National Semiconductor

MICROCIRCUIT DATA SHEET

MNDM54LS154-X REV 0A0

Original Creation Date: 04/13/98
Last Update Date: 06/16/98
Last Major Revision Date: 04/13/98

4-LINE to 16-LINE DECODERS/DEMULTIPLEXERS

General Description

Each of these 4-line to 16-line decoders utilizes TTL circuitry to decode four binary - coded inputs into one of sixteen mutually exclusive outputs when both the strobe inputs, G1 and G2 are LOW. The demultiplexing function is performed by using the four input lines to address the output line, passing data from one of the strobe inputs with the other strobe input LOW. When either strobe input is HIGH, all outputs are HIGH. These demultiplexers are ideally suited for implementing high-performance memory decoders. All inputs are buffered and input clamping diodes are provided to minimize transmission- line effects and thereby simplify system design.

Industry Part Number

54LS154

NS Part Numbers

DM54LS154J/883

Prime Die

R154

Controlling Document

8301701JA

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{o}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 +7.0V
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 Iol (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, VINL=0.0V, VINH=4.5V	1, 3	INPUTS		20.0	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=7.0V, VINH=4.5V, VINL=0.0V	1, 3	INPUTS		100	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VM=0.4V, VINL=0.0V, VINH=4.5V	1, 3	D1, D2		-0.4	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIH=2.0V, IOL=4.0mA, VINH=4.5V, VIL=0.7V	1, 3	OUTPUTS		0.4	V	1, 2, 3
VOH	High Level Output Voltage	VCC=4.5V, VIH=2.0V, IOH=-0.4mA, VIL=0.7V, VINH=4.5V	1, 3	OUTPUTS	2.5		V	1, 2, 3
IOS	Short Circuit Output Current	VCC=5.5V, VINH=4.5V, VOUT=0.0V, VINL=0.0V	1, 3	OUTPUT	-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
ICC	Supply Current	VCC=5.5V, VINL=0.0V	1, 3	VCC		14.0	mA	1, 2, 3

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 (1)	Propagation Delay	VCC=5.0V	2, 4, 5	Data to Ox		35.0	ns	9
			2, 4, 5	Data to Ox		44.0	ns	10, 11
tpHL (1)	Propagation Delay	VCC=5.0V	2, 4, 5	Data to Ox		35.0	ns	9
			2, 4, 5	Data to Ox		44.0	ns	10, 11
tpLH (2)	Propagation Delay	VCC=5.0V	2, 4, 5	Gx to Ox		25.0	ns	9
			2, 4, 5	Gx to Ox		31.5	ns	10, 11
tpHL (2)	Propagation Delay	VCC=5.0V	2, 4, 5	Gx to Ox		35.0	ns	9
			2, 4, 5	Gx to Ox		44.0	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.
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.
Note 5: Guaranteed, not tested at +125C & -55C.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
0A0	M0002896	06/16/98	Linda Collins	Initial MDS Release: MNDM54LS154-X Rev. 0A0.