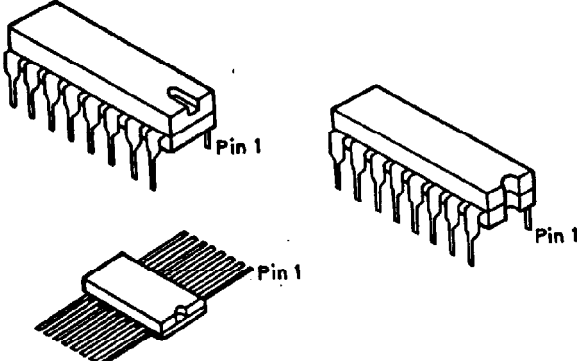


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON. W1A 2BS	BS CECC 90102 - 040 ISSUE 1 JANUARY 1982  Page 1 of 18 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	MANUFACTURERS TYPE NUMBER 54S283 64S283 74S283 84S283 SEE PD 9002 AND CECC 00 200 For ordering information see clause 1
Outline not to scale: Isometric projection Marking information see clause 1  Refer to IEC 191-1-50a (type A50C) Dual-in-Line (plastic or ceramic) refer to Appendix A1.3 Flatpack (metal or ceramic)	4-BIT BINARY FULL ADDERS WITH FAST CARRY TYPICAL CONSTRUCTION SILICON MONOLITHIC BIPOLAR CAVITY AND NON-CAVITY PACKAGES ASSESSMENT LEVELS R, S, T, AND V

1. Type description

1.1 Truth table (see page 2)

Refer to Qualified Products List PD 9002 and/or CECC 00 200
for details of manufacturers approved to this specification

1.1 Truth table (contd)

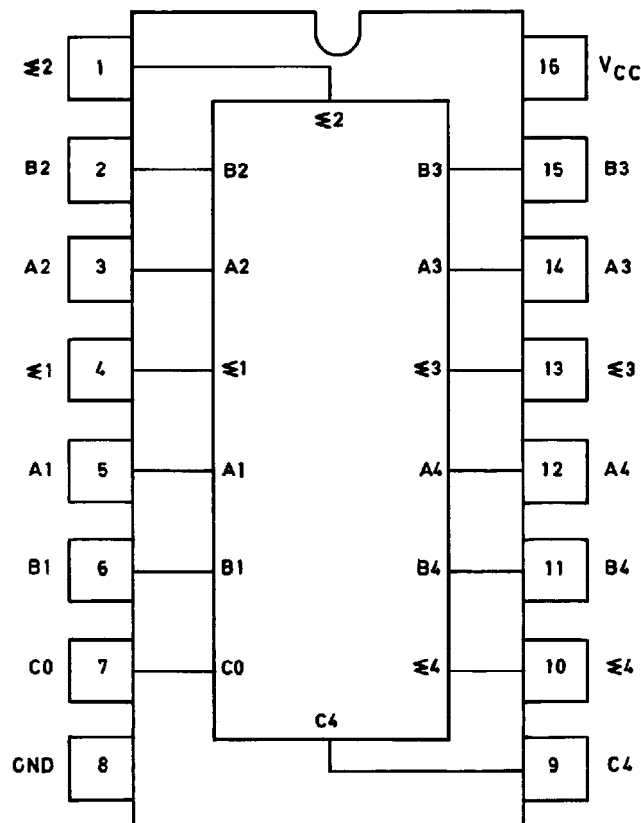
INPUT				OUTPUT					
				When CO-L			When CO-H		
A1 A3	B1 B3	A2 A4	B2 B4	$\Sigma 1$ $\Sigma 3$	$\Sigma 2$ $\Sigma 4$	C2 C4	$\Sigma 1$ $\Sigma 3$	$\Sigma 2$ $\Sigma 4$	C2 C4
L	L	L	L	L	L	L	H	L	L
H	L	L	L	H	L	L	L	H	L
L	H	L	L	H	L	L	L	H	L
H	H	L	L	L	H	L	H	H	L
L	L	H	L	L	H	L	H	H	L
H	L	H	L	H	H	L	L	L	H
L	H	H	L	H	H	L	L	L	H
H	H	H	L	L	L	H	H	L	H
L	L	L	H	L	H	L	L	L	H
H	L	L	H	H	H	L	L	L	H
L	H	L	H	H	H	L	L	L	H
H	H	L	H	L	L	H	H	L	H
L	L	H	H	L	L	H	H	L	H
H	L	H	H	H	L	H	L	H	H
L	H	H	H	H	L	H	L	H	H
H	H	H	H	L	H	H	H	H	H

H = High level
L = Low level

NOTE Input conditions at A1, B1, A2, B2 and CO are used to determine outputs $\Sigma 1$ and $\Sigma 2$ and the value of the internal carry C2. The values at C2, A3, B3, A4 and B4 are then used to determine outputs $\Sigma 3$, $\Sigma 4$, and C4.

