March 1998

FAIRCHILD SEMICONDUCTOR™

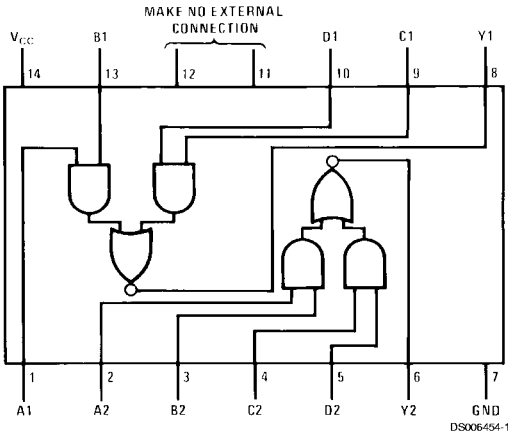
DM74S51
Dual 2-Wide 2-Input AND-OR-INVERT Gates

General Description

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

Connection Diagram

Dual-In-Line Package



Order Number DM74S51N
See Package Number N14A

Function Table

$$Y = \overline{AB + CD}$$

Inputs				Output
A	B	C	D	Y
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

Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
DM74S	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Recommended Operating Conditions

Symbol	Parameter	DM74S51			Units
		Min	Nom	Max	
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Output Current			−1	mA
I_{OL}	Low Level Output Current			20	mA
T_A	Free Air Operating Temperature	0		70	°C

Note 1: *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.*

Electrical Characteristics

over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ (Note 2)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −18 mA				−1.2	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	DM74	2.7	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min				0.5	V
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 5.5V				1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V				50	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.5V				−2	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 3)		−40		−100	mA
I_{CCH}	Supply Current with Outputs High	V_{CC} = Max			8.2	17.8	mA
I_{CCL}	Supply Current with Outputs Low	V_{CC} = Max			14	22	mA

