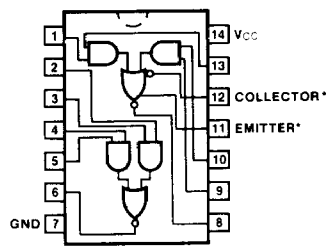


011612 101069
 9005 • 9008 011597
 9006 ✓ 011070

**EXTENDABLE AND-OR-INVERT GATES
 EXTENDER (9006)**

**CONNECTION DIAGRAMS
 PINOUT A**



*Four extenders (9006) may be tied to these terminals

Vcc = Pin 14
 GND = Pin 7

DESCRIPTION: — The 9005 and 9008 are AND-OR-INVERT gates which may be OR extended with the use of the 9006.

ORDERING CODE: See Section 9

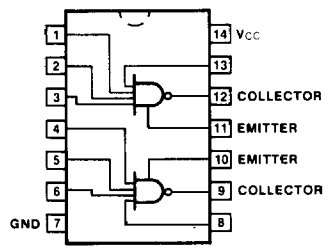
| PKGS | PIN OUT | COMMERCIAL GRADE | MILITARY GRADE | PKG TYPE |
|-----------------|---------|--|--|----------|
| | | Vcc = +5.0 V ±5%, TA = 0°C to +75°C | Vcc = +5.0 V ±10%, TA = -55°C to +125°C | |
| Ceramic DIP (D) | A | 9005DC | 9005DM | 6A |
| | B | 9006DC | 9006DM | |
| | C | 9008DC | 9008DM | |
| Flatpak (F) | A | 9005FC | 9005FM | 3I |
| | B | 9006FC | 9006FM | |
| | C | 9008FC | 9008FM | |

INPUT LOADING/FAN-OUT: See Section 3 for U.L. definitions

| PINS | 9005 (U.L.) HIGH/LOW | 9006 (U.L.) HIGH/LOW | 9008 (U.L.) HIGH/LOW |
|----------------------------|-------------------------|-------------------------|-------------------------|
| Non-extendable Gate Inputs | 1.5/1.0 | | |
| Extendable Gate Inputs | 2.25/1.5 | | |
| All Inputs | | 2.25/1.5 | 2.25/1.5 |
| Outputs | 30/8.8 (33)/(8.5) | * | 30/8.8 (33)/(8.5) |

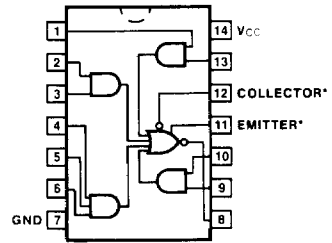
*Outputs on 9006 have open-emitter and collector

PINOUT B



Vcc = Pin 14
 GND = Pin 7

PINOUT C



*Four extender (9006) may be tied to these terminals

Vcc = Pin 14
 GND = Pin 7

9XXX Series

DC AND AC CHARACTERISTICS OVER COMMERCIAL TEMPERATURE RANGE: $V_{CC} = +5.0\text{ V} \pm 5\%$

| SYMBOL | PARAMETER | 0°C | | 25°C | | 75°C | | UNITS | CONDITIONS | |
|----------------------|---|------|-------|------|-------|------|-------|-------|---|---|
| | | Min | Max | Min | Max | Min | Max | | | |
| V_{IH} | Input HIGH Voltage | 1.9 | | 1.8 | | 1.6 | | V | Guaranteed Input HIGH Threshold Voltage | |
| V_{IL} | Input LOW Voltage | 0.85 | | 0.85 | | 0.85 | | V | Guaranteed Input LOW Threshold Voltage | |
| V_{OL} | Output LOW Voltage | 0.45 | | 0.45 | | 0.45 | | V | $V_{CC} = 5.25\text{ V}$, $I_{OL} = 16\text{ mA}$, | |
| | | 0.45 | | 0.45 | | 0.45 | | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 14.1\text{ mA}$ | |
| I_{IL} | Input LOW Current 9005 Non-Extendable Gate | -1.6 | | -1.6 | | -1.6 | | mA | $V_{CC} = \text{Max}$ $V_{CC} = \text{Min}$ | $V_{IN} = .45\text{ V}$ 5.25 V on Other Inputs |
| | Input LOW Current Extendable Gates and Extender | -2.4 | | -2.4 | | -2.4 | | | | |
| | | | -2.12 | | -2.12 | | -2.12 | | | |
| I_{CC} | Power Supply Current, ON 9005 Non-Extendable Gate | 7.7 | | 7.7 | | 7.7 | | mA | All Inputs Open | |
| | 9005 Extendable Gate | 13.6 | | 13.6 | | 13.6 | | | | |
| | 9008 | 17.7 | | 17.7 | | 17.7 | | | | |
| | Power Supply Current, OFF 9005 Non-Extendable Gate | 3.4 | | 3.4 | | 3.4 | | | | mA |
| 9005 Extendable Gate | 5.1 | | 5.1 | | 5.1 | | | | | |
| 9008 | 10.2 | | 10.2 | | 10.2 | | | | | |
| ΔI_{CC} | Extra Current Drain when one 9006 Extender is attached to a 9005 Gate ON | 2.05 | | 2.05 | | 2.05 | | mA | All Inputs HIGH | |
| | Extra Current Drain when one 9006 Extender is attached to a 9005 gate OFF | 2.54 | | 2.54 | | 2.54 | | | | mA |

