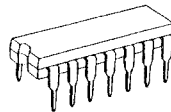


# TC4073BP/BF/BFN, TC4081BP/BF/BFN TC4082BP

**TC4073B TRIPLE 3 INPUT AND GATE**  
**TC4081B QUAD 2 INPUT AND GATE**  
**TC4082B DUAL 4 INPUT AND GATE**

TC4081BP, TC4073B and TC4082B are positive logic AND gates with two inputs, three inputs and four inputs respectively.

Since all the outputs of these gates are equipped with the buffer circuits of inverters, the input / output propagation characteristic has been improved and variation of propagation time caused by increase of load capacity is kept minimum.



P (DIP14-P-300)



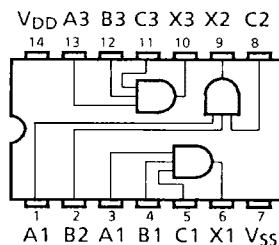
F (SOP14-P-300)



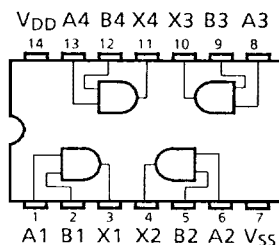
FN (SOL14-P-150)

## PIN ASSIGNMENT (TOP VIEW)

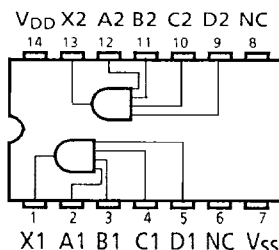
TC4073B



TC4081B



TC4082B

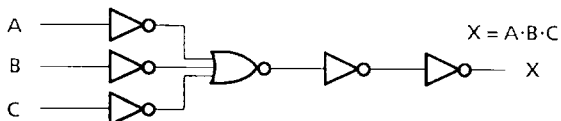


## ABSOLUTE MAXIMUM RATINGS

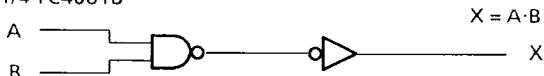
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	$V_{DD}$	$V_{SS} - 0.5 \sim V_{SS} + 20$	V
Input Voltage	$V_{IN}$	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Output Voltage	$V_{OUT}$	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
DC Input Current	$I_{IN}$	$\pm 10$	mA
Power Dissipation	$P_D$	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	$T_A$	$-40 \sim 85$	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	$-65 \sim 150$	$^{\circ}\text{C}$
Lead Temp./Time	$T_{SOL}$	$260^{\circ}\text{C} \cdot 10\text{sec}$	

## LOGIC DIAGRAM

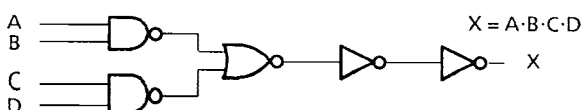
1/3 TC4073B



1/4 TC4081B



1/2 TC4082B



# TC4073BP/BF/BFN, TC4081BP/BF/BFN TC4082BP

## RECOMMENDED OPERATING CONDITIONS ( $V_{SS} = 0V$ )

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
DC Supply Voltage	$V_{DD}$	3	–	18	V
Input Voltage	$V_{IN}$	0	–	$V_{DD}$	V

