



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

General Description

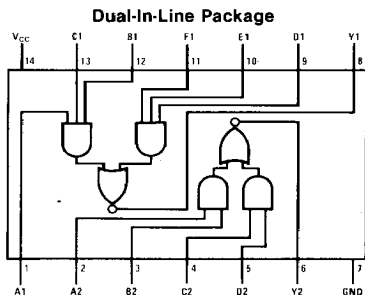
This device contains two combinations of gates each of which performs the logic AND-OR-INVERT function.

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



TL/F/6625-1

DM54L51 (J) DM74L51 (N)

Function Table

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

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

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

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

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

Parameter	Conditions	$R_L = 4\text{ k}\Omega$ $C_L = 50\text{ pF}$			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 $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.

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