

DM9016C Hex Inverters

General Description

The DM9016C device is designed to be used in existing systems as replacements for Fairchild 9000-type circuits. The DM9016C circuit offers several significant advantages over 9000 type circuits, some of which are:

- Input clamp diodes
- Output short-circuit current specified to guarantee the high-level impedance.
- Power-dissipation of DM9016C circuits is in most cases lower than that for the equivalent 9016 type.

The DM9016C circuit is characterized for operation over the industrial temperature range of 0°C to 75°C.

For the new designs, the 54/74 families of TTL circuits offer the industry's broadest choice of high-performance digital circuits. Series 54/74 pin-for-pin equivalent is available for the following SSI type:

DM9000C Series
DM9016C

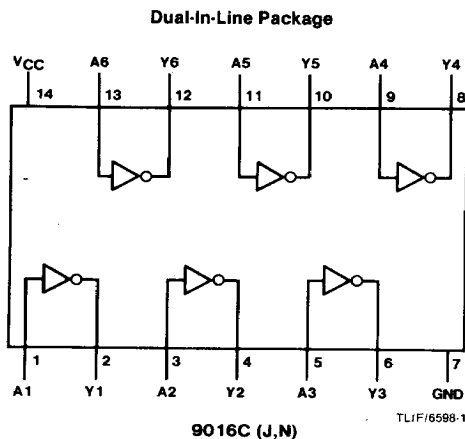
Equivalent Series 74
DM7404

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



Recommended Operating Conditions

| Symbol | Parameter | | DM9016C | | | Units |
|----------|--------------------------------|------|---------|-----|------|-------|
| | | | Min | Nom | Max | |
| V_{CC} | Supply Voltage | | 4.75 | 5 | 5.25 | V |
| V_{IH} | High Level Input Voltage | 0°C | 1.9 | | | V |
| | | 25°C | 1.8 | | | |
| | | 75°C | 1.6 | | | |
| V_{IL} | Low Level Input Voltage | | | | 0.85 | V |
| I_{OH} | High Level Output Current | | | | -1.2 | mA |
| I_{OL} | Low Level Output Current | | | | 50 | mA |
| T_A | Free Air Operating Temperature | | 0 | | 75 | °C |

Electrical Characteristics over recommended operating free air temperature (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 | | | V |
| V_{OL} | Low Level Output Voltage | $V_{CC} = \text{Max}$, $I_{OL} = 16 \text{ mA}$ $V_{IH} = \text{Min}$ | | | 0.45 | V |
| | | $I_{OL} = 14.1 \text{ mA}$ $V_{CC} = \text{Min}$ | | | 0.45 | |
| I_{IH} | High Level Input Current | $V_{CC} = \text{Max}$, $V_I = 4.5 \text{ V}$ Other Inputs at 0V | | | 60 | μA |
| I_{IL} | Low Level Input Current | $V_I = 4.5 \text{ V}$ Other Inputs at 5.25V | $V_{CC} = \text{Max}$ | | -1.6 | mA |
| | | | $V_{CC} = \text{Min}$ | | -1.41 | |
| I_{OS} | Short Circuit Output Current | $V_{CC} = \text{Max}$ (Note 2) | -18 | | -55 | mA |
| I_{CCH} | Supply Current With Outputs High | $V_{CC} = 5 \text{ V}$ | | | 1.7 | mA |
| I_{CCL} | Supply Current With Outputs Low | $V_{CC} = 5 \text{ V}$ | | | 6.1 | mA |

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

| Parameter | Conditions | $C_L = 15 \text{ pF}$ $R_L = 400\Omega$ | | | Units |
|--|------------|--|-----|-----|-------|
| | | Min | Typ | Max | |
| t_{PLH} Propagation Delay Time Low to High Level Output | | 3 | | 13 | ns |
| t_{PHL} Propagation Delay Time High to Low Level Output | | 3 | | 15 | ns |

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

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.