## STATIC ELECTRICAL CHARACTERISTICS ( $V_{SS} = 0V$ )

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	$V_{DD}$ (V)	–40°C		25°C			85°C		UNITS	
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
High-Level Output Voltage	$V_{OH}$	$ I_{OUT}  < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	4.95	–	4.95	5.00	–	4.95	–	V	
			10	9.95	–	9.95	10.00	–	9.95	–		
			15	14.95	–	14.95	15.00	–	14.95	–		
Low-Level Output Voltage	$V_{OL}$	$ I_{OUT}  < 1\mu A$ $V_{IN} = V_{SS}, V_{DD}$	5	–	0.05	–	0.00	0.05	–	0.05	V	
			10	–	0.05	–	0.00	0.05	–	0.05		
			15	–	0.05	–	0.00	0.05	–	0.05		
Output High Current	$I_{OH}$	$V_{OH} = 4.6V$ $V_{OH} = 2.5V$ $V_{OH} = 9.5V$ $V_{OH} = 13.5V$ $V_{IN} = V_{SS}, V_{DD}$	5	–0.61	–	–0.51	–1.0	–	–0.42	–	mA	
			5	–2.5	–	–2.1	–4.0	–	–1.7	–		
			10	–1.5	–	–1.3	–2.2	–	–1.1	–		
			15	–4.0	–	–3.4	–9.0	–	–2.8	–		
Output Low Current	$I_{OL}$	$V_{OL} = 0.4V$ $V_{OL} = 0.5V$ $V_{OL} = 1.5V$ $V_{IN} = V_{SS}, V_{DD}$	5	0.61	–	0.51	1.2	–	0.42	–	mA	
			10	1.5	–	1.3	3.2	–	1.1	–		
			15	4.0	–	3.4	12.0	–	2.8	–		
Input High Voltage	$V_{IH}$	$V_{OUT} = 0.5V, 4.5V$ $V_{OUT} = 1.0V, 9.0V$ $V_{OUT} = 1.5V, 13.5V$ $ I_{OUT}  < 1\mu A$	5	3.5	–	3.5	2.75	–	3.5	–	V	
			10	7.0	–	7.0	5.5	–	7.0	–		
			15	11.0	–	11.0	8.25	–	11.0	–		
Input Low Voltage	$V_{IL}$	$V_{OUT} = 0.5V, 4.5V$ $V_{OUT} = 1.0V, 9.0V$ $V_{OUT} = 1.5V, 13.5V$ $ I_{OUT}  < 1\mu A$	5	–	1.5	–	2.25	1.5	–	1.5	V	
			10	–	3.0	–	4.5	3.0	–	3.0		
			15	–	4.0	–	6.75	4.0	–	4.0		
Input Current	"H" Level	$I_{IH}$	$V_{IH} = 18V$	18	–	0.1	–	$10^{-5}$	0.1	–	1.0	$\mu A$
	"L" Level	$I_{IL}$	$V_{IL} = 0V$	18	–	–0.1	–	$-10^{-5}$	–0.1	–	–1.0	
Quiescent Device Current	$I_{DD}$	$V_{IN} = V_{SS}, V_{DD}^*$	5	–	0.25	–	0.001	0.25	–	7.5	$\mu A$	
			10	–	0.5	–	0.001	0.5	–	15		
			15	–	1.0	–	0.002	1.0	–	30		

\* All valid input combinations.

# TC4073BP/BF/BFN, TC4081BP/BF/BFN TC4082BP

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, VSS = 0V, CL = 50pF)

CHARACTERISTICS	SYMBOL	TEST CONDITION	V <sub>DD</sub> (V)	MIN.	TYP.	MAX.	UNITS
Output Transition Time (TC4073B, TC4082B)	t <sub>TLH</sub>		5	—	80	200	ns
			10	—	50	100	
			15	—	40	80	
Output Transition Time (TC4073B, TC4082B)	t <sub>THL</sub>		5	—	80	200	
			10	—	50	100	
			15	—	40	80	
Output Transition Time (TC4081B)	t <sub>TLH</sub>		5	—	70	200	
			10	—	35	100	
			15	—	30	80	
Output Transition Time (TC4081B)	t <sub>THL</sub>		5	—	70	200	
			10	—	35	100	
			15	—	30	80	
Propagation Delay Time (TC4073B)	t <sub>pLH</sub>		5	—	115	250	
			10	—	50	120	
			15	—	35	90	
Propagation Delay Time (TC4073B)	t <sub>pHL</sub>		5	—	115	250	
			10	—	50	120	
			15	—	35	90	
Propagation Delay Time (TC4081B)	t <sub>pLH</sub>		5	—	65	200	
			10	—	30	100	
			15	—	25	80	
Propagation Delay Time (TC4081B)	t <sub>pHL</sub>		5	—	65	200	
			10	—	30	100	
			15	—	25	80	
Propagation Delay Time (TC4082B)	t <sub>pLH</sub>		5	—	110	250	
			10	—	50	120	
			15	—	35	90	
Propagation Delay Time (TC4082B)	t <sub>pHL</sub>		5	—	110	250	
			10	—	50	120	
			15	—	35	90	
Input Capacitance	C <sub>IN</sub>			—	5	7.5	pF

## CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTICS

