

# MN4584B/MN4584BS

## Hex Schmitt Trigger

### ■ Outline

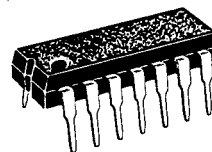
The MN4584B/S has six built-in waveform shaping circuits. It is suitable for application to which low power consumption and high noise immunity are essential, and suitable especially for application to a waveform shaping circuit using such inputs whose rise and fall are rather slow.

This hex Schmitt trigger is equivalent to Motorola's MC14584B.

### ■ Logic Diagram

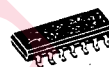


P-1



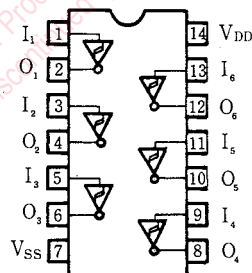
14-pin plastic DIL package

P-2



14-pin PANAFLAT package (SO-14D)

Pin Configuration



### ■ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	$V_{DD}$	$-0.5 \sim +18$	V
Input voltage	$V_I$	$-0.5 \sim V_{DD} + 0.5^*$	V
Output pin voltage	$V_O$	$-0.5 \sim V_{DD} + 0.5^*$	V
Peak input · output pin current	$\pm I_I$	max. 10	mA
Power dissipation (per package)	$P_D$	max. 400	mW
		Decrease to 200mW at the rate of 8mW/°C	
Power dissipation (per output pin)	$P_D$	max. 100	mW
Operating ambient temperature	$T_{opr}$	$-40 \sim +85$	°C
Storage temperature	$T_{stg}$	$-65 \sim +150$	°C

\*  $V_{DD} + 0.5V$  should be lower than 18V.

■ DC Characteristics ( $V_{SS}=0V$ )

Item	$V_{DD}$ (V)	Symbol	Condition	Ta = -40°C		Ta = 25°C		Ta = 85°C		Unit
				min.	max.	min.	max.	min.	max.	
Static supply current	5	$I_{DD}$	$V_I = V_{SS}$ or $V_{DD}$	—	1	—	1	—	7.5	$\mu A$
	10			—	2	—	2	—	15	
	15			—	4	—	4	—	30	
Output voltage low level	5	$V_{OL}$	$V_I = V_{SS}$ or $V_{DD}$ $ I_{OL}  < 1\mu A$	—	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_{OL}  < 1\mu A$	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_{OL}  < 1\mu A$ $V_O = 0.5V$ or $4.5V$	—	1.5	—	1.5	—	1.5	V
	10			—	3	—	3	—	3	
	15			—	4	—	4	—	4	
Input voltage high level	5	$V_{IH}$	$ I_{OL}  < 1\mu A$ $V_O = 0.5V$ or $4.5V$	3.5	—	3.5	—	3.5	—	V
	10			7	—	7	—	7	—	
	15			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			1.3	—	1.1	—	0.9	—	
	15			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			1.3	—	1.1	—	0.9	—	
	15			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	$\mu A$

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

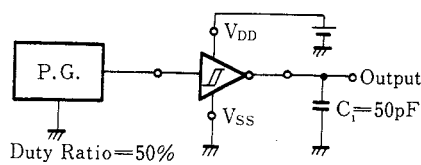
Item	$V_{DD}$ (V)	Symbol	min.	typ.	max.	Unit
Output rise time (Fig. 1)	5	$t_{TLH}$	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Output fall time	5	$t_{THL}$	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Propagation time (Fig. 1)	5	$t_{PLH}$	—	75	225	ns
	10		—	35	105	
	15		—	30	90	
Propagation time (Fig. 1)	5	$t_{PHL}$	—	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 (cont.)

Item	$V_{DD}(V)$	Symbol	min.	typ.	max.	Unit
Threshold voltage (Fig. 2)	5	$V_{IL}$	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 measuring circuit and waveforms

1. Switching time measuring circuit



2. Switching waveforms

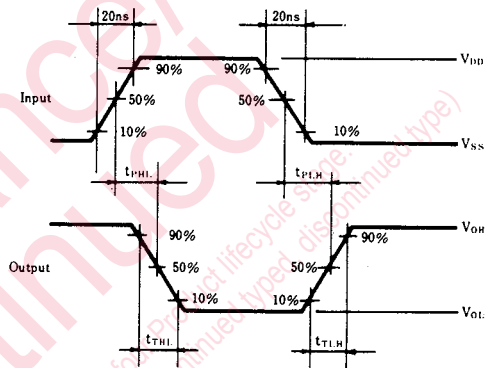
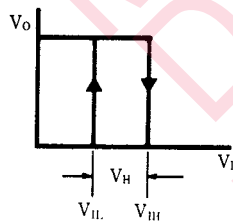
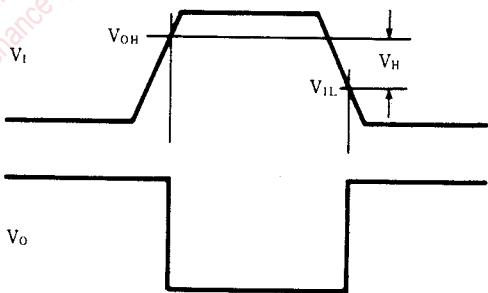


Fig. 2 Input-output characteristics



Transfer characteristics



Above waveform specifies  $V_{IH}$ ,  $V_{IL}$  and  $V_H$  and  $V_{IL}$  and  $V_{IH}$  are in the scope from 30% to 70%.

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