



MOTOROLA

**MC8T95/MC6885
MC8T96/MC6886
MC8T97/MC6887
MC8T98/MC6888**

HEX THREE-STATE BUFFER INVERTERS

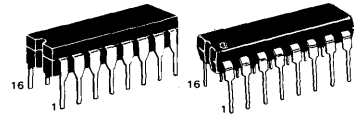
This series of devices combines three features usually found desirable in bus-oriented systems: 1) High impedance logic inputs insure that these devices do not seriously load the bus; 2) Three-state logic configuration allows buffers not being utilized to be effectively removed from the bus; 3) Schottky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

The devices differ in that the non-inverting MC8T95/MC6885 and inverting MC8T96/MC6886 provide a two-input Enable which controls all six buffers, while the non-inverting 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 M6800 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 M6800 Microprocessor Systems
- High Impedance PNP Inputs Assure Minimal Loading of the Bus

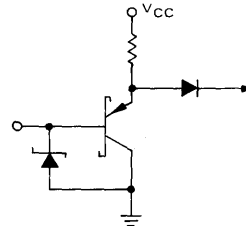
**HEX THREE-STATE
BUFFER/INVERTERS**



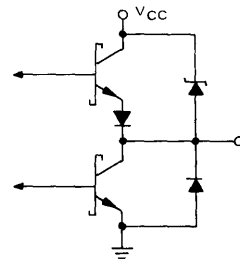
CASE 620

CASE 648

**INPUT EQUIVALENT
CIRCUIT**



**OUTPUT EQUIVALENT
CIRCUIT**

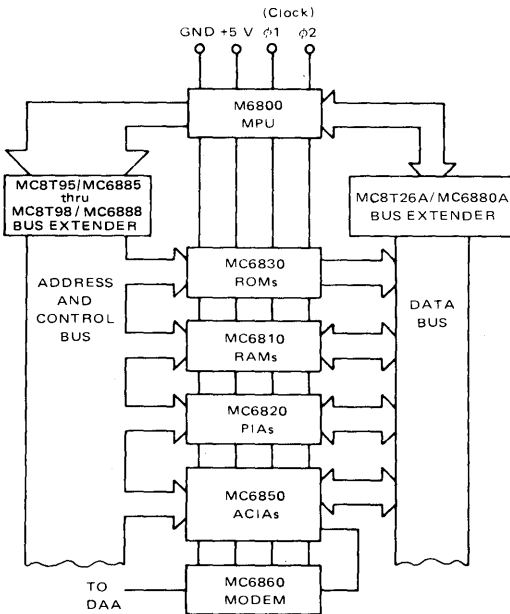


ORDERING INFORMATION

(Temperature Range for the following devices = 0 to +75°C)

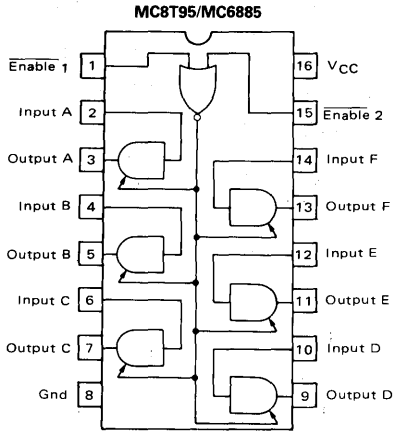
| DEVICE | ALTERNATE | PACKAGE |
|---------|-----------|-------------|
| MC8T95L | MC6885L | Ceramic DIP |
| MC8T96L | MC6886L | Ceramic DIP |
| MC8T97L | MC6887L | Ceramic DIP |
| MC8T98L | MC6888L | Ceramic DIP |
| MC8T95P | MC6885P | Plastic DIP |
| MC8T96P | MC6886P | Plastic DIP |
| MC8T97P | MC6887P | Plastic DIP |
| MC8T98P | MC6888P | Plastic DIP |

