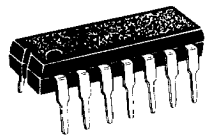
# MN4584B/MN4584BS

## Hex Schmitt Triggers

### ■ Description

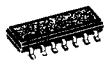
The MN4584B/S have hex waveform shaping circuits.
They are used when high noise immunity is desired, and as waveform-shaping circuits to make late rise and fall time input.
The MN4548B/S are equivalent to MOTOROLA MC14584B.

P-1



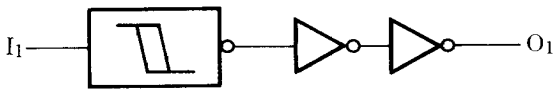
14-Pin • Plastic DIL Package

P-2

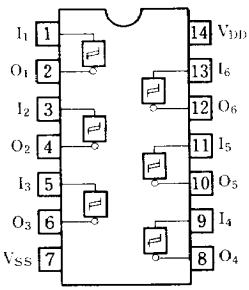


14-Pin • Panaflat Package (SO-14D)

### ■ Logic Diagram (1/6)




### Pin Configuration




### ■ Maximum Ratings (Ta=25℃)

| Item | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Supply Voltage | | $V_{DD}$ | −0.5~+18 | V |
| Input Voltage | | $V_I$ | −0.5~$V_{DD}$+0.5* | V |
| Output Voltage | | $V_O$ | −0.5~$V_{DD}$+0.5* | V |
| Peak Input · Output Current | | $\pm I_I$ | max. 10 | mA |
| Power Dissipation (per package) | Ta=−40~+60℃ | $P_D$ | max. 400 | mW |
| | Ta=+60~+85℃ | | Decrease up to 200mW rating at 8mW/°C | |
| Power Dissipation (per output terminal) | | $P_D$ | max. 100 | mW |
| Operating Ambient Temperature | | Topr | −40~+85 | ℃ |
| Storage Temperature | | Tstg | −65~+150 | ℃ |

* $V_{DD}$ + 0.5V should be under 18V

## ■ DC Characteristics ($V_{SS}$=0V)

| Item | $V_{DD}$ (V) | Symbol | Conditions | | Ta=−40℃ min. | Ta=−40℃ max. | Ta=25℃ min. | Ta=25℃ max. | Ta=85℃ min. | Ta=85℃ max. | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Quiescent Power Supply Current | 5 | $I_{DD}$ | $V_I$=$V_{SS}$ or $V_{DD}$ | | — | 1 | — | 1 | — | 7.5 | μA |
| | 10 | | | | — | 2 | — | 2 | — | 15 | |
| | 15 | | | | — | 4 | — | 4 | — | 30 | |
| Output Voltage Low Level | 5 | $V_{OL}$ | $V_I$=$V_{SS}$ or $V_{DD}$ $\|I_O\|$<1μA | | — | 0.05 | — | 0.05 | — | 0.05 | V |
| | 10 | | | | — | 0.05 | — | 0.05 | — | 0.05 | |
| | 15 | | | | — | 0.05 | — | 0.05 | — | 0.05 | |
| Output Voltage High Level | 5 | $V_{OH}$ | $V_I$=$V_{SS}$ or $V_{DD}$ $\|I_O\|$<1μA | | 4.95 | — | 4.95 | — | 4.95 | — | V |
| | 10 | | | | 9.95 | — | 9.95 | — | 9.95 | — | |
| | 15 | | | | 14.95 | — | 14.95 | — | 14.95 | — | |
| Input Voltage Low Level | 5 | $V_{IL}$ | $\|I_O\|$<1μA | $V_O$=0.5V or 4.5V | — | 1.5 | — | 1.5 | — | 1.5 | V |
| | 10 | | | $V_O$=1V or 9V | — | 3 | — | 3 | — | 3 | |
| | 15 | | | $V_O$=1.5V or 13.5V | — | 4 | — | 4 | — | 4 | |
| Input Voltage High Level | 5 | $V_{IH}$ | $\|I_O\|$<1μA | $V_O$=0.5V or 4.5V | 3.5 | — | 3.5 | — | 3.5 | — | V |
| | 10 | | | $V_O$=1V or 9V | 7 | — | 7 | — | 7 | — | |
| | 15 | | | $V_O$=1.5V or 13.5V | 11 | — | 11 | — | 11 | — | |
| Output Current Low Level | 5 | $I_{OL}$ | $V_O$=0.4V, $V_I$=0 or 5V | | 0.52 | — | 0.44 | — | 0.36 | — | mA |
| | 10 | | $V_O$=0.5V, $V_I$=0 or 10V | | 1.3 | — | 1.1 | — | 0.9 | — | |
| | 15 | | $V_O$=1.5V, $V_I$=0 or 15V | | 3.6 | — | 3 | — | 2.4 | — | |
| Output Current High Level | 5 | $-I_{OH}$ | $V_O$=4.6V, $V_I$=0 or 5V | | 0.52 | — | 0.44 | — | 0.36 | — | mA |
| | 10 | | $V_O$=9.5V, $V_I$=0 or 10V | | 1.3 | — | 1.1 | — | 0.9 | — | |
| | 15 | | $V_O$=13.5V, $V_I$=0 or 15V | | 3.6 | — | 3 | — | 2.4 | — | |
| Output Current High Level | 5 | $-I_{OH}$ | $V_O$=2.5V, $V_I$=0 or 5V | | 1.7 | — | 1.4 | — | 1.1 | — | mA |
| Input Leakage Current | 15 | $\pm I_I$ | $V_I$=0 or 15V | | — | 0.3 | — | 0.3 | — | 1 | μA |

