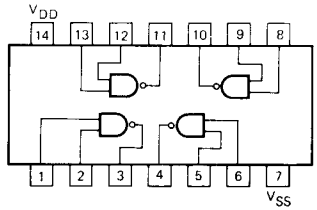
4011B • 4012B

4011B QUAD 2-INPUT NAND GATE

4012B DUAL 4-INPUT NAND GATE

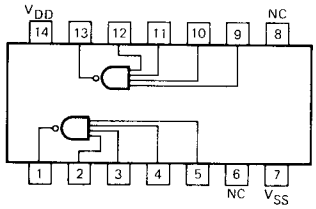
DESCRIPTION — These CMOS logic elements provide the positive input NAND function. The outputs are fully buffered for highest noise immunity and pattern insensitivity of output impedance.

4011B
LOGIC AND CONNECTION DIAGRAM
DIP (TOP VIEW)



NOTE:
The Flatpak versions have the same pinouts (Connection Diagram) as the Dual In-line Package.

4012B
LOGIC AND CONNECTION DIAGRAM
DIP (TOP VIEW)



DC CHARACTERISTICS: V_{DD} as shown, V_{SS} = 0 V (See Note 1)

SYMBOL	PARAMETER		LIMITS									UNITS	TEMP	TEST CONDITIONS
			V_{DD} = 5 V			V_{DD} = 10 V			V_{DD} = 15 V					See Note 1
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX			
I_{DD}	Quiescent Power Supply Current	XC			1			2			4	μA	MIN, 25°C	All inputs at 0 V or V_{DD}
					7.5			15			30		MAX	
		XM			0.25			0.5			1	μA	MIN, 25°C	
					7.5			15			30		MAX	

AC CHARACTERISTICS: V_{DD} as shown, V_{SS} = 0 V, T_A = 25°C, 4011B only (See Note 2)

SYMBOL	PARAMETER	LIMITS									UNITS	TEST CONDITIONS
		V_{DD} = 5 V			V_{DD} = 10 V			V_{DD} = 15V				See Note 2
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
t_{PLH}	Propagation Delay		60	110		25	60		20	48	ns	C_L = 50 pF,
t_{PHL}			60	110		25	60		20	48	ns	R_L = 200 kΩ
t_{TLH}	Output Transition Time		60	135		30	70		20	45	ns	Input Transition
t_{THL}			60	135		30	70		20	45	ns	Times ⩽ 20 ns

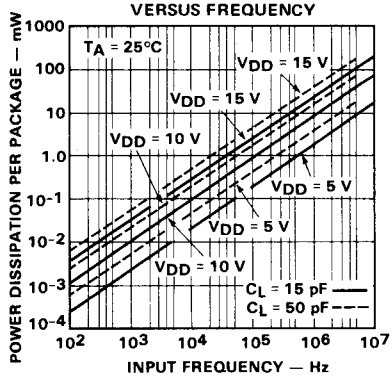
AC CHARACTERISTICS: V_{DD} as shown, V_{SS} = 0 V, T_A = 25°C, 4012B only

SYMBOL	PARAMETER	LIMITS									UNITS	TEST CONDITIONS
		V_{DD} = 5 V			V_{DD} = 10 V			V_{DD} = 15V				See Note 2
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
t_{PLH}	Propagation Delay		73	110		33	60		24	48	ns	C_L = 50 pF,
t_{PHL}			85	110		31	60		20	48	ns	R_L = 200 kΩ
t_{TLH}	Output Transition Time		76	135		37	70		27	45	ns	Input Transition
t_{THL}			67	135		25	70		17	45	ns	Times ⩽ 20 ns

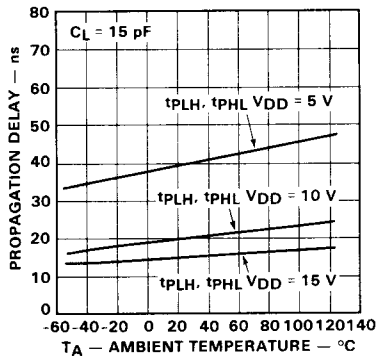
NOTES:
1. Additional DC Characteristics are listed in this section under 4000B Series CMOS Family Characteristics.
2. Propagation Delays and Output Transition Times are graphically described in this section under 4000B Series CMOS Family Characteristics.

TYPICAL ELECTRICAL CHARACTERISTICS

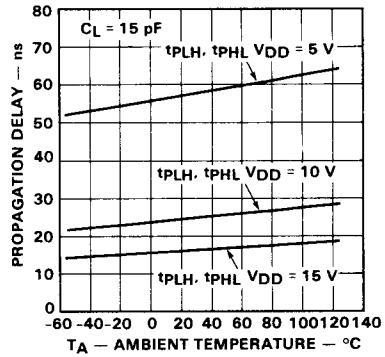
4011B AND 4012B
POWER DISSIPATION
VERSUS FREQUENCY



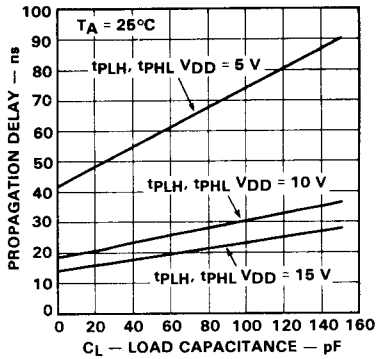
4011B
PROPAGATION DELAY
VERSUS TEMPERATURE



4012B
PROPAGATION DELAY
VERSUS TEMPERATURE



4011B
PROPAGATION DELAY
VERSUS LOAD CAPACITANCE



4012B
PROPAGATION DELAY
VERSUS LOAD CAPACITANCE