

# 4008B

## 4-BIT BINARY FULL ADDER

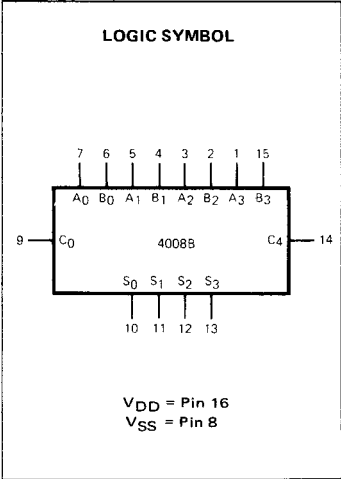
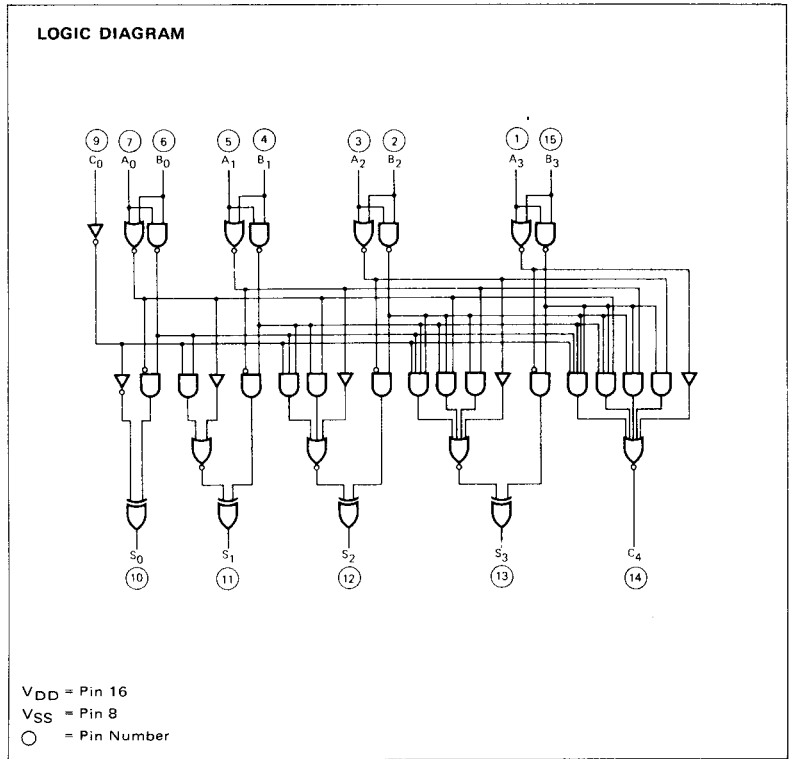
**DESCRIPTION** – The 4008B is a 4-Bit Binary Full Adder with two 4-bit Data Inputs ( $A_0$ - $A_3$ ,  $B_0$ - $B_3$ ); a Carry Input ( $C_0$ ), four Sum Outputs ( $S_0$ - $S_3$ ) and a Carry Output ( $C_4$ ).

The 4008B uses full lookahead across 4-bits to generate the Carry Output ( $C_4$ ). This minimizes the necessity for extensive "lookahead" and carry-cascading circuits.

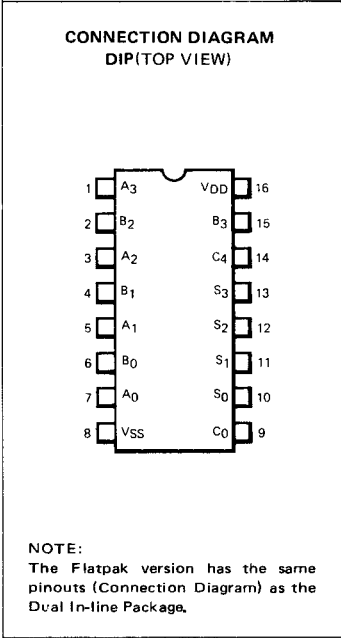
- CARRY LOOKAHEAD BUFFERED OUTPUT
- EASILY CASCADED

**PIN NAMES**

$A_0$ - $A_3$ , $B_0$ - $B_3$	Data Inputs
$C_0$	Carry Input
$S_0$ - $S_3$	Sum Outputs
$C_4$	Carry Output



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# FAIRCHILD CMOS • 4008B

**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					
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX			
$I_{DD}$	Quiescent Power Supply Current	XC			20			40			80	$\mu$ A	MIN, 25°C MAX	All inputs at 0 V or $V_{DD}$
		XM			5			10			20			
			150			300			600					

**AC CHARACTERISTICS AND SET-UP REQUIREMENTS:**  $V_{DD}$  as shown,  $V_{SS} = 0$  V,  $T_A = 25^\circ$  C (see Note 2)

SYMBOL	PARAMETER	LIMITS									UNITS	TEST CONDITIONS
		$V_{DD} = 5$ V			$V_{DD} = 10$ V			$V_{DD} = 15$ V				
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
$t_{PLH}$	Propagation Delay, $A_n, B_n$ to $S_n$		150	300		60	140		50	110	ns	$C_L = 50$ pF, $R_L = 200$ k $\Omega$ , Input Transition Times $\leq 20$ ns
$t_{PHL}$			150	300		60	140		50	110	ns	
$t_{PLH}$	Propagation Delay, $A_n, B_n$ to $C_4$		138	275		63	130		50	100	ns	
$t_{PHL}$			138	275		63	130		50	100	ns	
$t_{PLH}$	Propagation Delay, $C_0$ to $S_n$		115	250		69	115		52	90	ns	
$t_{PHL}$			123	250		69	115		52	90	ns	
$t_{PLH}$	Propagation Delay, $C_0$ to $C_4$		72	200		28	95		23	75	ns	
$t_{PHL}$			95	200		28	95		23	75	ns	
$t_{TLH}$	Output Transition Time		60	135		30	75		20	45	ns	
$t_{THL}$			60	135		30	75		20	45	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.

## APPLICATION

### A 2-DIGIT BCD TO 7-BIT BINARY DECODER USING THE 4008B

