

**MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA**

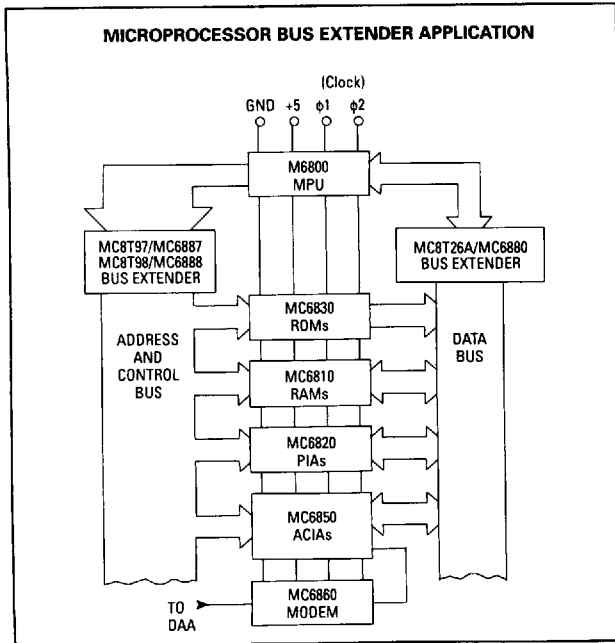
HEX THREE-STATE BUFFER INVERTERS

This series of devices combines three features usually found desirable in bus-oriented systems: 1) High impedance logic inputs insure that these devices do not seriously load the bus; 2) Three-state logic configuration allows buffers not being utilized to be effectively removed from the bus; 3) Schottky technology allows high-speed operation.

The noninverting MC8T97/MC6887 and inverting MC8T98/MC6888 provide two Enable inputs — one controlling four buffers and the other controlling the remaining two buffers.

The units are well-suited for Address buffers on the MC6800 or similar microprocessor application.

- High Speed — 8.0 ns (Typ)
- Three-State Logic Configuration
- Single +5 V Power Supply Requirement
- Compatible with 74LS Logic or MC6800 Microprocessor Systems
- High Impedance PNP Inputs Assure Minimal Loading of the Bus



MC8T97 (MC6887)
MC8T98 (MC6888)

**HEX THREE-STATE
BUFFER/INVERTERS**

**MONOLITH SCHOTTKY
INTEGRATED CIRCUITS**

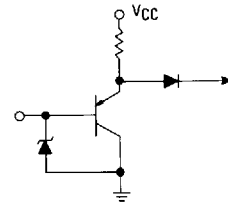


L SUFFIX
CERAMIC PACKAGE
CASE 620

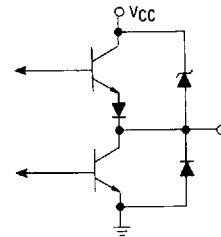


P SUFFIX
PLASTIC PACKAGE
CASE 648

INPUT EQUIVALENT CIRCUIT



OUTPUT EQUIVALENT CIRCUIT



ORDERING INFORMATION

(Temperature Range = 0 to + 75°C)

| Device | Alternate | Package |
|---------|-----------|-------------|
| MC8T97L | MC6887L | Ceramic DIP |
| MC8T98L | MC6888L | Ceramic DIP |
| MC8T97P | MC6887P | Plastic DIP |
| MC8T98P | MC6888P | Plastic DIP |

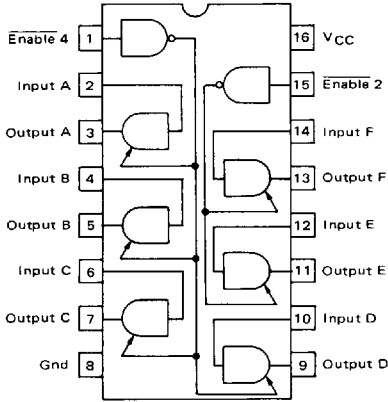
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MC8T97, MC8T98

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted.)

| Rating | Symbol | Value | Unit |
|-------------------------------------|------------------|-------------|-----------------|
| Power Supply Voltage | V _{CC} | 8.0 | V _{dc} |
| Input Voltage | V _I | 5.5 | V _{dc} |
| Operating Ambient Temperature Range | T _A | 0 to +75 | °C |
| Storage Temperature Range | T _{stg} | -65 to +150 | °C |
| Operating Junction Temperature | T _J | | °C |
| Plastic Package | | 150 | |
| Ceramic Package | | 175 | |