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



4-bit binary full adders with fast carry

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74S283J	N	W
-25 + 85	84S283J		
-40 + 85	64S283J		
-55 +125	54S283J		



1.2.3 Marking

Each integrated circuit shall bear the following markings:

- (1) Terminal identification
- (2) Type designation
- (3) Date code
- (4) Factory identification code (unless derived from trademark)
- (5) Manufacturers trade name or mark
- (6) Mark of conformity (unless a certificate of conformity is used)

1.3 Ordering information

Orders for these integrated circuits shall contain the following minimum information:

Manufacturers integrated circuit type designation, screening procedures and assessment levels as detailed to this CECC specification number.

(For details of screening procedures see Appendix A1.1)

2. Limiting conditions of use (not for inspection purposes)

2.1	Minimum and maximum continuous supply voltages	V_{CC}						-0,5V +7,0V
2.2	Minimum and maximum input voltages							
2.2.1	Minimum and maximum input voltage	V_I						-0,5V +5,5V
2.2.2	Maximum input voltage between multiple emitter transistor inputs	V_{II}						+5,5V
				54S	64S	74S	84S	
2.3	Minimum and maximum operating ambient temperatures	$T_{amb}(^{\circ}C)$	min.	-55	-40	0	-25	
			max.	+125	+85	+70	+85	
2.4	Minimum and maximum storage temperatures	$T_{stg}(^{\circ}C)$	min.	-65	(All types)			
			max.	+150				

3. Recommended operating conditions and associated characteristics (not for inspection purposes)

3.1 Recommended operating conditions.

These apply over the operating ambient temperature range unless otherwise stated.



3.1 (contd)

Description	Symbol	Type	Value	Unit
Positive supply voltage range	V_{CC}	54S 64/74/84S	4,5 - 5,5 4,75 - 5,25	V V
Minimum value of High level input voltage	V_{IHB}	All types	2,0	V
Maximum value of High level input voltage	V_{IHA}	All types	5,5	V
Minimum value of Low level input voltage	V_{ILB}	All types	-0,3	V
Maximum value of Low level input voltage	V_{ILA}	All types	0,8	V
Maximum value of Low level output current C4 output Other outputs	I_{OLA} I_{OLA}	All types All types	10,0 20,0	mA mA
Maximum value of High level output current C4 output Other outputs	$-I_{OHA}$ $-I_{OHA}$	All types All types	500,0 1,0	μ A mA
D.C. noise margin at Low level ($V_{ILA} - V_{OLA}$) at High level ($V_{OHB} - V_{IHB}$)	V_{NL} V_{NH} V_{NH}	All types 54S 64/74/84S	0,3 0,5 0,7	V V V

3.2 Associated characteristics

3.2.1 Minimum and maximum values are given for the worst case operation over the ambient temperature range, except for those conditions marked with an asterisk (*)

	54S	64S	74S	84S	
T _{amb} min.	-55	-40	0	-25	°C
T _{amb} max.	+125	+85	+70	+85	
V _{CC} min.	4,5	4,75			V
V _{CC} max.	5,5	5,25			



Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Total supply current per package	All inputs at 4,5V All outputs open	V_{CC} max.	I_{CC}	-	160,0	mA
High level input current	$V_{IH(1)} = 5,5V$ $V_{IH(2)} = 2,7V$	V_{CC} max.	$I_{IH(1)}$	-	1,0	mA
		V_{CC} max.	$I_{IH(2)}$	-	50,0	μA
Low level input current	$V_{IN} = 0,5V$	V_{CC} max.	$-I_{IL}$	-	2,0	mA
Input clamping voltage	$-I_{IC} = 18,0mA$	V_{CC} min.	$-V_{IC}$	-	1,2	V
Output voltage 54S 64/74/84S All types	$V_{IN} = 0,8V$ and/ or 2,0V $-I_{OH} = I_{OHA}$ $I_{OL} = I_{OLA}^* (1)$	V_{CC} min.	V_{OH}	2,5	-	V
			V_{OH}	2,7	-	V
			V_{OL}	-	0,5	V
Output short circuit current	V_{IN} to give High level output $V_O = 0V (2)$ applicable to only one output at a time C4 output Other outputs	V_{CC} max.				
			$-I_{OS}$ $-I_{OS}$	20,0 40,0	100,0 100,0	mA mA
Propagation times All types	$T_{amb} = 25^\circ C^*$ test conditions as in Sub-group A5	5,0V				
High to Low level						
From	To					
CO	Any Σ	$R_L = 280\Omega$	t_{PHL}	-	18,0	ns
Ai or Bi	Σ	$R_L = 280\Omega$	t_{PHL}	-	18,0	ns
CO	C4	$R_L = 560\Omega$	t_{PHL}	-	11,0	ns
Ai or Bi	C4	$R_L = 560\Omega$	t_{PHL}	-	12,0	ns
Low to High level						
From	To					
CO	Any Σ	$R_L = 280\Omega$	t_{PLH}	-	18,0	ns
Ai or Bi	Σi	$R_L = 280\Omega$	t_{PLH}	-	18,0	ns
CO	C4	$R_L = 560\Omega$	t_{PLH}	-	11,0	ns
Ai or Bi	C4	$R_L = 560\Omega$	t_{PLH}	-	12,0	ns

(1) Fan out = 10

(2) Only one output at a time, duration $t \leq 1$ sec

*See Clauses 3.1 and 3.2.1 of this specification