DC AND AC CHARACTERISTICS OVER MILITARY TEMPERATURE RANGE: $V_{CC} = +5.0\text{ V} \pm 10\%$

| SYMBOL | PARAMETER | -55°C | | 25°C | | 125°C | | UNITS | CONDITIONS | |
|----------|---|-------|-------|------|-------|-------|-------|-------|--|---|
| | | Min | Max | Min | Max | Min | Max | | | |
| V_{IH} | Input HIGH Voltage | 2.0 | | 1.7 | | 1.4 | | V | Guaranteed Input HIGH Threshold Voltage | |
| V_{IL} | Input LOW Voltage | 0.8 | | 0.9 | | 0.8 | | V | Guaranteed Input LOW Threshold Voltage | |
| V_{OL} | Output LOW Voltage | 0.4 | | 0.4 | | 0.4 | | V | $V_{CC} = 5.5\text{ V}$, $I_{OL} = 17.6\text{ mA}$ | |
| | | 0.4 | | 0.4 | | 0.4 | | V | $V_{CC} = 4.5\text{ V}$, $I_{OL} = 13.6\text{ mA}$ | |
| I_{IL} | Input LOW Current 9005 Non-extendable Gate | -1.6 | | -1.6 | | -1.6 | | mA | $V_{CC} = \text{Max}$ $V_{CC} = \text{Min}$ | $V_{IN} = .4\text{ V}$ 5.5 V on Other Inputs |
| | Input LOW Current Extendable Gate and Extender | -2.4 | | -2.4 | | -2.4 | | | | |
| | | | -1.86 | | -1.86 | | -1.86 | | | |

NOTE:

Output characteristics above apply to a 9005 (both gates) or a 9008.

Input characteristics above apply to a 9005 (both gates) or a 9008 using either the internal gates or an external 9006 extender.

DC AND AC CHARACTERISTICS OVER MILITARY TEMPERATURE RANGE: $V_{CC} = +5.0 \text{ V} \pm 10\%$ (Cont'd)

| SYMBOL | PARAMETER | -55°C | | 25°C | | 125°C | | UNITS | CONDITIONS |
|----------------------|---|-------|-----|------|-----|-------|-----|-------|---|
| | | Min | Max | Min | Max | Min | Max | | |
| I _{CC} | Power Supply Current, ON | | | | | | | | |
| | 9005 Non-extendable Gate | 6.5 | | 6.5 | | 6.5 | | mA | All Inputs Open |
| | 9005 Extendable Gate | 11.3 | | 11.3 | | 11.3 | | | |
| | 9008 | 12.5 | | 12.5 | | 12.5 | | | |
| | Power Supply Current, OFF | | | | | | | | |
| | 9005 Non-extendable Gate | 3.1 | | 3.1 | | 3.1 | | mA | All Inputs Except Extender Inputs Gnd |
| 9005 Extendable Gate | 4.7 | | 4.7 | | 4.7 | | | | |
| 9008 | 9.4 | | 9.4 | | 9.4 | | | | |
| ΔI _{CC} | Extra Current Drain from one 9006 Extender Gate ON | 1.61 | | 1.61 | | 1.61 | | mA | All Inputs HIGH |
| | Extra Current Drain from one 9006 Extender Gate OFF | 2.35 | | 2.35 | | 2.35 | | mA | All Inputs Gnd 9006 Attached to a 9005 |

NOTE:

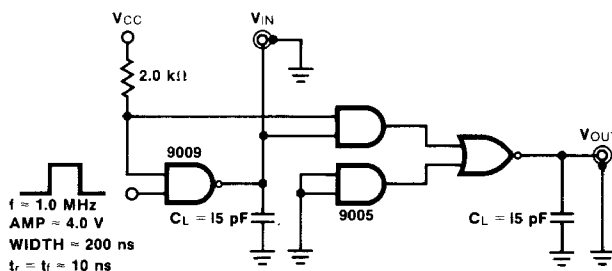
Output characteristics apply to a 9005 (both gates) or a 9008.

