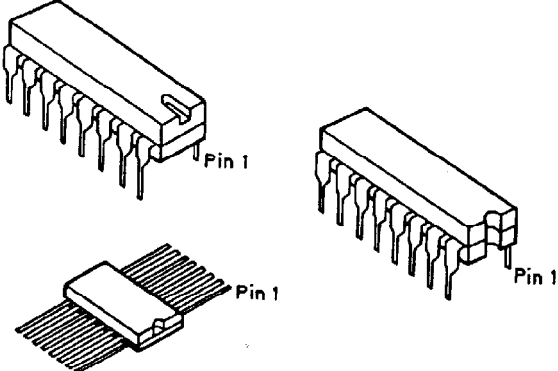


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON. W1A 2BS	BS CECC 90103 - 134 ISSUE 1 NOVEMBER 1981  Page 1 of 19 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	MANUFACTURERS TYPE NUMBER 54LS48 64LS48 74LS48 84LS48 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)	BCD-TO-SEVEN SEGMENT DECODER DRIVERS 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 (contd)

DECIMAL OR FUNCTION	INPUTS						BI/RBO†	OUTPUTS							NOTE
	LT	RBI	D	C	B	A		a	b	c	d	e	f	g	
0	H	H	L	L	L	L	H	H	H	H	H	H	H	L	1
1	H	X	L	L	L	H	H	L	H	H	L	L	L	L	
2	H	X	L	L	H	L	H	H	H	L	H	H	L	H	
3	H	X	L	L	H	H	H	H	H	H	H	L	L	H	
4	H	X	L	H	L	L	H	L	H	H	L	L	H	H	
5	H	X	L	H	L	H	H	H	L	H	H	L	H	H	
6	H	X	L	H	H	L	H	L	L	H	H	H	H	H	
7	H	X	L	H	H	H	H	H	H	H	L	L	L	L	
8	H	X	H	L	L	L	H	H	H	H	H	H	H	H	
9	H	X	H	L	L	H	H	H	H	H	L	L	H	H	
10	H	X	H	L	H	L	H	L	L	L	H	H	L	H	
11	H	X	H	L	H	H	H	L	L	H	H	L	L	H	
12	H	X	H	H	L	L	H	L	H	L	L	L	H	H	
13	H	X	H	H	L	H	H	H	L	L	H	L	H	H	
14	H	X	H	H	H	L	H	L	L	L	H	H	H	H	
15	H	X	H	H	H	H	H	L	L	L	L	L	L	L	
BI	X	X	X	X	X	X	L	L	L	L	L	L	L	L	2
RBI	H	L	L	L	L	L	L	L	L	L	L	L	L	L	3
LT	L	X	X	X	X	X	H	H	H	H	H	H	H	H	4

H = High level

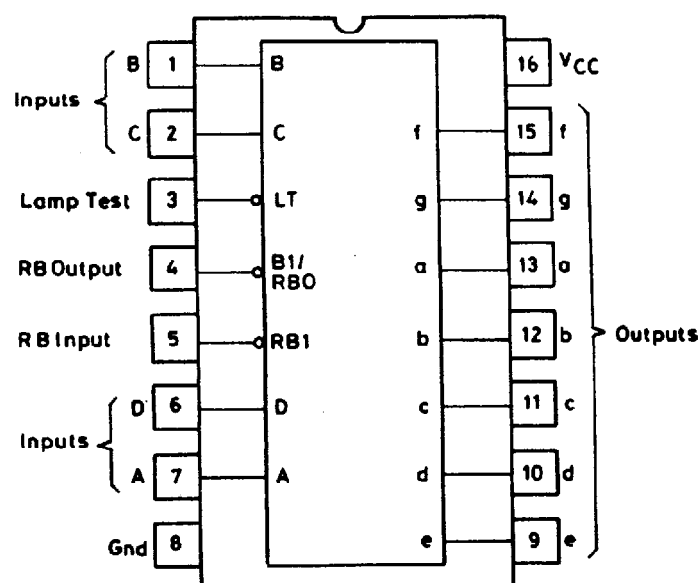
L = Low level

X = Logic level irrelevant

- NOTES: 1. The blanking input (BI) must be open or held at a High logic level when output functions 0 through 15 are desired. Ripple-blanking input (RBI) must be open or High if blanking of a decimal zero is not desired.
2. When a Low logic level is applied directly to the blanking input (BI) all segment outputs are Low regardless of the level of the other input.
3. When ripple-blanking input (RBI) and inputs A, B, C and D are at a Low level with the lamp test input high, all segment outputs go Low and the ripple-blanking output (RBO) goes to a Low level (response condition).
4. When the blanking input/ripple-blanking output (BI/RBO) is open or held High and a Low is applied to the lamp-test input all segment outputs are High.
- † BI/RBO is wire-AND logic serving as blanking input (BI) and/or ripple-blanking output (RBO).

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



BCD-to-seven segment decoder drivers

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74LS48J	N	W
-25 + 85	84LS48J		
-40 + 85	64LS48J		
-55 +125	54LS48J		

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	-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.

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
Maximum value of Low level input voltage	V_{ILA}	54LS 64/74/84LS	0,7 0,8	V V

3.1 (contd)

Description	Symbol	Type	Value	Unit
Maximum value of Low level current for each output At a through g At BI/RBO	I_{OLA}	54LS 64/74/84LS 54LS 64/74/84LS	2,0 6,0 1,6 3,2	mA mA mA mA
Minimum output current at a through g	$-I_O$	All types	1,3	mA
Minimum output voltage	V_O	All types	0,85	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 (*)

	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	$V_{IL} = 0V$ (1) All inputs at 4,5V All outputs open circuit	V_{CC} max.	I_{CC}	-	38,0	mA
High level input current	$V_{IH(1)} = 7,0V$ except BI/RBO	V_{CC} max.	$I_{IH(1)}$	-	100,0	μA
	$V_{IH(2)} = 2,7V$ except BI/RBO	V_{CC} max.	$I_{IH(2)}$	-	20,0	μA

(1) To all inputs

3.2.2 (contd)

Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Low level input current At BI/RBO At other inputs	$V_{IN} = V_{OLA}$	$V_{CC} \text{ max.}$	$-I_{IL}$	-	1,2	mA
			$-I_{IL}$	-	0,4	mA
Input clamping voltage	$-I_{IC} = 18,0\text{mA}$	$V_{CC} \text{ min.}$	$-V_{ICA}$	-	1,5	V
Output voltage All types At a through g 54LS 64/74/84LS At BI/RBO 54LS 64/74/84LS	$I_{OUT} = I_{OHA}$	$V_{CC} \text{ min.}$	V_{OH}	2,4	-	V
	$I_{OL} = 2,0\text{mA}$		V_{OL}	-	0,4	V
	$I_{OL} = 6,0\text{mA}$		V_{OL}	-	0,5	V
	$I_{OL} = 1,6\text{mA}$ (2)		V_{OL}	-	0,4	V
	$I_{OL} = 3,2\text{mA}$ (3)		V_{OL}	-	0,5	V
Output short circuit current at BI/RB1 only	$V_O = 0V$ (4)	$V_{CC} \text{ max.}$	$-I_{OS}$	0,3	2,0	mA
Propagation times All types	$T_{amb} = 25^{\circ}C^*$ test conditions as in Sub-group A5	5,0V	t_{PLH}	-	100,0	ns
			t_{PHL}	-	100,0	ns

(2) Fan out = 10, (3) Fan out = 20,

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

*See 3.2.1 of this specification

3.3 Supplementary information