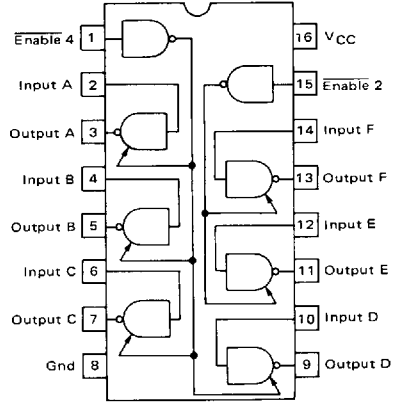
MC8T97/MC6887



| Enable | Input | Output |
|--------|-------|--------|
| L | L | L |
| L | H | H |
| H | X | Z |

L = Low Logic State
 H = High Logic State
 Z = Third (High Impedance) State
 X = Irrelevant

MC8T98/MC6888



| Enable | Input | Output |
|--------|-------|--------|
| L | L | H |
| L | H | L |
| H | X | Z |

MC8T97, MC8T98

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $0^{\circ}\text{C} \leq T_A \leq 75^{\circ}\text{C}$ and $4.75\text{ V} \leq V_{CC} \leq 5.25\text{ V}$)

| Characteristics | Symbol | Min | Typ | Max | Unit |
|---|-------------------------------------|-------------|-------------|-------------------|---------------|
| Input Voltage High Logic State ($V_{CC} = 4.75\text{ V}$, $T_A = 25^{\circ}\text{C}$) Low Logic State ($V_{CC} = 4.75\text{ V}$, $T_A = 25^{\circ}\text{C}$) | V_{IH} V_{IL} | 2.0 — | — — | — 0.8 | V |
| Input Current — High Logic State ($V_{CC} = 5.25\text{ V}$, $V_{IH} = 2.4\text{ V}$) Low Logic State ($V_{CC} = 5.25\text{ V}$, $V_{IL} = 0.5\text{ V}$, $V_{IL(E)} = 0.5\text{ V}$) High Impedance State ($V_{CC} = 5.25\text{ V}$, $V_{IL} = 0.5\text{ V}$, $V_{IH(E)} = 2.0\text{ V}$) | I_{IH} I_{IL} $I_{IH(E)}$ | — — — | — — — | 40 -400 -40 | μA |
| Output Voltage High Logic State ($V_{CC} = 4.75\text{ V}$, $I_{OH} = -5.2\text{ mA}$) Low Logic State ($I_{OL} = 48\text{ mA}$) | V_{OH} V_{OL} | 2.4 — | — — | — 0.5 | V |
| Output Voltage — High Impedance State ($V_{CC} = 5.25\text{ V}$, $V_{OH} = 2.4\text{ V}$) ($V_{CC} = 5.25\text{ V}$, $V_{OL} = 0.5\text{ V}$) | I_{OZ} | — — | — — | 40 -40 | μA |
| Output Short Circuit Current ($V_{CC} = 5.25\text{ V}$, $V_O = 0$, only one output can be shorted at a time) | I_{OS} | -40 | -80 | -115 | mA |
| Power Supply Current ($V_{CC} = 5.25\text{ V}$) MC8T97, MC6887 MC8T98, MC6888 | I_{CC} | — — | 65 59 | 98 89 | mA |
| Input Clamp Voltage ($V_{CC} = 4.75\text{ V}$, $I_{IC} = -12\text{ mA}$) | V_{IC} | — | — | -1.5 | V |
| Input Voltage ($I_I = 1.0\text{ mA}$) | V_I | 5.5 | — | — | V |
| Output V_{CC} Clamp Voltage ($V_{CC} = 0$, $I_{OC} = 12\text{ mA}$) | V_{OC} | — | — | 1.5 | V |
| Output Gnd Clamp Voltage ($V_{CC} = 0$, $I_{OC} = 12\text{ mA}$) | V_{OC} | — | — | -1.5 | V |

SWITCHING CHARACTERISTICS ($V_{CC} = 5.0\text{ V}$, $T_A = 25^{\circ}\text{C}$ unless otherwise noted.)

