National Semiconductor

DM54L51/DM74L51 Dual 2-Wide 2-Input, 2-Wide 3-Input AND-OR-INVERT Gates

General Description

This device contains two combinations of gates each of which performs the logic AND-OR-INVERT function.

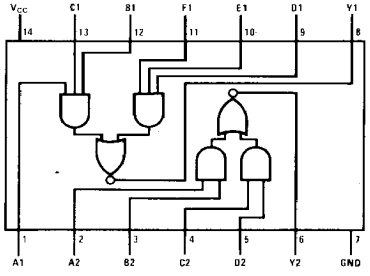
Absolute Maximum Ratings (Note 1)

Supply Voltage	8V
Input Voltage	5.5V
Storage Temperature Range	−65°C to 150°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device can not 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.

Connection Diagram

Dual-In-Line Package



TL/F/6625-1

DM54L51 (J) DM74L51 (N)

Function Table

$$Y1 = \overline{[(A1)(B1)(C1)] + [(CD1)(E1)(F1)]}$$

Inputs						Output
A1	B1	C1	D1	E1	F1	Y1
H	H	H	X	X	X	L
X	X	X	H	H	H	L
Other Combinations						H

$$Y2 = \overline{[(A2)(B2)] + [(C2)(D2)]}$$

Inputs				Output
A2	B2	C2	D2	Y2
H	H	X	X	L
X	X	H	H	L
All other combinations				H

H = High Logic Level
L = Low Logic Level
X = Either Low or High Logic Level

Recommended Operating Conditions

Symbol	Parameter	DM54L51			DM74L51			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			2			V
V_{IL}	Low Level Input Voltage			0.7			0.7	V
I_{OH}	High Level Output Current			−0.2			−0.2	mA
I_{OL}	Low Level Output Current			2			3.6	mA
T_A	Free Air Operating Temperature	−55		125	0		70	°C

Electrical Characteristics over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ (Note 1)	Max	Units
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max V_{IL} = Max, V_{IH} = Min		2.4	3.3		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min I_{OL} = Max V_{IH} = Min	DM54		0.15	0.3	V
			DM74		0.2	0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V				0.1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4V				10	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.3V				−0.18	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	DM54	−3		−15	mA
			DM74	−3		−15	
I_{CCH}	Supply Current With Outputs High	V_{CC} = Max			0.44	0.8	mA
I_{CCL}	Supply Current With Outputs Low	V_{CC} = Max			0.76	1.3	mA

Switching Characteristics at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

Parameter	Conditions	R_L = 4 kΩ C_L = 50 pF			Units
		Min	Typ	Max	
t_{PLH} Propagation Delay Time Low to High Level Output			50	90	ns
t_{PHL} Propagation Delay Time High to Low Level Output			35	60	ns

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time.

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