MICROPROCESSOR BUS EXTENDER APPLICATION

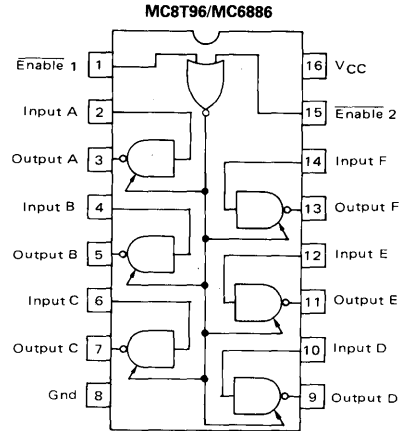


MC8T95-98/MC6885-88

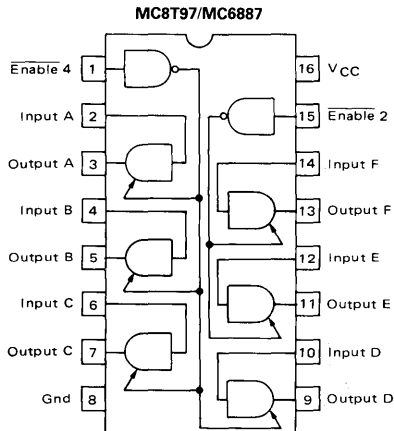
PIN CONNECTIONS AND TRUTH TABLES



| Enable 2 | Enable 1 | Input | Output |
|----------|----------|-------|--------|
| L | L | L | L |
| L | L | H | H |
| L | H | X | Z |
| H | L | X | Z |
| H | H | X | Z |

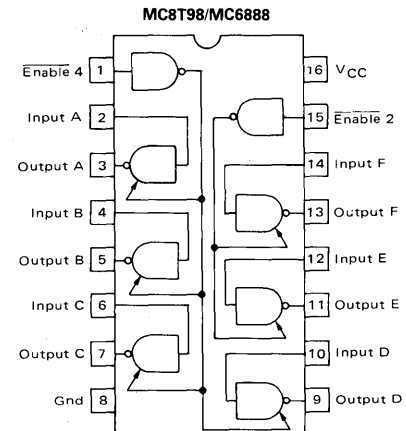


| Enable 2 | Enable 1 | Input | Output |
|----------|----------|-------|--------|
| L | L | L | H |
| L | L | H | L |
| L | H | X | Z |
| H | L | X | Z |
| H | H | X | Z |



| 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



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

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 | |

MC8T95-98/MC6885-88

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|-------------|-----|----------|-----------|---------------|
| Input Voltage – High Logic State ($V_{CC} = 4.75\text{ V}$, $T_A = 25^{\circ}\text{C}$) | V_{IH} | 2.0 | – | – | V |
| Input Voltage – Low Logic State ($V_{CC} = 4.75\text{ V}$, $T_A = 25^{\circ}\text{C}$) | V_{IL} | – | – | 0.8 | V |
| Input Current – High Logic State ($V_{CC} = 5.25\text{ V}$, $V_{IH} = 2.4\text{ V}$) | I_{IH} | – | – | 40 | μA |
| Input Current – Low Logic State ($V_{CC} = 5.25\text{ V}$, $V_{IL} = 0.5\text{ V}$, $V_{IL(E)} = 0.5\text{ V}$) | I_{IL} | – | – | -400 | μA |
| Input Current – High Impedance State ($V_{CC} = 5.25\text{ V}$, $V_{IL(I)} = 0.5\text{ V}$, $V_{IH(E)} = 2.0\text{ V}$) | $I_{IH(E)}$ | – | – | -40 | μA |
| Output Voltage – High Logic State ($V_{CC} = 4.75\text{ V}$, $I_{OH} = -5.2\text{ mA}$) | V_{OH} | 2.4 | – | – | V |
| Output Voltage – Low Logic State ($I_{OL} = 48\text{ mA}$) | V_{OL} | – | – | 0.5 | V |
| Output Current – 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 ($V_{CC} = 5.25\text{ V}$) | 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 |
| 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 |
| Input Voltage ($I_I = 1.0\text{ mA}$) | V_I | 5.5 | – | – | V |

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

| Characteristic | Symbol | MC8T95/97 MC6885/87 | | | MC8T96/98 MC6886/88 | | | 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 | – | 12 | 4.0 | – | 11 | ns |
| | | – | 16 | – | – | 15 | – | |
| | | – | 20 | – | – | 18 | – | |
| | | – | 23 | – | – | 22 | – | |
| 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 | – | 13 | 3.0 | – | 10 | ns |
| | | – | 25 | – | – | 22 | – | |
| | | – | 33 | – | – | 28 | – | |
| | | – | 42 | – | – | 35 | – | |
| Transition Time – High to Low State ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{THL} | – | 10 | – | – | 10 | – | ns |
| | | – | 11 | – | – | 13 | – | |
| | | – | 14 | – | – | 15 | – | |
| | | – | – | – | – | – | – | |
| Transition Time – Low to High State ($C_L = 250\text{ pF}$) ($C_L = 375\text{ pF}$) ($C_L = 500\text{ pF}$) | t_{TLH} | – | 32 | – | – | 28 | – | ns |
| | | – | 42 | – | – | 38 | – | |
| | | – | – | – | – | – | – | |
| | | – | 60 | – | – | 53 | – | |

