National Semiconductor

MICROCIRCUIT DATA SHEET

MNMM54C151-X REV 1A0

Original Creation Date: 10/17/95
Last Update Date: 05/19/97
Last Major Revision Date: 04/02/97

8-CHANNEL DIGITAL MULTIPLEXER

General Description

The MM54C151 multiplexer is a monolithic complementary MOS (CMOS) integrated circuit constructed with N- and P-channel enhancement transistors.

This data selector/multiplexer contains on-chip binary decoding. Two outputs provide true (output Y) and complement (output W) data. A logical "1" on the strobe input forces W to a logical "1" and Y to a logical "0".

All inputs are protected against electrostatic effects.

Industry Part Number

MM54C151

NS Part Numbers

MM54C151J/883
MM54C151W/883

Prime Die

MM54C151

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

- Supply voltage range	3V to 15V
- Tenth power TTL compatible	drives 2 LPTTL loads
- High noise immunity	0.45 Vcc (typ.)
- Low power	50nW (typ.)

Applications

- Automotive
- Data terminals
- Instrumentation
- Medical electronics
- Alarm systems
- Industrial electronics
- Remote metering
- Computers

(Absolute Maximum Ratings)
(Note 1)

Voltage at Any Pin	-0.3V to Vcc +0.3V
Operating Temperature Range	-55 C to +125 C
Storage Temperature Range	-65 C to +150 C
Maximum Vcc Voltage	18V
Power Dissipation	
Dual-In-Line	700mW
Small Outline	500mW
Operating Vcc Range	3V to 15V
Lead Temperature (Soldering, 10 seconds)	260 C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

Electrical Characteristics

DC PARAMETERS:

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Voh	Logical "1" Output Voltage	Vcc = 5V, Vih = 3.5V, Vil = 1.5V, Iout = -10uA			4.5		V	1, 2, 3
		Vcc = 10V, Vih = 8V, Vil = 2V, Iout = -10uA			9		V	1, 2, 3
		Vcc = 4.5V, Vih = 3V, Vil = 0.8V, Iout = -360uA			2.4		V	1, 2, 3
Vol	Logical "0" Output Voltage	Vcc = 5V, Vih = 3.5V, Vil = 1.5V, Iout = 10uA				0.5	V	1, 2, 3
		Vcc = 10V, Vih = 8V, Vil = 2V, Iout = 10uA				1	V	1, 2, 3
		Vcc = 4.5V, Vih = 3V, Vil = 0.8V, Iout = 360uA				0.4	V	1, 2, 3
Iih	Logical "1" Input Current	Vcc = 15V, Vin = 15V, other inputs at 0V				0.15	uA	1, 3
						1	uA	2
Iil	Logical "0" Input Current	Vcc = 15V, Vin = 0V, other inputs at 15V				-0.15	uA	1, 3
						-1	uA	2
Icc	Quiescent Device Current	Vcc = 15V, Vih = 15V, Vil = 0V				10	uA	1, 3
						300	uA	2
Isource	Output Source Current	Vcc = 5V, Vih = 5V, Vil = 0V, Vout = 0			-1.75		mA	1, 3
					-1.2		mA	2
		Vcc = 10V, Vih = 10V, Vil = 0V, Vout = 0			-8		mA	1, 3
					-5.6		mA	2
Isink	Output Sink Current	Vcc = 5V, Vih = 5V, Vil = 0V, Vout = 5V			1.75		mA	1, 3
					1.2		mA	2
		Vcc = 10V, Vih = 10V, Vil = 0V, Vout = 10V			8		mA	1, 3
					5.6		mA	2
		Vcc = 4.5V, Vih = 3V, Vil = 0.8V, Vout = 0.4V			360		uA	1, 2, 3
Vih	Logical "1" Input Voltage	Vcc = 5V	1		3.5		V	1, 2, 3
		Vcc = 10V	1		8		V	1, 2, 3
		Vcc = 4.5V, (LP to CMOS)	1		3		V	1, 2, 3
		Vcc = 4.5V, (CMOS to LP)	1		4		V	1, 2, 3

Electrical Characteristics

DC PARAMETERS:(Continued)

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vil	Logical "0" Input Voltage	Vcc = 5V	1			1.5	V	1, 2, 3
		Vcc = 10V	1			2	V	1, 2, 3
		Vcc = 4.5V, (LP to CMOS)	1			0.8	V	1, 2, 3
		Vcc = 4.5V, (CMOS to LP)	1			1	V	1, 2, 3
Pd	Power Dissipation	Vcc = 15V	1			150	uW	1, 3
			1			4500	uW	2

AC PARAMETERS:

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: Cl = 50pF

tPHL	Propagation Delay Time: Data to Y	Vcc = 5V	3			270	nS	9
			3			460	nS	10
			3			215	nS	11
		Vcc = 10V	2			130	nS	9
			2			180	nS	10
			2			105	nS	11
tPLH	Propagation Delay Time: Data to Y	Vcc = 5V	3			270	nS	9
			3			460	nS	10
			3			215	nS	11
		Vcc = 10V	2			130	nS	9
			2			180	nS	10
			2			105	nS	11
tPHL	Propagation Delay Time: Data to W	Vcc = 5V	3			300	nS	9
			3			420	nS	10
			3			240	nS	11
		Vcc = 10V	2			140	nS	9
			2			195	nS	10
			2			110	ns	11

Electrical Characteristics

AC PARAMETERS:(Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: Cl = 50pF

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tPLH	Propagation Delay Time: Data to W	Vcc = 5V	3			300	nS	9
			3			420	nS	10
			3			240	nS	11
		Vcc = 10V	2			140	nS	9
			2			195	nS	10
			2			110	nS	11
tPHL	Propagation Delay Time: Select To Y	Vcc = 5V	3			360	nS	9
			3			505	nS	10
			3			290	nS	11
		Vcc = 10V	2			170	nS	9
			2			240	nS	10
			2			135	nS	11
tPLH	Propagation Delay Time: Select To Y	Vcc = 5V	3			360	nS	9
			3			505	nS	10
			3			290	nS	11
		Vcc = 10V	2			170	nS	9
			2			240	nS	10
			2			135	nS	11
tPHL	Propagation Delay Time: Strobe To Y	Vcc = 5V	3			360	nS	9
			3			505	nS	10
			3			290	nS	11
		Vcc = 10V	2			170	nS	9
			2			240	nS	10
			2			135	nS	11
tPLH	Propagation Delay Time: Strobe To Y	Vcc = 5V	3			360	nS	9
			3			505	nS	10
			3			290	nS	11
		Vcc = 10V	2			170	nS	9
			2			240	nS	10
			2			135	nS	11

Note 1: Parameter tested go-no-go only.

(Continued)

Note 2: Guaranteed parameter not tested.
Note 3: Tested at 25 C; guaranteed but not tested at +125 C and -55 C.