

## DM54L20/DM74L20 Dual 4-Input NAND Gates

### General Description

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

Operating Free Air Temperature Range

DM54L -55°C to +125°C  
DM74L 0°C to +70°C

Storage Temperature Range

-65°C to +150°C

### Absolute Maximum Ratings (Note)

Specifications for Military/Aerospace products are not contained in this datasheet. Refer to the associated reliability electrical test specifications document.

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.

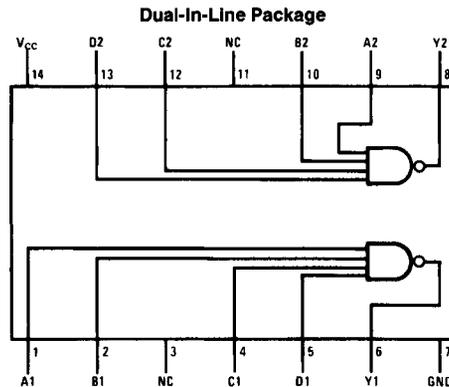
Supply Voltage

8V

Input Voltage

5.5V

### Connection Diagram



TL/F/6621-1

Order Number DM54L20J or DM74L20N  
See NS Package Number J14A or N14A

### 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

## Recommended Operating Conditions

Symbol	Parameter	DM54L20			DM74L20			Units
		Min	Nom	Max	Min	Nom	Max	
V <sub>CC</sub>	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V <sub>IH</sub>	High Level Input Voltage	2			2			V
V <sub>IL</sub>	Low Level Input Voltage			0.7			0.7	V
I <sub>OH</sub>	High Level Output Current			-0.2			-0.2	mA
I <sub>OL</sub>	Low Level Output Current			2			3.6	mA
T <sub>A</sub>	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 <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OH</sub> = Max V <sub>IL</sub> = Max	2.4	3.3		V
V <sub>OL</sub>	Low Voltage Output Voltage	V <sub>CC</sub> = Min I <sub>OL</sub> = Max V <sub>IH</sub> = Min	DM54	0.15	0.3	V
			DM74	0.2	0.4	
I <sub>I</sub>	Input Current @ Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			0.1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			10	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.3V			-0.18	mA
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	DM54	-3	-15	mA
			DM74	-3	-15	
I <sub>CCH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max		0.22	0.4	mA
I <sub>CCL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max		0.58	1.02	mA

## Switching Characteristics at V<sub>CC</sub> = 5V and T<sub>A</sub> = 25°C (See Section 1 for Test Waveforms and Output Load)

Symbol	Parameter	Conditions	Min	Max	Units
t <sub>PLH</sub>	Propagation Delay Time Low to High Level Output	R <sub>L</sub> = 4 kΩ, C <sub>L</sub> = 50 pF		60	ns
t <sub>PHL</sub>	Propagation Delay Time High to Low Level Output			60	ns

**Note 1:** All typicals are at V<sub>CC</sub> = 5V, T<sub>A</sub> 25°C.

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