

**MNDM54LS04-X REV 1A0**

Original Creation Date: 04/23/98

Last Update Date: 05/14/98

Last Major Revision Date: 04/23/98

## HEX INVERTING GATES

### General Description

This device contains six independent gates, each of which performs the logic INVERT function.

### Industry Part Number

54LS04

### NS Part Numbers

DM54LS04E/883

DM54LS04J/883

DM54LS04W/883

### Prime Die

L004

### Processing

MIL-STD-883, Method 5004

### Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp ( °C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

## Features

**(Absolute Maximum Ratings)**

(Note 1)

Storage Temperature	-65 C to +150 C
Ambient Temperature under Bias	-55 C to +125 C
Input Voltage	-0.5V to +10.0V
VCC Pin Potential to Ground Pin	-0.5V to +7.0V
Junction Temperature under Bias	-55 C to +175 C
Current Applied to Output in LOW state (Max)	twice the rated I <sub>ol</sub> (ma)

Note 1: Absolute Maximum ratings are those values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Recommended Operating Conditions**

Free Air Ambient Temperature	
Military	-55 C to +125 C
Supply Voltage	
Military	+4.5V to +5.5V

## Electrical Characteristics

### DC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: VCC 4.5V to 5.5V, Temp range: -55C to 125C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	Input High Current	VCC=5.5V, VM=2.7V, VINH=4.5V	1, 3	INPUTS		20.0	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=10.0V, VINH=4.5V	1, 3	INPUTS		100	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VM=0.4V, VINH=4.5V	1, 3	INPUTS	-0.03	-0.4	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIH=2.0V, IOL=4.0mA, VINH=4.5V	1, 3	OUTPUTS		0.4	V	1, 2, 3
VOH	High Level Output Voltage	VCC=4.5V, VIL=0.7V, VINH=4.5V, IOH=-0.4mA	1, 3	OUTPUTS	2.5		V	1, 2, 3
IOS	Short Circuit Output Current	VCC=5.5V, VINL=0.0V, VOUT=0.0V	1, 3	OUTPUTS	-20.0	-100	mA	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IM=-18mA, VINH=4.5V	1, 3	INPUTS		-1.5	V	1, 2, 3
ICCH	Supply Current	VCC=5.5V, VINL=0.0V	1, 3	VCC		2.4	mA	1, 2, 3
ICCL	Supply Current	VCC=5.5V, VINH=4.5V	1, 3	VCC		6.6	mA	1, 2, 3

### AC PARAMETER - 15pF

(The following conditions apply to all the following parameters, unless otherwise specified.)

AC: CL=15pF, RL=2k ohms Temp range: -+25C

tpLH	Propagation Delay	VCC=5.0V	5	In to On		10.0	ns	9
tpHL	Propagation Delay	VCC=5.0V	5	In to On		10.0	ns	9

### AC PARAMETER - 50pF

(The following conditions apply to all the following parameters, unless otherwise specified.)

AC: CL=50pF, RL=2k ohms Temp range: -55C to +125C

tpLH	Propagation Delay	VCC=5.0V	2, 4	In to On	2.0	15.0	ns	9
			2, 4	In to On	2.0	20.0	ns	10, 11
tpHL	Propagation Delay	VCC=5.0V	2, 4	In to On	2.0	17.0	ns	9
			2, 4	In to On	2.0	24.0	ns	10, 11

Note 1: Screen tested 100% on each device at -55C, +25C & +125C temperature, subgroups A1, 2, 3, 7 & 8.

Note 2: Screen tested 100% on each device at +25C temperature only, subgroup A9.

**(Continued)**

- Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.
- Note 4: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C, subgroup A9. Subgroups 10 & 11 are guaranteed, not tested.
- Note 5: Guaranteed, not tested.

**Revision History**

Rev	ECN #	Rel Date	Originator	Changes
1A0	M0001237	05/14/98	Linda Collins	Initial release: MNDM54LS04-X Rev. 1A0. Added note 4 to the AC (50pF) notes reference column. Reworded note 4 from "and periodically at +125C & -55C, subgroups 10 & 11" to "Subgroups 10 & 11 are guaranteed, not tested".