

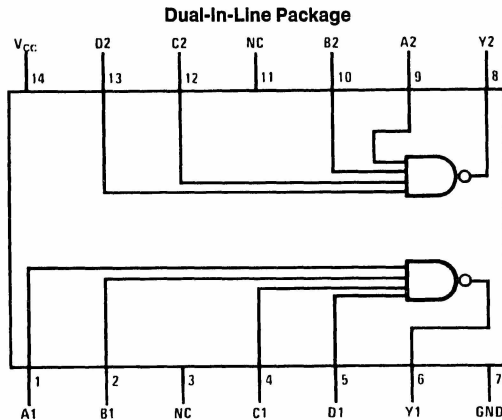


DM54S40/DM74S40 Dual 4-Input NAND Buffers

General Description

This device contains two independent gates each of which performs the logic NAND function.

Connection Diagram



TL/F/6453-1

Order Number DM54S40J, DM54S40W or DM74S40N
See NS Package Number J14A, N14A or W16B

Function Table

$$Y = \overline{ABCD}$$

Inputs				Output
A	B	C	D	Y
X	X	X	L	H
X	X	L	X	H
X	L	X	X	H
L	X	X	X	H
H	H	H	H	L

H = High Logic Level

L = Low Logic Level

X = Either Low or High Logic Level

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	5.5V
Operating Free Air Temperature Range	
DM54S	−55°C to +125°C
DM74S	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

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	DM54S40			DM74S40			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			0.8			0.8	V
I _{OH}	High Level Output Current			−3			−3	mA
I _{OL}	Low Level Output Current			60			60	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 _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	DM54	2.5	3.4	V
			DM74	2.7	3.4	
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			100	μA
I _{IL}	Low Level Input Current	V _{CC} = Max, V _I = 0.5V			−4	mA
I _{OS}	Short Circuit Output Current	V _{CC} = Max (Note 2)	DM54	−50	−225	mA
			DM74	−50	−225	
I _{CC} H	Supply Current with Outputs High	V _{CC} = Max		10	18	mA
I _{CC} L	Supply Current with Outputs Low	V _{CC} = Max		25	44	mA

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

Symbol	Parameter	R _L = 93Ω				Units
		C _L = 50 pF		C _L = 150 pF		
		Min	Max	Min	Max	
t _{PLH}	Propagation Delay Time Low to High Level Output	2	6.5	3	9	ns
t _{PHL}	Propagation Delay Time High to Low Level Output	2	6.5	3	9	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, and the duration should not exceed one second.