MN4069UB/MN4069UBS

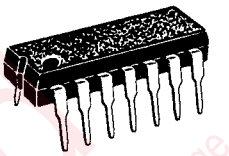
Hex Inverter

■ Outline

The MN4069UB/S is a 6-circuit inverter equipped with no buffer. Because of the singal stage gate structure, the propagation delay time is short enough.

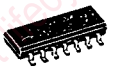
This hex inverter is equivalent to Motorola's MC14096UB and RCA's CD4069UB.

P-1



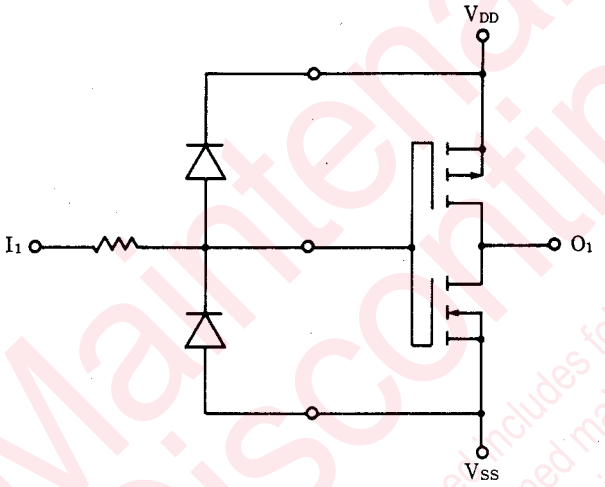
14-pin plastic DIL package

P-2

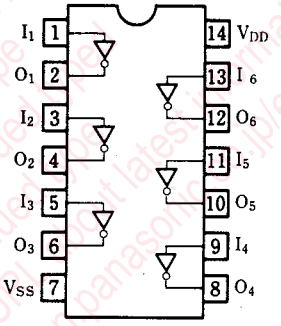


14-pin PANAFLAT package (SO-14D)

■ Schematic Diagram (1/6) & Input Protection Circuit



Pin Configuration



■ 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		$\pm I_I$	max. 10	mA
Power dissipation (per package)	Ta=−40~+60°C	P_D	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.

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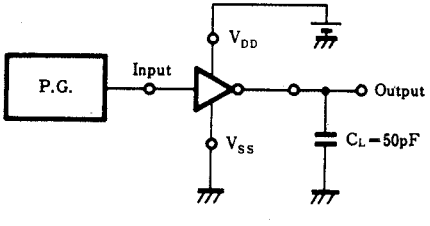
■ DC Characteristics (V_{SS}=0V)

Item	V_{DD} (V)	Symbol	Condition	Ta=−40°C min.	Ta=−40°C max.	Ta=25°C min.	Ta=25°C max.	Ta=85°C min.	Ta=85°C max.	Unit
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	—	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

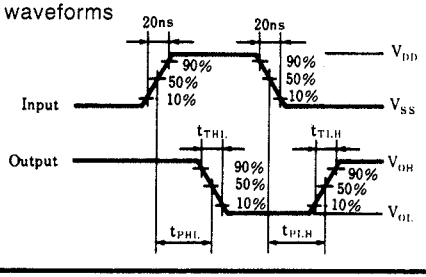
■ Switching Characteristics (Ta=25°C, V_{SS}=0V, C_L=50pF)

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}	—	40	120	ns
	10		—	20	60	
	15		—	15	45	
Propagation time	5	t_{PHL}	—	45	135	ns
	10		—	20	60	
	15		—	15	45	
Input capacitance		C_I	—	—	7.5	pF

1. Switching time measuring circuit



2. Switching waveforms



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