## ■ Switching Characteristics (Ta=25℃, $V_{SS}$=0V, $C_L$=50pF)

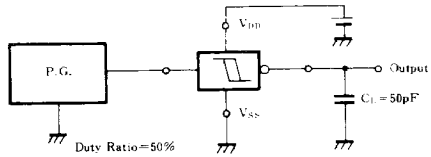
| Item | $V_{DD}$ (V) | Symbol | min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|
| Output Rise Time (Fig. 1) | 5 | $t_{TLH}$ | — | 60 | 180 | ns |
| | 10 | | — | 30 | 90 | |
| | 15 | | — | 20 | 60 | |
| Output Fall Time (Fig. 1) | 5 | $t_{THL}$ | — | 60 | 180 | ns |
| | 10 | | — | 30 | 90 | |
| | 15 | | — | 20 | 60 | |
| Propagation Delay Time (Fig. 1) | 5 | $t_{PLH}$ | — | 75 | 225 | ns |
| | 10 | | — | 35 | 105 | |
| | 15 | | — | 30 | 90 | |
| Propagation Delay Time (Fig. 1) | 5 | $t_{PHL}$ | — | 90 | 270 | ns |
| | 10 | | — | 35 | 105 | |
| | 15 | | — | 30 | 90 | |
| Threshold Voltage (Fig. 2) | 5 | $V_{IH}$ | — | 3.0 | 3.5 | V |
| | 10 | | — | 5.8 | 7 | |
| | 15 | | — | 8.3 | 11 | |

■ Switching Characteristics ($Ta = 25℃$, $V_{SS} = 0V$, $C_L = 50pF$) (continued)

| Item | $V_{DD}$ (V) | Symbol | min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|
| Threshold Voltage (Fig. 2) | 5 | $V_{TL}$ | 1.5 | 2.2 | — | V |
| | 10 | | 3 | 4.5 | — | |
| | 15 | | 4 | 6.5 | — | |
| Hysteresis Voltage (Fig. 2) | 5 | $V_H$ | 0.5 | 0.8 | — | V |
| | 10 | | 0.7 | 1.3 | — | |
| | 15 | | 0.9 | 1.8 | — | |
| Input Capacitance | | $C_I$ | — | — | 7.5 | pF |

Fig. 1 Switching Time Test Circuit and Waveforms

1. Test Circuit




2. Waveforms

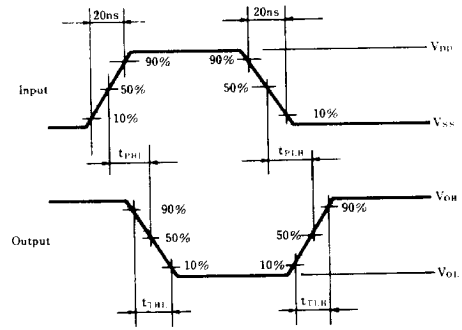
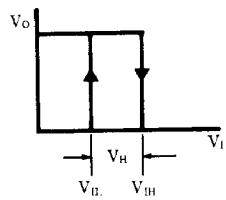
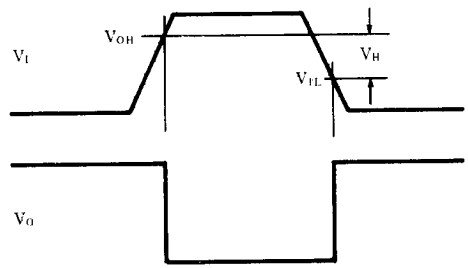



Fig. 2 Transfer Characteristics




Transfer Characteristics




The waveform illustrated above shows its definition rating 30%, to 70% limit.