3

MC8T95-98/MC6885-88

SWITCHING CHARACTERISTICS (V_{CC} = 5.0 V, T_A = 25°C unless otherwise noted.)

| Characteristic | Symbol | MC8T95/97 MC6885/87 | | | MC8T96/98 MC6886/88 | | | Unit |
|---|--------------------------------|------------------------|-----|-----|------------------------|-----|-----|------|
| | | Min | Typ | Max | Min | Typ | Max | |
| Propagation Delay Time – High State to Third State (C _L = 5.0 pF) | t _{PHZ} (\bar{E}) | – | – | 10 | – | – | 10 | ns |
| Propagation Delay Time – Low State to Third State (C _L = 5.0 pF) | t _{PLZ} (\bar{E}) | – | – | 12 | – | – | 16 | ns |
| Propagation Delay Time – Third State to High State (C _L = 50 pF) | t _{PZH} (\bar{E}) | – | – | 25 | – | – | 22 | ns |
| Propagation Delay Time – Third State to Low State (C _L = 50 pF) | t _{PZL} (\bar{E}) | – | – | 25 | – | – | 24 | ns |

FIGURE 1 – TEST CIRCUIT FOR SWITCHING CHARACTERISTICS

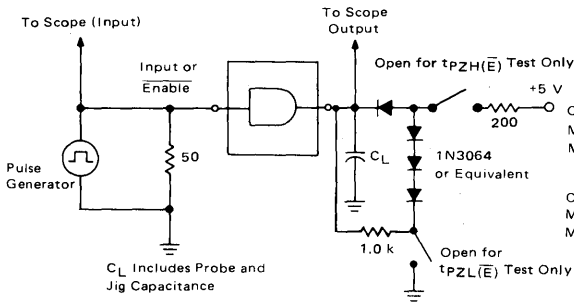


FIGURE 2 – WAVEFORMS FOR PROPAGATION DELAY TIMES INPUT TO OUTPUT

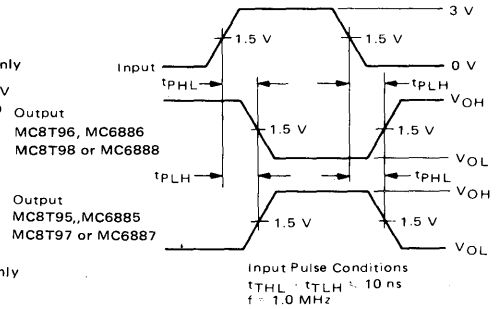
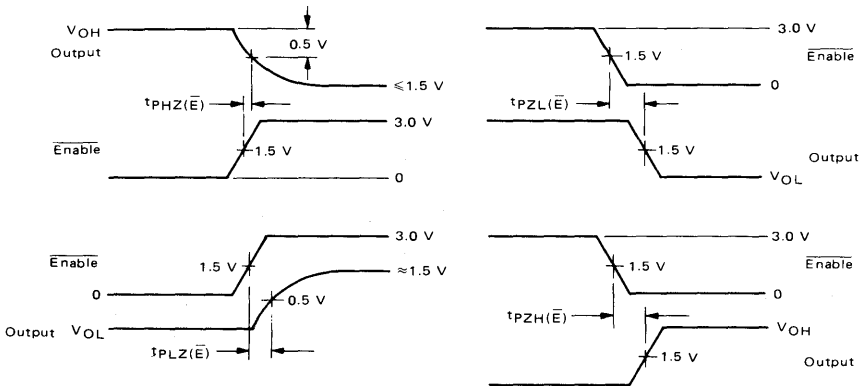


FIGURE 3 – WAVEFORMS FOR PROPAGATION DELAY TIMES – ENABLE TO OUTPUT



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

3

FIGURE 4 - ADDRESS MULTIPLEXER FOR 16-PIN 4K NMOS MEMORY

