

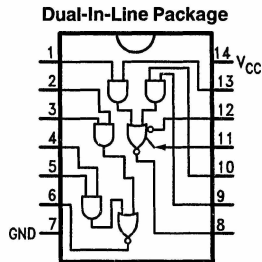


DM7450 Expandable Dual 2-Wide 2-Input AND-OR-INVERT Gate

General Description

This device contains two independent combinations of gates, each of which perform the logic AND-OR-INVERT function. One set of gates has an expander node.

Connection Diagram



TL/F/9778-1

Order Number DM7450N
See NS Package Number N14A

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 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 | DM7450 | | | Units |
|-----------------|--------------------------------|--------|-----|------|-------|
| | | Min | Nom | Max | |
| 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 | | | −0.4 | 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} = Min, I _I = −12 mA | | | −1.5 | V |
| V _{OH} | High Level Output Voltage | V _{CC} = Min, I _{OH} = −400 μA V _{IL} = Max | 2.4 | 3.4 | | V |
| V _{OL} | Low Level Output Voltage | V _{CC} = Min, I _{OL} = Max V _{IH} = Max | | 0.2 | 0.4 | V |
| I _I | Input Current @ Max Input Voltage | V _{CC} = Max, V _I = 5.5V | | | 1 | mA |
| I _X | Expander Current | V _I = 0.4V, I _{OL} = 16 mA V _{CC} = Min, T _A = Min | | | 3.1 | mA |
| I _{IH} | High Level Input Current | V _{CC} = Max, V _I = 2.4V | | | 40 | μA |
| I _{IL} | Low Level Input Current | V _{CC} = Max, V _I = 0.4V | | | −1.6 | mA |
| I _{OS} | Short Circuit Output Current | V _{CC} = Max (Note 2) | −18 | | −57 | mA |
| I _{CC} H | Supply Current with Outputs High | V _{CC} = Max | | | 8 | mA |
| I _{CC} L | Supply Current with Outputs Low | V _{CC} = Max | | | 14 | mA |
| V _{BE(Q)} | Base-Emitter Voltage of Output Transistor Q | I _I = 0.62 mA I _{OL} = 16 mA R _I = 0Ω | | | 1.0 | V |

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.