



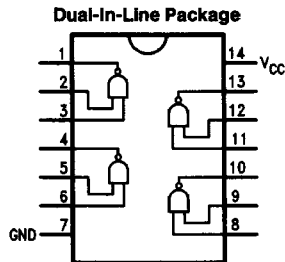
## DM96101

### Quad 2-Input Positive NAND Buffer with Open-Collector Output

#### General Description

The DM96101 is similar to the 54/7439, except that the outputs are specified at three levels of  $I_{OL}$ ; in the HIGH state the  $I_{OH}$  current is specified at two levels of  $V_{OH}$ . During switching transitions, output current change rate is typically 4.0 mA/ns.

#### Connection Diagram



TL/F/9799-1

**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	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	Min	Nom	Max	Units
$V_{CC}$	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			-0.05	mA
$I_{OL}$	Low Level Output Current			16	mA
$T_A$	Free Air Operating Temperature	0		70	°C

**Electrical Characteristics**

Over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
$V_I$	Input Clamp Voltage	$V_{CC} = \text{Min}, I_I = -12 \text{ mA}$			-1.5	V
$V_{OH}$	High Level Output Voltage	$V_{CC} = \text{Min}, I_{OH} = \text{Max}$ $V_{IL} = \text{Max}$	2.4	3.4		V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = \text{Min},$ $V_{IH} = V_{IN}$	$I_{OL} = 48 \text{ mA}$		0.4	V
			$I_{OL} = 60 \text{ mA}$		0.5	
			$I_{OL} = 80 \text{ mA}$		0.6	
$I_I$	Input Current @ Max Input Voltage	$V_{CC} = \text{Max}, V_I = 5.5V$			1	mA
$I_{IH}$	High Level Input Current	$V_{CC} = \text{Max}$	$V_{IN} = 2.4V$		40	$\mu\text{A}$
			$V_{IN} = 5.5V$		1000	
$I_{IL}$	Low Level Input Current	$V_{CC} = \text{Max}, V_{IN} = 0.4V$			-1.6	mA
$I_{OS}$	Short Circuit Output Current	$V_{CC} = \text{Max}$ (Note 2)	-18		-57	mA
$I_{CCH}$	Supply Current with Outputs High	$V_{CC} = \text{Max}, V_{IN} = 0V$			8.5	mA
$I_{CCL}$	Supply Current with Outputs Low	$V_{CC} = \text{Max}, V_{IN} = \text{Open}$			54	mA

**Switching Characteristics** at  $V_{CC} = 5V$  and  $T_A = 25^\circ\text{C}$  (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	$C_L = 45 \text{ pF}$ $R_L = 120\Omega$		22	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output			25	ns

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

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