National Semiconductor

# DM74AS1805 Hex 2-Input NOR Driver

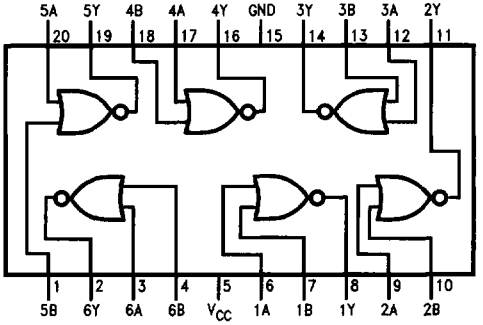
## General Description

These devices contain six independent 2-Input drivers each of which performs the logic NOR function. The 'AS1805 is equivalent to the 'AS805B but the supply voltage and ground pins are centered in the package. This positioning of the supply voltage and ground pins reduce the lead inductance of these pins. This reduction of lead inductance will minimize noise generated onto either the supply voltage or ground bus which is significant in high current switching applications.

## Features

- Switching specifications at 50 pF
- Switching specifications guaranteed over full temperature and $V_{CC}$ range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Centered $V_{CC}$ and GND configuration provides minimum lead inductance for high current switching applications
- High capacitive drive capability

## Connection Diagram




TL/F/8618–1

**Order Number DM74AS1805WM or DM74AS1805N**
**See NS Package Number M20B or N20A**

## Function Table

$$Y = \overline{A + B}$$

| INPUTS | | OUTPUT |
|---|---|---|
| A | B | Y |
| L | L | H |
| L | H | L |
| H | L | L |
| H | H | L |

## Absolute Maximum Ratings

| | |
|---|---|
| Supply Voltage | 7V |
| Input Voltage | 7V |
| Operating Free Air Temperature | 0°C to 70°C |
| Storage Temperature Range | −65°C to +150°C |
| Typical $\theta_{JA}$ | |
| N Package | 58.3°C/W |
| M Package | 154.0°C/W |

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 | 4.5 | 5 | 5.5 | V |
| $V_{IH}$ | High Level Input Voltage | 2 | | | V |
| $V_{IL}$ | Low Level Input Voltage | | | 0.8 | V |
| $I_{OH}$ | High Level Output Current | | | −48 | mA |
| $I_{OL}$ | Low Level Output Current | | | 48 | mA |
| $T_A$ | Operating Free Air Temperature Range | 0 | | 70 | °C |

## Electrical Characteristics over recommended operating free air temperature range

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| $V_{IK}$ | Input Clamp Voltage | $V_{CC}$ = 4.5V, $I_I$ = −18 mA | | | −1.2 | V |
| $V_{OH}$ | High Level Output Voltage | $I_{OH}$ = −2 mA, $V_{CC}$ = 4.5V to 5.5V | $V_{CC}$ −2 | | | V |
| | | $I_{OH}$ = −3 mA, $V_{CC}$ = 4.5V | 2.4 | 3.2 | | |
| | | $I_{OH}$ = Max, $V_{CC}$ = 4.5V | 2 | | | |
| $V_{OL}$ | Low Level Output Voltage | $V_{CC}$ = 4.5V, $I_{OL}$ = Max, $V_{IH}$ = 2V | | | 0.5 | V |
| $I_I$ | Input Current at Maximum Input Voltage | $V_{CC}$ = 5.5V, $V_I$ = 7V | | | 100 | μA |
| $I_{IH}$ | High Level Input Current | $V_{CC}$ = 5.5V, $V_I$ = 2.7V | | | 20 | μA |
| $I_{IL}$ | Low Level Input Current | $V_{CC}$ = 5.5V, $V_I$ = 0.4V | | | −500 | μA |
| $I_O$ | Output Drive Current | $V_{CC}$ = 5.5V, $V_O$ = 2.25V | −50 | −135 | −200 | mA |
| $I_{CCH}$ | Supply Current with Outputs High | $V_{CC}$ = 5.5V | | 6.5 | 10 | mA |
| $I_{CCL}$ | Supply Current with Outputs Low | $V_{CC}$ = 5.5V | | 20 | 32 | mA |

## Switching Characteristics over recommended operating free air temperature range (Note 1)

| Symbol | Parameter | Conditions (Note 1) | Min | Max | Units |
|---|---|---|---|---|---|
| $T_{PLH}$ | Propagation Delay Time Low to High Level Output | $V_{CC}$ = 4.5V to 5.5V<br>$R_L$ = 500Ω<br>$C_L$ = 50 pF | 1 | 4.3 | ns |
| $T_{PHL}$ | Propagation Delay Time High to Low Level Output | | 1 | 4.3 | ns |

**Note 1:** See Section 1 for test waveforms and output load.