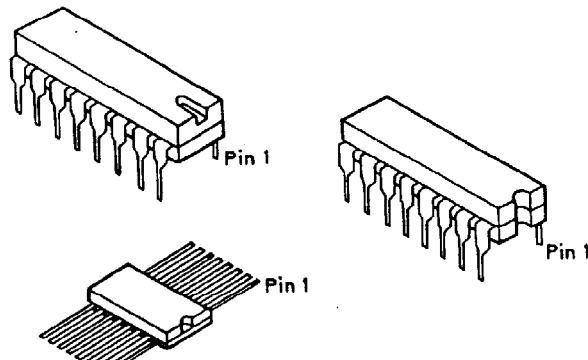


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON. W1A 2BS	BS CECC 90103 - 038 ISSUE 1 NOVEMBER 1981 Page 1 of 19 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	MANUFACTURERS TYPE NUMBER 54LS83A 64LS83A 74LS83A 84LS83A 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 TTL-LOW-POWER SCHOTTKY 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

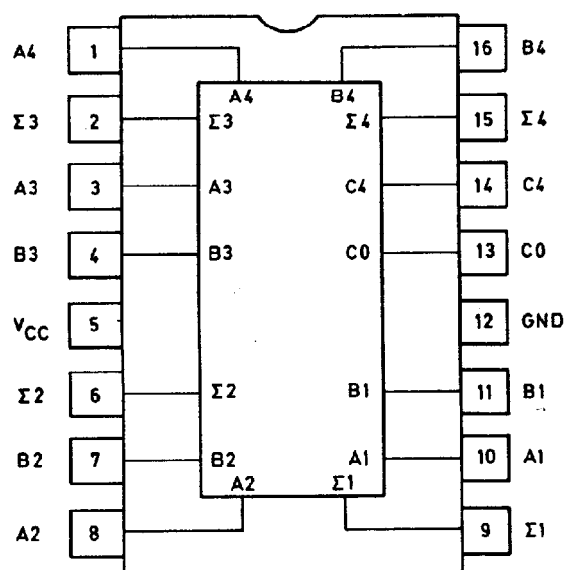
INPUT				WHEN CO = L			WHEN CO = H		
A1 A3	B1 B3	A2 A4	B2 B4	$\Sigma 1$ $\Sigma 3$	$\Sigma 2$ $\Sigma 4$	C2 C4	$\Sigma 1$ $\Sigma 3$	$\Sigma 2$ $\Sigma 4$	C2 C4
L	L	L	L	L	L	L	H	L	L
H	L	L	L	H	L	L	L	H	L
L	H	L	L	L	L	L	L	H	L
H	H	L	L	L	H	L	H	H	L
L	L	H	L	L	H	L	H	L	L
H	L	H	L	L	H	L	L	L	H
L	H	H	L	L	H	L	L	L	H
H	H	H	L	L	L	H	H	L	H
L	L	L	H	L	H	L	H	H	L
H	L	L	H	L	H	L	L	L	H
L	H	L	H	L	H	L	L	L	H
H	H	L	H	L	H	L	L	L	H
L	L	H	H	L	L	H	H	L	H
H	L	H	H	L	L	H	L	H	H
L	H	H	H	L	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	74LS83AJ	N	W
-25 + 85	84LS83AJ		
-40 + 85	64LS83AJ		
-55 +125	54LS83AJ		

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

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}	54LS 64/74/84LS	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}	54LS 64/74/84LS	0,7 0,8	V V
Maximum value of Low level output current for each output	I_{OLA}	54LS 64/74/84LS	4,0 8,0	mA mA
Maximum value of output current for each output at V_{OH}	I_{OHA}	All types	-400,0	μ A

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 (*)

	54LS	64LS	74LS	84LS	
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			

3.2.2

Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Total supply current per package	All inputs grounded All B Low, other input at 4,5V All inputs at 4,5V	V_{CC} max.	I_{CC} I_{CC} I_{CC}	- - -	39,0 34,0 34,0	mA mA mA
High level input current Any A or B CO Any A or B CO	$V_{IH(1)} = 7,0V$ $V_{IH(2)} = 2,7V$	V_{CC} max.	$I_{IH(1)}$ $I_{IH(2)}$	- - - -	0,2 0,1 40,0 20,0	mA mA μA μA
Low level input current Any A or B CO	$V_{IL} = 0,4V$	V_{CC} max.	$-I_{IL}$ $-I_{IL}$	- -	0,8 0,4	mA mA
Input clamping voltage	$-I_{IC} = 18,0mA$	V_{CC} min.	$-V_{ICA}$	-	1,5	V
Output voltage 54LS 64/74/84LS All types 64/74/84LS	$I_{OH} = -400,0\mu A$ $I_{OH} = -400,0\mu A$ $I_{OL(1)} = 4,0mA$ (1) $I_{OL(2)} = 8,0mA$ (2)	V_{CC} min.	V_{OH} V_{OH} $V_{OL(1)}$ $V_{OL(2)}$	2,5 2,7 - -	- - 0,4 0,5	V V V V
Output short circuit current	$V_O = 0V$ (3) $V_{IL} = 0V$	V_{CC} max.	$-I_{OS}$	15,0	130,0	mA
Propagation times All types	$T_{amb} = 25^{\circ}C$ * test conditions as in Sub-group A5	$V_{CC} = 5,0V$				
From CO A_1 or B_1 CO A_1 or B_1	To Any Σ Σ_1 C4 C4		t_{PHL}	- - - -	24,0 24,0 22,0 17,0	ns ns ns ns

(1) Fan out = 10, (2) Fan out = 20,

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

* See 3.2.1 of this specification