

# MN4085B/MN4085BS

## Dual 2-Wide 2-Input AND-OR-Invert Gate

### ■ Outline

The MN4085B/S is an output inversion type AND-OR selection gate having two built-in circuits in one chip. The circuits are constituted by two 2-input AND gates and one NOR gate, and the logic of each output is expressed as follows.

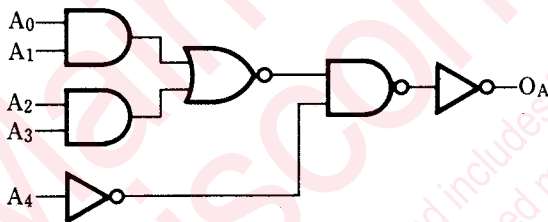
$$O_A = \overline{A_0 \cdot A_1 + A_2 \cdot A_3 + A_4}$$

$$O_B = \overline{B_0 \cdot B_1 + B_2 \cdot B_3 + B_4}$$

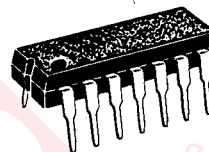
When the levels of the inhibit inputs ( $A_4$ ,  $B_4$ ) are set to "H", the select operation is inhibited and the respective output level becomes "L".

This AND-OR gate is of low power consumption with high noise immunity and is equivalent to RCA's CD4085B.

### ■ Logic Diagram

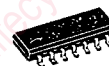


P-1



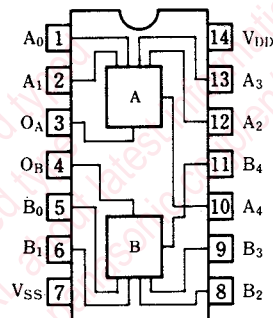
14-pin plastic DIL package

P-2



14-pin PANAFLAT package (SO-14D)

Pin Configuration



### ■ Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Rating	Unit
Supply voltage	$V_{DD}$	-0.5~+18	V
Input voltage	$V_i$	-0.5~ $V_{DD}+0.5^*$	V
Output pin voltage	$V_o$	-0.5~ $V_{DD}+0.5^*$	V
Peak input · output pin current	$\pm I_i$	max. 10	mA
Power dissipation (per package)	$T_a = -40 \sim +60^\circ\text{C}$	max. 400	mW
	$T_a = +60 \sim +80^\circ\text{C}$	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~+85	°C
Storage temperature	$T_{stg}$	-65~+150	°C

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

■ DC Characteristics (V<sub>SS</sub>=0V)

Item	V <sub>DD</sub> (V)	Symbol	Condition	Ta=-40°C		Ta=25°C		Ta=85°C		Unit		
				min.	max.	min.	max.	min.	max.			
Static supply current	5	I <sub>DD</sub>	V <sub>I</sub> =V <sub>SS</sub> or V <sub>DD</sub>	—	1	—	1	—	7.5	μA		
	10			—	2	—	2	—	15			
	15			—	4	—	4	—	30			
Output voltage low level	5	V <sub>OL</sub>	V <sub>I</sub> =V <sub>SS</sub> or V <sub>DD</sub>  I <sub>OL</sub>  <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 <sub>OH</sub>	V <sub>I</sub> =V <sub>SS</sub> or V <sub>DD</sub>  I <sub>OH</sub>  <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 <sub>IL</sub>	I <sub>OL</sub>  <1μA	V <sub>O</sub> =0.5V or 4.5V	—	1.5	—	1.5	—	V		
	10			V <sub>O</sub> =1V or 9V	—	3	—	3	—		3	
	15			V <sub>O</sub> =1.5V or 13.5V	—	4	—	4	—		4	
Input voltage high level	5	V <sub>IH</sub>	I <sub>OH</sub>  <1μA	V <sub>O</sub> =0.5V or 4.5V	3.5	—	3.5	—	3.5	V		
	10			V <sub>O</sub> =1V or 9V	7	—	7	—	7		—	7
	15			V <sub>O</sub> =1.5V or 13.5V	11	—	11	—	11		—	11
Output current low level	5	I <sub>OL</sub>	V <sub>O</sub> =0.4V, V <sub>I</sub> =0 or 5V	0.52	—	0.44	—	0.36	—	mA		
	10			V <sub>O</sub> =0.5V, V <sub>I</sub> =0 or 10V	1.3	—	1.1	—	0.9		—	
	15			V <sub>O</sub> =1.5V, V <sub>I</sub> =0 or 15V	3.6	—	3	—	2.4		—	
Output current high level	5	-I <sub>OH</sub>	V <sub>O</sub> =4.6V, V <sub>I</sub> =0 or 5V	0.52	—	0.44	—	0.36	—	mA		
	10			V <sub>O</sub> =9.5V, V <sub>I</sub> =0 or 10V	1.3	—	1.1	—	0.9		—	
	15			V <sub>O</sub> =13.5V, V <sub>I</sub> =0 or 15V	3.6	—	3	—	2.4		—	
Output current high level	5	-I <sub>OH</sub>	V <sub>O</sub> =2.5V, V <sub>I</sub> =0 or 5V	1.7	—	1.4	—	1.1	—	mA		
Input leakage current	15	±I <sub>I</sub>	V <sub>I</sub> =0 or 15V	—	0.3	—	0.3	—	1	μA		

■ Switching Characteristics (Ta=25°C, V<sub>SS</sub>=0V, C<sub>L</sub>=50pF)

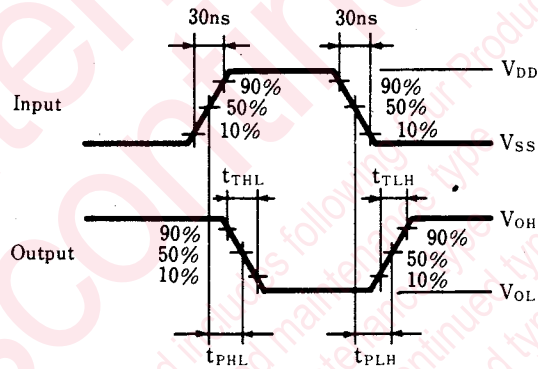
Item	V <sub>DD</sub> (V)	Symbol	min.	typ.	max.	Unit
Output rise time	5	t <sub>TLH</sub>	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Output fall time	5	t <sub>THL</sub>	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Propagation time	5	t <sub>PLH</sub>	—	65	195	ns
	10		—	30	90	
	15		—	20	60	
Propagation time	5	t <sub>PHL</sub>	—	75	225	ns
	10		—	30	90	
	15		—	20	60	
Input capacitance		C <sub>I</sub>	—	—	7.5	pF

• Switching time measuring condition and waveforms

1. Switching time measuring condition

Test No.	Input Conditions				
	A <sub>0</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
1	P.G.	H	L	L	L
2	H	P.G.	L	L	L
3	L	L	P.G.	H	L
4	L	L	H	P.G.	L
5	P.G.	P.G.	P.G.	P.G.	L
6	L	L	L	L	P.G.

2. Switching waveforms



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