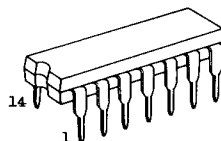


TC4001UBP QUAD 2 INPUT NOR GATE
TC4011UBP QUAD 2 INPUT NAND GATE

TC4001UBP and TC4011UBP are 2 input NOR gate and 2 input NAND gate respectively. The pin connections are same as TC4001BP and TC4011BP but the internal circuits consist of only basic NAND (NOR) circuit without the waveform shaping inverters.

Therefore, these are suitable for the applications in linear circuits such as oscillator circuits and amplifier circuits, and these have advantage in the applications of logical processing systems with faster operating speed.

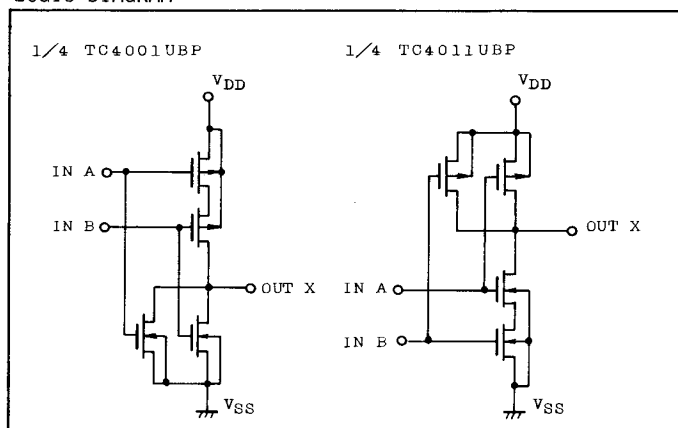


DIP14(3D14A-P)

ABSOLUTE MAXIMUM RATINGS

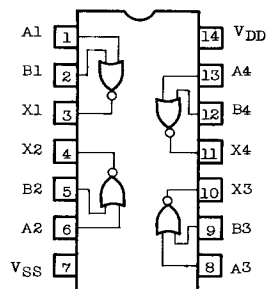
CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V _{DD}	V _{SS} - 0.5 ~ V _{SS} + 20	V
Input Voltage	V _{IN}	V _{SS} - 0.5 ~ V _{DD} + 0.5	V
Output Voltage	V _{OUT}	V _{SS} - 0.5 ~ V _{DD} + 0.5	V
DC Input Current	I _{IN}	±10	mA
Power Dissipation	P _D	300	mW
Operating Temperature Range	T _A	-40 ~ 85	°C
Storage Temperature Range	T _{stg}	-65 ~ 150	°C
Lead Temp./Time	T _{sol}	260°C • 10 sec	

LOGIC DIAGRAM

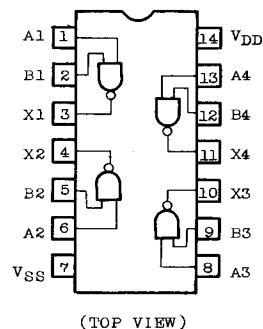


PIN ASSIGNMENT

TC4001UBP



TC4011UBP



TC4001UBP, TC4011UBP

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

CHARACTERISTIC	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)

CHARACTERISTIC		SYMBOL	TEST CONDITION	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} < 1μA 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} < 1μA 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	5	-0.61	-	-0.51	-1.0	-	-0.42	-	mA	
		V _{OH} =2.5V	5	-2.5	-	-2.1	-4.0	-	-1.7	-		
		V _{OH} =9.5V	10	-1.5	-	-1.3	-2.2	-	-1.1	-		
		V _{OH} =13.5V	15	-4.0	-	-3.4	-9.0	-	-2.8	-		
		V _{IN} =V _{SS} , V _{DD}										
Output Low Current	I _{OL}	V _{OL} =0.4V	5	0.61	-	0.51	1.2	-	0.42	-	mA	
		V _{OL} =0.5V	10	1.5	-	1.3	3.2	-	1.1	-		
		V _{OL} =1.5V	15	4.0	-	3.4	12.0	-	2.8	-		
		V _{IN} =V _{SS} , V _{DD}										
Input High Voltage	V _{IH}	V _{OUT} =0.5V, 4.5V	5	4.0	-	4.0	3.0	-	4.0	-	V	
		V _{OUT} =1.0V, 9.0V	10	8.0	-	8.0	6.5	-	8.0	-		
		V _{OUT} =1.5V, 13.5V	15	12.0	-	12.0	9.5	-	12.0	-		
		I _{OUT} < 1μA										
Input Low Voltage	V _{IL}	V _{OUT} =0.5V, 4.5V	5	-	1.5	-	2.0	1.0	-	1.0	V	
		V _{OUT} =1.0V, 9.0V	10	-	2.0	-	3.5	2.0	-	2.0		
		V _{OUT} =1.5V, 13.5V	15	-	3.0	-	5.5	3.0	-	3.0		
		I _{OUT} < 1μA										
Input Current	"H" Level	I _{IH}	V _{IH} =18V	18	-	0.1	-	10 ⁻⁵	0.1	-	1.0	μA
	"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	μA	
			10	-	0.5	-	0.001	0.5	-	15		
			15	-	1.0	-	0.002	1.0	-	30		

* All valid input combinations.

DYNAMIC ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{SS}=0\text{V}$, $C_L=50\text{pF}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	$V_{DD}(\text{V})$	MIN.	TYP.	MAX.	UNITS
Output Transition Time (TC4001UBP)	t_{TLH}		5	-	70	200	ns
			10	-	35	100	
			15	-	30	80	
Output Transition Time (TC4001UBP)	t_{THL}		5	-	70	200	
			10	-	35	100	
			15	-	30	80	
Output Transition Time (TC4011UBP)	t_{TLH}		5	-	70	200	
			10	-	35	100	
			15	-	30	80	
Output Transition Time (TC4011UBP)	t_{THL}		5	-	60	200	
			10	-	25	100	
			15	-	20	80	
Propagation Delay Time (TC4001UBP)	t_{pLH} t_{pHL}		5	-	50	120	
			10	-	25	60	
			15	-	20	50	
Propagation Delay Time (TC4011UBP)	t_{pLH} t_{pHL}		5	-	50	110	
			10	-	28	60	
			15	-	22	50	
Input Capacitance	C_{IN}			-	5	7.5	pF

CIRCUIT AND WAVEFORM FOR MEASUREMENT OF DYNAMIC CHARACTERISTIC

