



## DM5453/DM7453 Expandable 4-Wide 2-Input AND-OR-INVERT Gates

### General Description

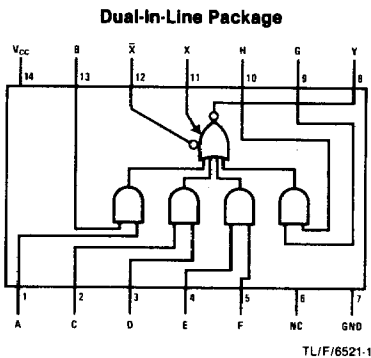
This device contains a combination of gates which performs the logic AND-OR-INVERT function.

### Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
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



DM5453 (J) DM7453 (N)

### Function Table

$$Y = \overline{AB + CD + EF + GH + X}$$

Inputs									Output
A	B	C	D	E	F	G	H	X	Y
H	H	Y	Y	Y	Y	Y	Y	Y	L
Y	Y	H	H	Y	Y	Y	Y	Y	L
Y	Y	Y	Y	H	H	Y	Y	Y	L
Y	Y	Y	Y	Y	Y	H	H	Y	L
Y	Y	Y	Y	Y	Y	Y	Y	H	L
All Other Combinations									H

H = High Logic Level

L = Low Logic Level

Y = Either Low or High Logic Level

## Recommended Operating Conditions

Sym	Parameter	DM5453			DM7453			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			0.8			0.8	V
I <sub>OH</sub>	High Level Output Current			-0.4			-0.4	mA
I <sub>OL</sub>	Low Level Output Current			16			16	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)

Sym	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = Min, I <sub>I</sub> = -12 mA			-1.5	V
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	3.4		V
		I <sub>X</sub> = 150 μA I <sub>X̄</sub> = -150 μA I <sub>OH</sub> = Max	DM54	2.4	3.4	
		I <sub>X</sub> = 270 μA I <sub>X̄</sub> = -270 μA I <sub>OH</sub> = Max	DM74	2.4	3.4	
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = Min, I <sub>OL</sub> = Max V <sub>IH</sub> = Min		0.2	0.4	V
		I <sub>X</sub> + I <sub>X̄</sub> = 300 μA R <sub>XX</sub> = 138Ω I <sub>OL</sub> = Max	DM54		0.2	0.4
		I <sub>X</sub> + I <sub>X̄</sub> = 430 μA R <sub>XX</sub> = 130Ω I <sub>OL</sub> = Max	DM74		0.2	0.4
V <sub>BEQ</sub>	Base-Emitter Voltage of Output Transistor Q	I <sub>X</sub> + I <sub>X̄</sub> = 410 μA R <sub>XX</sub> = 0 I <sub>OL</sub> = 16 mA	DM54		1.1	V
		I <sub>X</sub> + I <sub>X̄</sub> = 620 μA R <sub>XX</sub> = 0 I <sub>OL</sub> = 16 mA	DM74		1	
I <sub>X̄</sub>	Expander Current	V <sub>XX</sub> = 0.4V I <sub>OL</sub> = 16 mA	DM54		-2.9	mA
			DM74		-3.1	
I <sub>I</sub>	Input Current@Max Input Voltage	V <sub>CC</sub> = Max, V <sub>I</sub> = 5.5V			1	mA
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 2.4V			40	μA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = Max, V <sub>I</sub> = 0.4V			-1.6	mA

### Electrical Characteristics

(Continued) over recommended operating free air temperature  
(unless otherwise noted)

Parameter		Conditions	Min	Typ (Note 1)	Max	Units
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	DM54	- 20	- 55	mA
			DM74	- 18	- 55	
I <sub>CCH</sub>	Supply Current With Outputs High	V <sub>CC</sub> = Max		4	8	mA
I <sub>CCL</sub>	Supply Current With Outputs Low	V <sub>CC</sub> = Max		5.1	9.5	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)

Parameter	Conditions	C <sub>L</sub> = 15 pF R <sub>L</sub> = 400Ω			Units
		Min	Typ	Max	
t <sub>PLH</sub> Propagation Delay Time Low to High Level Output	(Expander Pins Open)		13	22	ns
t <sub>PHL</sub> Propagation Delay Time High to Low Level Output			8	15	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.