

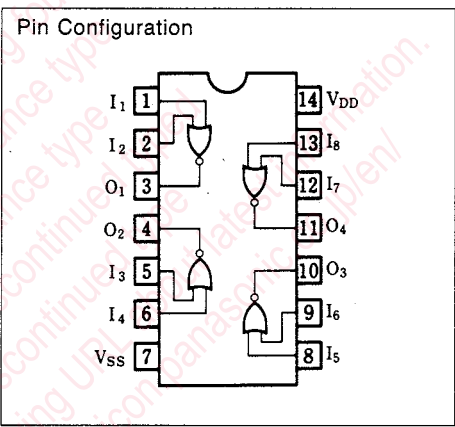
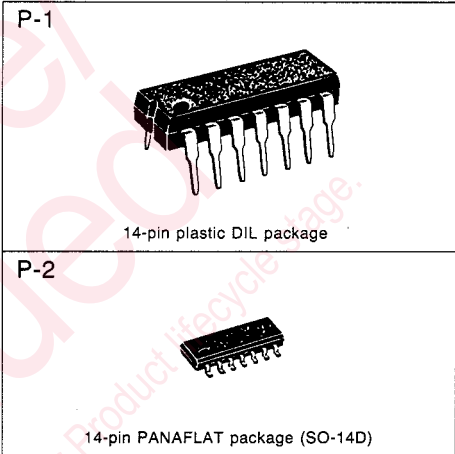
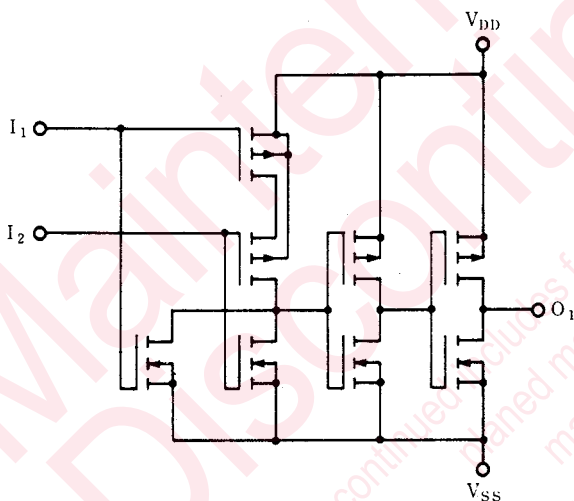
MN4001B/MN4001BS

Quad 3-Input NOR Gate

Outline

The MN4001B/S is a 2-input positive logic NOR gate having four built-in circuits in one chip. The inverter buffer added to the gate output improves the input/output transfer characteristic and minimizes the propagation delay time fluctuation caused by the load capacity increase. This NOR gate is equivalent to Motorola's MC14001B and RCA's CD4001B.

Schematic Diagram



Absolute Maximum Ratings (Ta=25°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	±I _I	max. 10	mA
Power dissipation (per package)	Ta=-40~+60°C	max. 400	mW
	Ta=+60~+80°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}+0.5V should be lower than 18V.

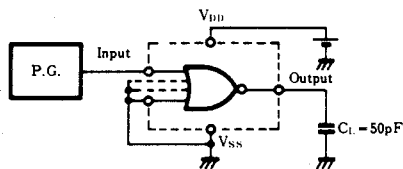
■ DC Characteristics (V_{SS}=0V)

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	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 V _O =1V or 9V V _O =1.5V or 13.5V	—	1.5	—	1.5	—	1.5	V
	10			—	3	—	3	—	3	
	15			—	4	—	4	—	4	
Input voltage high level	5	V _{IH}	I _O <1μA V _O =0.5V or 4.5V V _O =1V or 9V V _O =1.5V or 13.5V	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 V _O =0.5V, V _I =0 or 10V V _O =1.5V, V _I =0 or 15V	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 V _O =9.5V, V _I =0 or 10V V _O =13.5V, V _I =0 or 15V	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	±I _I	V _I =0 or 15V	—	0.3	—	0.3	—	1	μA

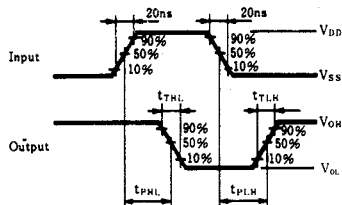
■ Switching Characteristics (Ta=25°C, V_{SS}=0V, C_L=50pF)

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	5	t _{PLH}	—	50	150	ns
	10		—	25	75	
	15		—	20	60	
Propagation time	5	t _{PHL}	—	60	180	ns
	10		—	25	75	
	15		—	20	60	
Input capacitance		C _I	—	—	7.5	pF

1. Switching Time Measuring Circuit



2. Switching Waveforms



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