

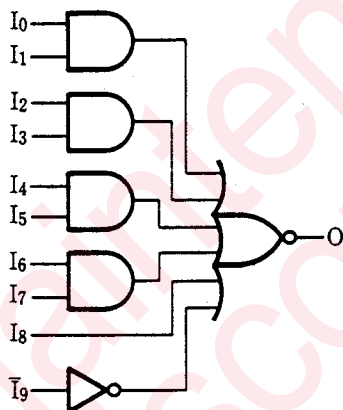
# MN4086B/MN4086BS

## Expandable 4-Wide 2-Input AND-OR-Invert Gate

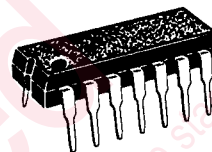
### ■ Outline

The MN4086B/S serves as an OR gate to OR four 2-input AND gates and the sum of the respective ANDs and also as an extension input AND-OR selection gate. Its output is obtained in the inverted state.

### ■ Logic Diagram

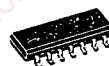


P-1



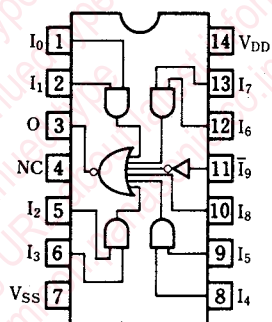
14-pin plastic DIL package

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	$T_{sig}$	$-65 \sim +150$	°C

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

■ DC Characteristics ( $V_{SS}=0V$ )

Item	$V_{DD}$ (V)	Symbol	Condition	$T_a = -40^\circ C$		$T_a = 25^\circ C$		$T_a = 85^\circ C$		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	$V_{IL}$	$V_O = 0.5V$ 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	$V_{IH}$	$V_O = 0.5V$ 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	$\mu A$

■ Switching Characteristics ( $T_a = 25^\circ C$ ,  $V_{SS} = 0V$ ,  $C_L = 50pF$ )

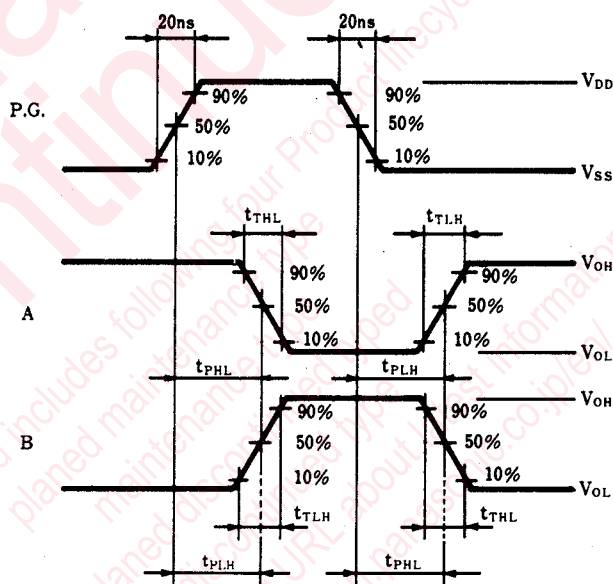
Item	$V_{DD}(V)$	Symbol	min.	typ.	max.	Unit
Output rise time	5	$t_{TLH}$	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Output fall time	5	$t_{THL}$	—	60	180	ns
	10		—	30	90	
	15		—	20	60	
Propagation time $I_0 \sim I_T \rightarrow O$ ( $H \rightarrow L$ )	5	$t_{PHL}$	—	90	270	ns
	10		—	30	90	
	15		—	20	60	
Propagation time $I_0 \sim I_T \rightarrow O$ ( $L \rightarrow H$ )	5	$t_{PLH}$	—	80	240	ns
	10		—	30	90	
	15		—	20	60	
Propagation time $I_S \rightarrow O$ ( $H \rightarrow L$ )	5	$t_{PHL}$	—	70	210	ns
	10		—	25	75	
	15		—	20	60	
Propagation time $I_S \rightarrow O$ ( $L \rightarrow H$ )	5	$t_{PLH}$	—	55	165	ns
	10		—	20	60	
	15		—	15	45	

## ■ Switching Characteristics (cont.)

Item	$V_{DD}(V)$	Symbol	min.	typ.	max.	Unit
Propagation time $\bar{I}_9 \rightarrow O$ (H $\rightarrow$ L)	5	$t_{PHL}$	—	55	165	ns
	10		—	20	60	
	15		—	15	45	
Propagation time $\bar{I}_9 \rightarrow O$ (L $\rightarrow$ H)	5	$t_{PLH}$	—	45	135	ns
	10		—	15	45	
	15		—	10	30	
Input capacitance		$C_i$	—	—	7.5	pF

## ● Switching waveforms

	Input condition						
	$I_0, I_1$	$I_2, I_3$	$I_4, I_5$	$I_6, I_7$	$I_8$	$\bar{I}_9$	
A	P.G.	L	L	L	L	H	
	L	P.G.	L	L	L	H	
	L	L	P.G.	L	L	H	
	L	L	L	P.G.	L	H	
	L	L	L	L	P.G.	H	
B	L	L	L	L	L	P.G.	



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