Input characteristics apply to a 9005 (both gates) or a 9008 using either the internal gates or an external 9006 extender.

SWITCHING CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

| SYMBOL | LIMITS | | UNITS | TEST CONDITIONS |
|-------------------|--------|-----|-------|--|
| | Min | Max | | |
| t _{PLH} | 3.0 | 12 | ns | $V_{CC} = 5.0 \text{ V}$, $C_L = 15 \text{ pF}$ 9005 Non-extendable Gate Only, See Figure a |
| t _{PHL} | 3.0 | 14 | | |
| t _{PLH} | 3.0 | 15 | ns | $V_{CC} = 5.0 \text{ V}$, $C_L = 15 \text{ pF}$, $C_N = 5.0 \text{ pF}$ 9005 Extendable Gate and 9008, See Figure b |
| t _{PHL} | 3.0 | 12 | | |
| Δt _{PLH} | -2.0 | 4.0 | ns | 9006 Only. The 9006 is tested by measuring its propagation time through the 9005. The delay readings shall not exceed the 9005 readings by the specified amount. See Figure c |
| Δt _{PHL} | -2.0 | 4.0 | | |

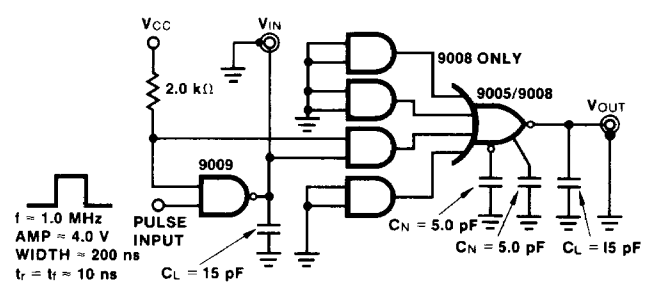
SWITCHING CHARACTERISTICS TEST CIRCUITS



Note: Capacitance includes probe and jig capacitance

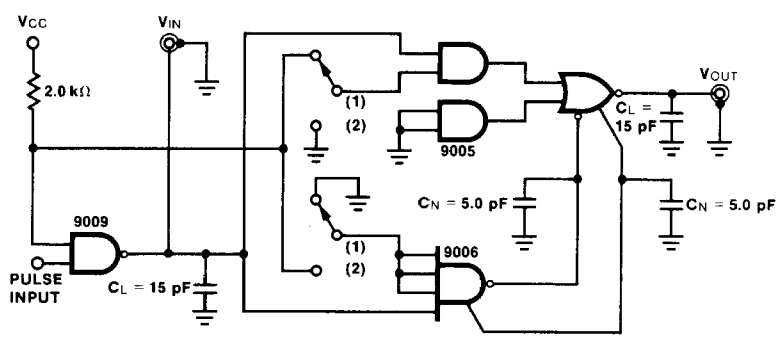
Fig. a 9005 Non-Extendable Gate

SWITCHING CHARACTERISTICS (Cont'd) TEST CIRCUITS



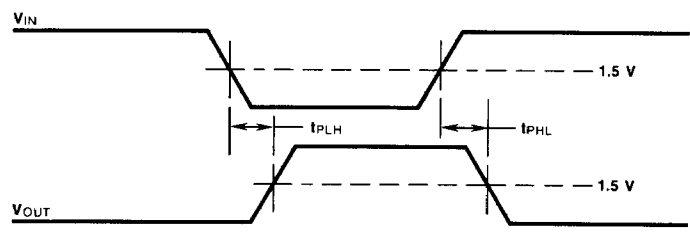
Note: Capacitance includes probe and jig capacitance

Fig. b 9005 or 9008 Extendable Gate



Note: Capacitance includes probe and jig capacitance

Fig. c 9006 Extender



NOTES:
With switch in position (1) measure delay of 9005. With switch in position (2) measure delay (9005) + Δdelay (9006). Capacitances include probe and jig capacitances.

Fig. d Switching Waveform