| Characteristic | Symbol | MC8T97 MC6887 | | | MC8T98 MC6888 | | | Unit |
|---|--------------|--------------------|---------------------|-------------------|--------------------|---------------------|-------------------|------|
| | | Min | Typ | Max | Min | Typ | Max | |
| Propagation Delay Time — High-to-Low State ($C_L = 50\text{ pF}$) ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{PHL} | 3.0 — — — | — 16 20 23 | 12 — — — | 4.0 — — — | — 15 18 22 | 11 — — — | ns |
| Propagation Delay Time — Low-to-High State ($C_L = 50\text{ pF}$) ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{PLH} | 3.0 — — — | — 25 33 42 | 13 — — — | 3.0 — — — | — 22 28 35 | 10 — — — | ns |
| Transition Time — High-to-Low State ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{THL} | — — — | 10 11 14 | — — — | — — — | 10 13 15 | — — — | ns |
| Transition Time — Low-to-High State ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{TLH} | — — — | 32 42 60 | — — — | — — — | 28 38 53 | — — — | ns |
| Propagation Delay Time — High State-to-Third State ($C_L = 5.0\text{ pF}$) | $t_{PHZ(E)}$ | — | — | 10 | — | — | 10 | ns |
| Propagation Delay Time — Low State-to-Third State ($C_L = 5.0\text{ pF}$) | $t_{PLZ(E)}$ | — | — | 12 | — | — | 16 | ns |
| Propagation Delay Time — Third State-to-High State ($C_L = 50\text{ pF}$) | $t_{PZH(E)}$ | — | — | 25 | — | — | 22 | ns |
| Propagation Delay Time — Third State-to-Low State ($C_L = 50\text{ pF}$) | $t_{PZL(E)}$ | — | — | 25 | — | — | 24 | ns |

MC8T97, MC8T98

FIGURE 1 – TEST CIRCUIT FOR SWITCHING CHARACTERISTICS

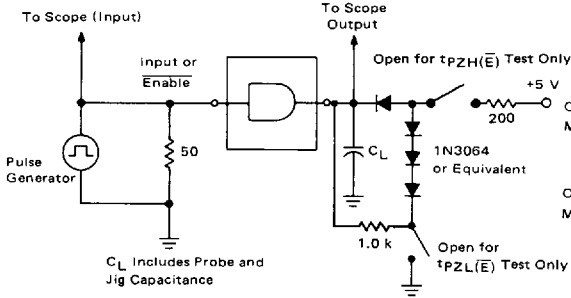


FIGURE 2 – WAVEFORMS FOR PROPAGATION DELAY TIMES INPUT TO OUTPUT

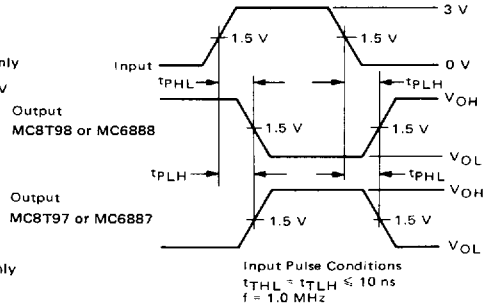
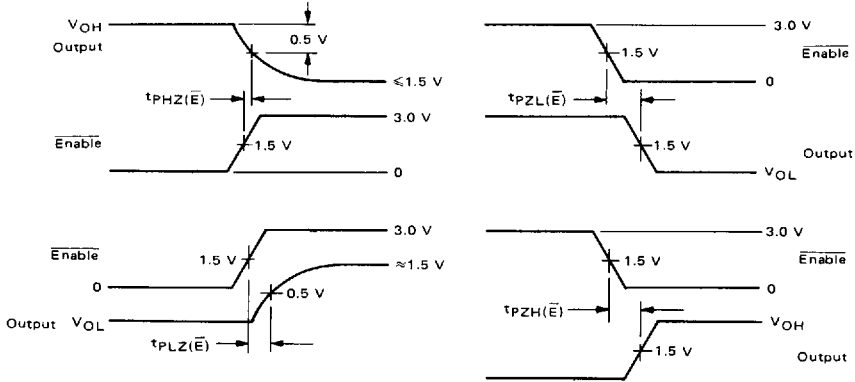


FIGURE 3 – WAVEFORMS FOR PROPAGATION DELAY TIMES – ENABLE TO OUTPUT



H = High-Logic State, L = Low-Logic State, Z = High Impedance State