National Semiconductor

DM74ALS151
1 of 8 Line Data Selector/Multiplexer

General Description

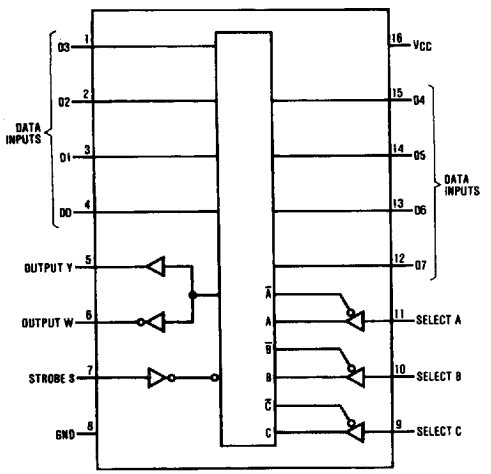
This Data Selector/Multiplexer contains full on-chip decoding to select one-of-eight data sources as a result of a unique three-bit binary code at the Select inputs. Two complementary outputs provide both inverting and non-inverting buffer operation. A Strobe input is provided which, when at the high level, disables all data inputs and forces the Y output to the low state and the W output to the high state. The Select input buffers incorporate internal overlap features to ensure that select input changes do not cause invalid output transients.

Features

- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Switching performance is guaranteed over full temperature and V_{CC} supply range
- Pin and functional compatible with LS family counterpart
- Improved output transient handling capability

Connection Diagram

Dual-In-Line Package



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Order Number DM74ALS151M or DM74ALS151N
See NS Package Number M16A or N16A

Function Table

Inputs				Outputs	
Select			Strobe	Y	W
C	B	A	S		
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

H = High Level, L = Low Level, X = Don't Care
D0 thru D7 = the level of the respective D input

Absolute Maximum Ratings

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM74ALS	0°C to +70°C
Storage Temperature Range	−65°C to +150°C
Typical θ_{JA}	
N Package	78.0°C/W
M Package	107.0°C/W

Note: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

Recommended Operating Conditions

Symbol	Parameter	DM74ALS151			Units
		Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Output Current			−2.6	mA
I_{OL}	Low Level Output Current			24	mA
T_A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

over recommended operating free-air temperature range. All typical values are measured at V_{CC} = 5V, T_A = 25°C.

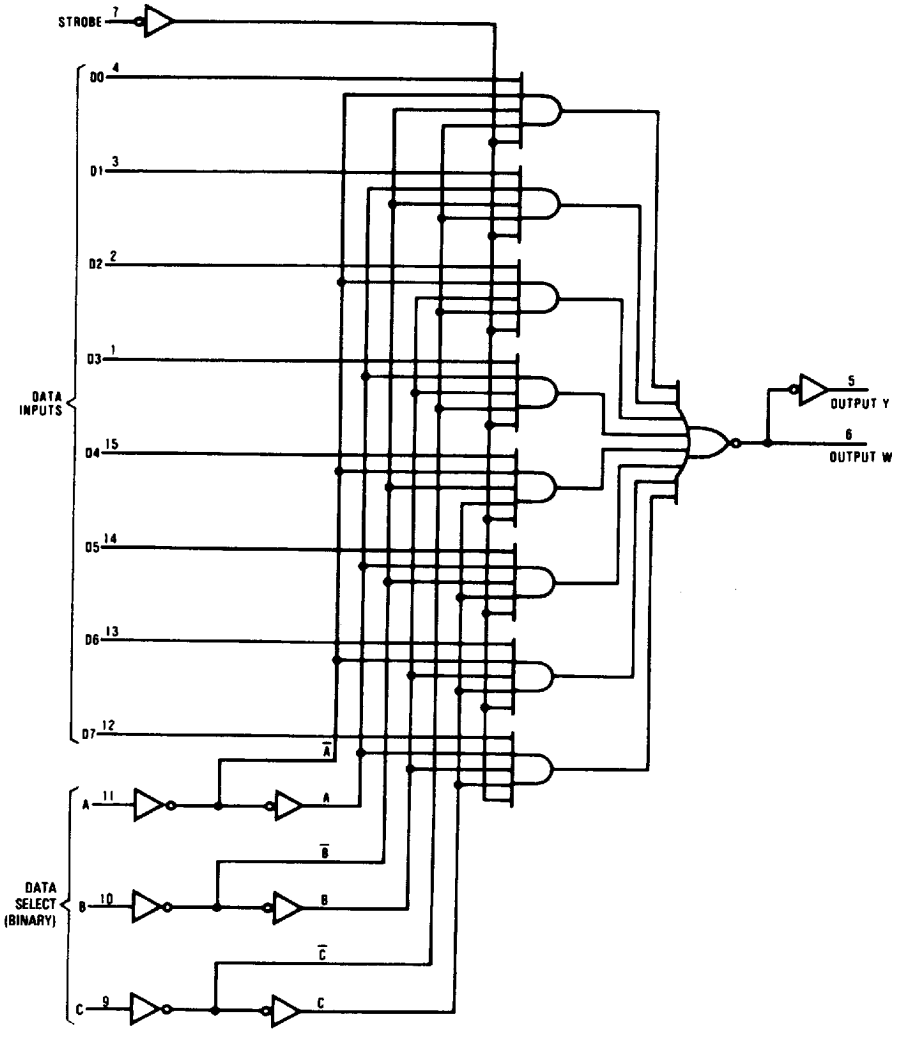
Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{IK}	Input Clamp Voltage	V_{CC} = 4.5V, I_{IN} = −18 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = 4.5V, I_{OH} = Max		2.4	3.2		V
		I_{OH} = −400 μA, V_{CC} = 4.5V to 5.5V		V_{CC} − 2			V
V_{OL}	Low Level Output Voltage	V_{CC} = 4.5V	74ALS I_{OL} = 24 mA		0.35	0.5	V
I_I	Input Current at Max Input Voltage	V_{CC} = 5.5V, V_{IN} = 7V				0.1	mA
I_{IH}	High Level Input Current	V_{CC} = 5.5V, V_{IN} = 2.7V				20	μA
I_{IL}	Low Level Input Current	V_{CC} = 5.5V, V_{IN} = 0.4V				−0.1	mA
I_O	Output Drive Current	V_{CC} = 5.5V, V_{OUT} = 2.25V		−30		−112	mA
I_{CC}	Supply Current	V_{CC} = 5.5V All Inputs = 4.5V			7.5	12	mA

Switching Characteristics over recommended operating free air temperature range (Note 1)

Symbol	Parameter	Conditions	From	To	DM74ALS151		Units
					Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	V_{CC} = 4.5V to 5.5V C_L = 50 pF R_L = 500Ω	Select	Y	4	18	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Select	Y	8	24	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		Select	W	7	24	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Select	W	7	23	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		Data	Y	3	10	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Data	Y	5	15	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		Data	W	3	15	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Data	W	4	15	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		Strobe	Y	4	18	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Strobe	Y	4	19	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		Strobe	W	5	19	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		Strobe	W	5	23	ns

Note 1: See Section 5 for test waveforms and output load.

Logic Diagram



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