 mV. For the ±5V output range, FSR is 10 volts, and 1 LSB is equal to 0.98 mV.