



## MICROCIRCUIT DATA SHEET

**MNDM54LS241-X REV 1A0**

Original Creation Date: 04/31/98  
Last Update Date: 08/24/98  
Last Major Revision Date: 04/31/98

### OCTAL BUFFERS/LINE DRIVERS (with 3-state outputs)

#### General Description

The 'LS241 is an octal buffer and line driver designed to be employed as memory address drivers, clock drivers and bus-oriented transmitter/receivers which provide improved PC board density.

#### Industry Part Number

54LS241

#### NS Part Numbers

DM54LS241J/883

#### Prime Die

L241

---

#### 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**

- Tri-state outputs drive bus lines or buffer memory address registers
- Outputs sink 12 mA
- 12 mA source current
- Input clamp diodes limit high-speed termination effects
- Hysteresis at inputs to improve noise margins

**(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	-55C to +175C
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	-0.5	-200	uA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, IOL=12.0mA, VINH=4.5V, VIL=0.7V	1, 3	OUTPUTS		0.4	V	1, 2, 3
VOH	High Level Output Voltage	VCC=4.5V, IOH=-3.0mA, VIL=0.7V, VINH=4.5V, VIH=2.0V	1, 3	OUTPUTS	2.4		V	1, 2, 3
VOH 1	High Level Output Voltage	VCC=4.5V, IOH=-12mA, VIL=0.5V, VINH=4.5V, VIH=2.0V	1, 3	OUTPUTS	2.0		V	1, 2, 3
IOS	Short Circuit Output Current	VCC=5.5V, VINH=4.5V, VOUT=0.0V, VINL=0.0V	1, 3	OUTPUT	-50.0	-225	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
ICCL	Supply Current	VCC=5.5V, VINL=0.0V	1, 3	VCC		46.0	mA	1, 2, 3
ICCZ	Supply Current	VCC=5.5V, VINH=4.5V, VINL=0.0V	1, 3	VCC		54.0	mA	1, 2, 3
ICCH	Supply Current	VCC=5.5V, VINL=0.0V, VINH=4.5V	1, 3	VCC		23.0	mA	1, 2, 3
IOZH	Off-State Output Current (High)	VCC=5.5V, VINH=4.5V, VM=2.7V, VIH=2.0V, VINL=0.0V, VIL=0.7V	1, 3	OUTPUTS		20.0	uA	1, 2, 3
IOZL	Off-State Output Current (Low)	VCC=5.5V, VINH=4.5V, VM=0.4V, VIH=2.0V, VIL=0.7V	1, 3	OUTPUTS		-20.0	uA	1, 2, 3

## Electrical Characteristics

### AC PARAMETER - Alternate Load

(The following conditions apply to all the following parameters, unless otherwise specified.)  
 AC: CL=50pF, RL=110 ohms, R=2.4K ohms Temp range: -55C to +125C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH (1)	Propagation Delay	VCC=5.0V	2, 4	Data to Outputs	2.0	18.0	ns	9
			2, 4	Data to Outputs	2.0	23.0	ns	10, 11
tpHL (1)	Propagation Delay	VCC=5.0V	2, 4	Data to Outputs	2.0	18.0	ns	9
			2, 4	Data to Outputs	2.0	23.0	ns	10, 11
tpLZ	Output Disable	VCC=5.0V	2, 4	$\overline{OE}/OE$ to On	2.0	30.0	ns	9
			2, 4	$\overline{OE}/OE$ to On	2.0	39.0	ns	10, 11
tpHZ	Output Disable	VCC=5.0V	2, 4	$\overline{OE}/OE$ to On	2.0	35.0	ns	9
			2, 4	$\overline{OE}/OE$ to On	2.0	45.0	ns	10, 11
tpZL	Output Enable	VCC=5.0V	2, 4	$\overline{OE}/OE$ to On	2.0	30.0	ns	9
			2, 4	$\overline{OE}/OE$ to On	2.0	39.0	ns	10, 11
tpZH	Output Enable	VCC=5.0V	2, 4	$\overline{OE}/OE$ to On	2.0	30.0	ns	9
			2, 4	$\overline{OE}/OE$ to On	2.0	39.0	ns	10, 11

### AC PARAMETER - Standard Load

(The following conditions apply to all the following parameters, unless otherwise specified.)  
 AC: VCC=5.0V Temp range: +25C

tpLH	Propagation Delay	VCC=5.0V, CL=50pF	5, 6	Data to Output		18.0	ns	9
tpHL	Propagation Delay	VCC=5.0V, CL=50pF	5, 6	Data to Outputs		18.0	ns	9
tpLZ	Output Disable	VCC=5.0V, CL=5pF, RL=667 ohms, R=5K ohms	5, 6	$\overline{OE}/OE$ to On		25.0	ns	9
tpHZ	Output Disable	VCC=5.0V, CL=5pF, RL=667 ohms, R=5K ohms	5, 6	$\overline{OE}/OE$ to On		18.0	ns	9
tpZL	Output Enable	VCC=5.0V, CL=50pF, RL=667 ohms, R=5K ohms	5, 6	$\overline{OE}/OE$ to On		30.0	ns	9
tpZH	Output Enable	VCC=5.0V, CL=50pF, RL=667 ohms, R=5K ohms	5, 6	$\overline{OE}/OE$ to On		23.0	ns	9

**(Continued)**

- 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.
- 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.
- Note 6: NATIONAL TESTS TRI-STATE PROPAGATION DELAYS USING AN EQUIVALENT LOAD WITH CORRELATED LIMITS.

**Revision History**

Rev	ECN #	Rel Date	Originator	Changes
1A0	M0002090	08/24/98	Linda Collins	Initial MDS release:: MNDM54LS241-X Rev. 1A0. Added note 4 to the AC (Alternate Load) notes reference column. Reworded the phrase in note 4 from "and periodically at +125C & -55C, subgroups 10 & 11" to "Subgroups 10 & 11 are guaranteed, not tested".