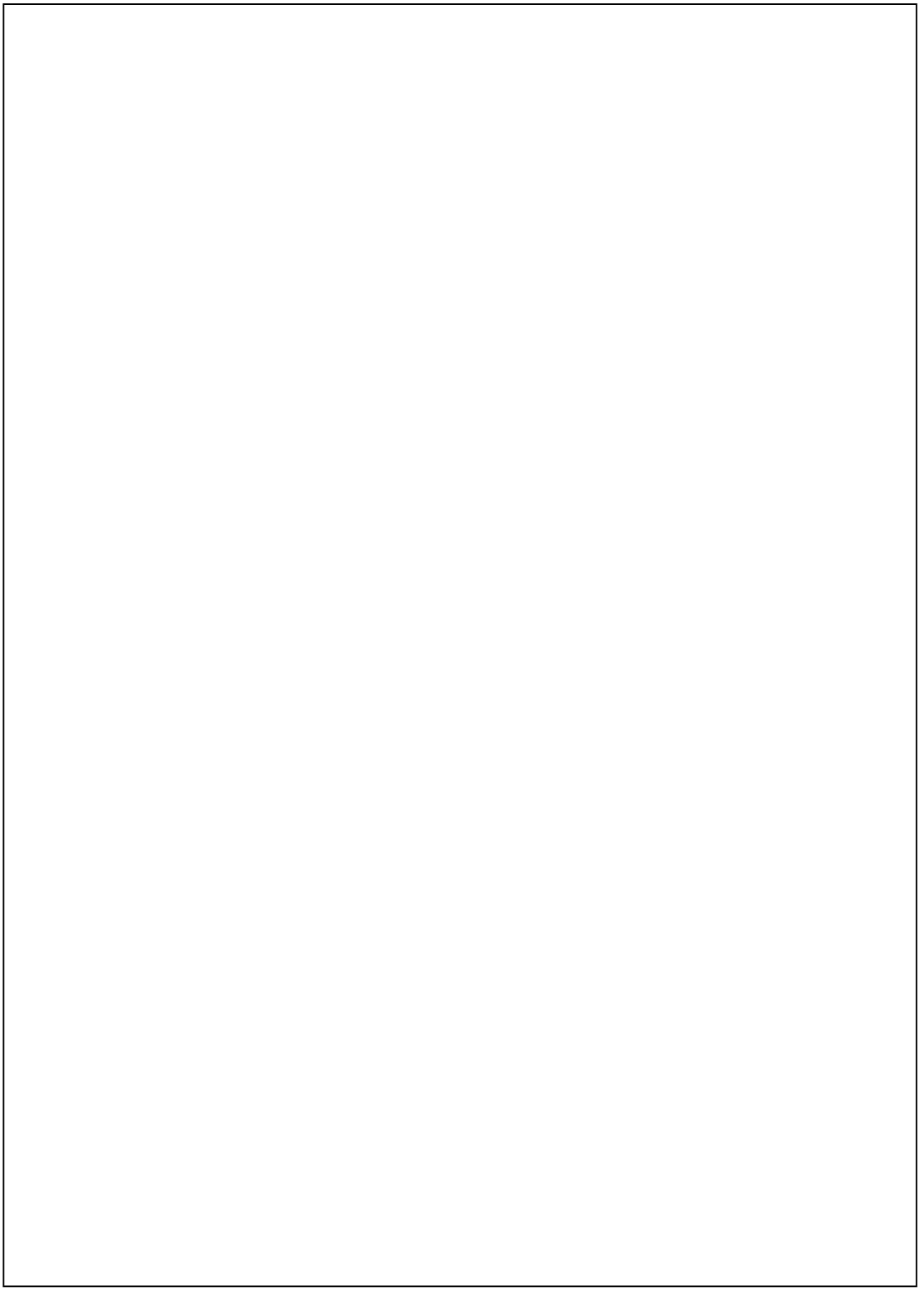
Switching Characteristics

at V_{CC} = 5V and T_A = 25°C

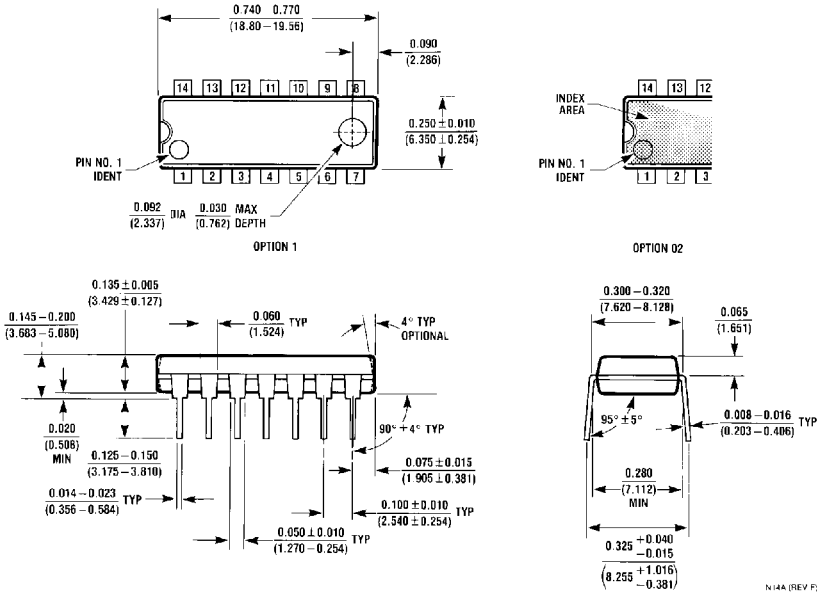
Symbol	Parameter	R_L = 280Ω				Units
		C_L = 15 pF		C_L = 50 pF		
		Min	Max	Min	Max	
t_{PLH}	Propagation Delay Time Low to High Level Output	2	5.5	3	8	ns
t_{PHL}	Propagation Delay Time High to Low Level Output	2	5.5	3	8	ns

Note 2: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 3: Not more than one output should be shorted at a time, and the duration should not exceed one second.



Physical Dimensions inches (millimeters) unless otherwise noted



14-Lead Molded Dual-In-Line Package (N)
Order Number DM74S51N
Package Number N14A

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