

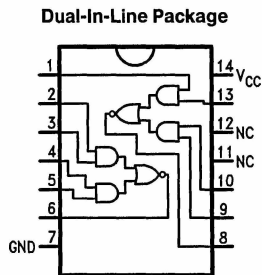


## 5451/DM7451 Dual 2-Wide, 2-Input AOI Gate

### General Description

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

### Connection Diagram



TL/F/9779-1

**Order Number 5451DMQB, 5451FMQB or DM7451N**  
**See NS Package Number J14A, N14A or W14B**

## 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	
54	–55°C to +125°C
DM74	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	5451			DM7451			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			–0.8			–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 range (unless otherwise noted)

Symbol	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
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>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
I <sub>OS</sub>	Short Circuit Output Current	V <sub>CC</sub> = Max (Note 2)	54 DM74	–20 –18	–55 –57	mA
I <sub>CCH</sub>	Supply Current with Outputs High	V <sub>CC</sub> = Max			8	mA
I <sub>CCL</sub>	Supply Current with Outputs Low	V <sub>CC</sub> = Max			14	mA

# Switching Characteristics

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

Symbol	Parameter	Conditions	Min	Max	Units
$t_{PLH}$	Propagation Delay Time Low to High Level Output	$C_L = 15\text{ pF}$ $R_L = 400\Omega$		22	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output			15	ns

**Note 1:** All typicals are at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

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