



BRITISH STANDARDS INSTITUTION

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BS CECC 90103 - 029

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Page 1 of 17 pages

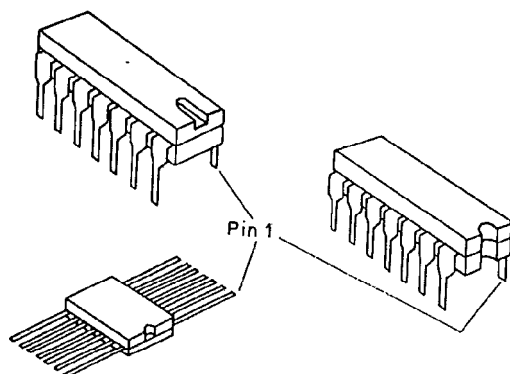
ELECTRONIC COMPONENTS OF ASSESSED QUALITY
DETAIL SPECIFICATION IN ACCORDANCE WITH:

BS CECC 90 000 : 1976
BS CECC 90 100 : 1977

MANUFACTURERS TYPE NUMBER

54LS49
64LS49
74LS49
84LS49

Outline not to scale: Isometric projection
Marking information see clause 1



SEE PD 9002 AND CECC 00 200
For ordering information see
clause 1

BCD/7 SEGMENT TO 7 SEGMENT
DECODER/DRIVER WITH OPEN
COLLECTOR OUTPUTS

TYPICAL CONSTRUCTION
SILICON MONOLITHIC
BIPOLAR TTL-LOW-POWER
SCHOTTKY

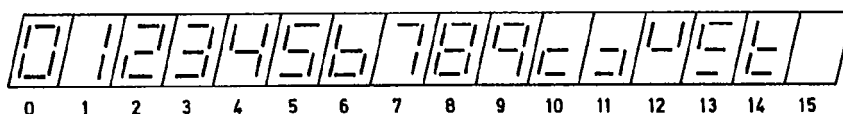
ASSESSMENT LEVELS
R, S, T AND V

Refer to IEC 191-1-50a (type A50B)
Dual-in-Line (plastic or ceramic)
refer to Appendix A1.3
Flatpack (metal or ceramic)

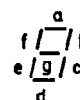
1. Type description

1.1 Truth table (see page 2)

NUMERICAL DESIGNATIONS AND RESULTANT DISPLAYS



SEGMENT
IDENTIFICATION



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					OUTPUTS							NOTE
	D	C	B	A	B1	a	b	c	d	e	f	g	
0	L	L	L	L	H	H	H	H	H	H	H	L	(1)
1	L	L	L	H	H	L	H	H	L	L	L	L	
2	L	L	H	L	H	H	H	L	H	H	L	H	
3	L	L	H	H	H	H	H	H	H	L	L	H	
4	L	H	L	L	H	L	H	H	L	L	H	H	
5	L	H	L	H	H	H	L	H	H	L	H	H	
6	L	H	H	L	H	L	L	H	H	H	H	H	
7	L	H	H	H	H	H	H	H	L	L	L	L	
8	H	L	L	L	H	H	H	H	H	H	H	H	
9	H	L	L	H	H	H	H	H	L	L	H	H	
10	H	L	H	L	H	L	L	L	H	H	L	H	
11	H	L	H	H	H	L	L	H	H	L	L	H	
12	H	H	L	L	H	L	H	L	L	L	H	H	
13	H	H	L	H	H	H	L	L	H	L	H	H	
14	H	H	H	L	H	L	L	L	H	H	H	H	
15	H	H	H	H	H	L	L	L	L	L	L	L	
B1	X	X	X	X	L	L	L	L	L	L	L	L	(2)

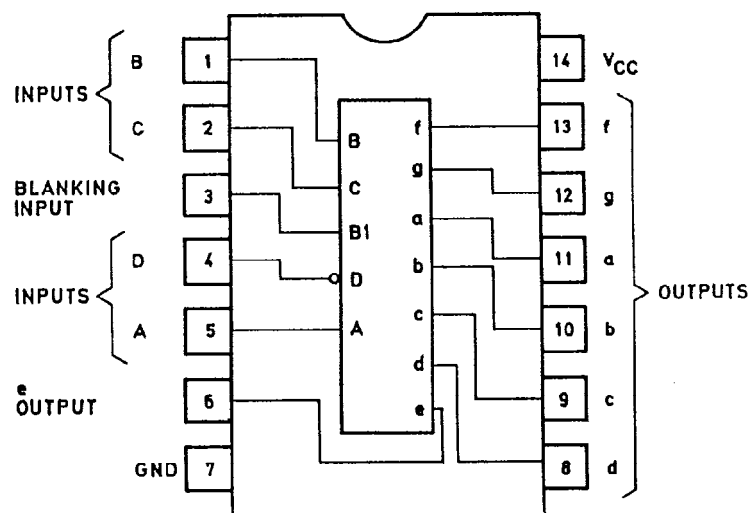
H = High level
L = Low level
X = Logic level irrelevant

NOTE: The blanking input (B1) must be open or held at a High logic level when output functions 0 through 15 are desired.

When a Low logic level is applied directly to the blanking input (B1), all segment outputs are Low regardless of the state of any other input.

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



BCD/7 segment to 7 segment
decoder/driver with open collector outputs

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74LS49J	N	W
-25 + 85	84LS49J		
-40 + 85	64LS49J		
-55 ÷125	54LS49J		

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 procedure and assessment levels as detailed to this CECC specification number.

(For details of screening procedures see Appendix A1).

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 voltage	V_I						-0,5V +7,0V
				54LS	64LS	74LS	84LS	
2.3	Minimum and maximum operating ambient temperatures	$T_{amb}(^{\circ}C)$	min. max.	-55 +125	-40 +85	0 +70	-25 +85	
2.4	Minimum and maximum storage temperatures	$T_{stg}(^{\circ}C)$	min. max.	-65 +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.

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 High level output current (leakage)	$-I_{OHX}$	All types	250,0	μA
Maximum value of applied off-state output voltage	V_{OZA}	All types	5,5	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

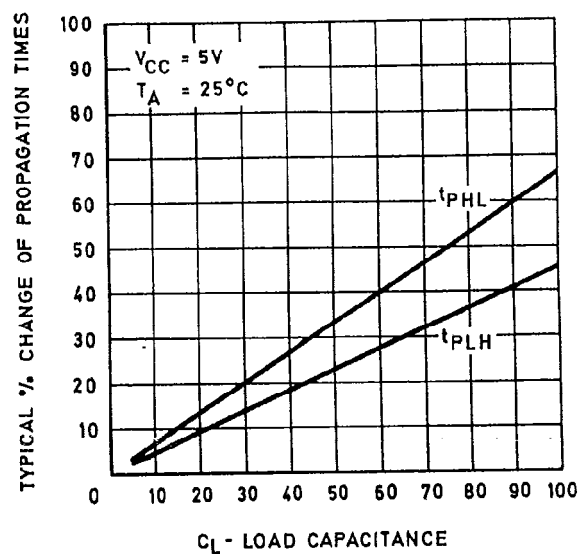
Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Total supply current per package	$V_{IN} = 3,0V \text{ (1)}$	$V_{CC} \text{ max.}$	I_{CC}	-	15,0	mA
High level input current	$V_{IH(1)} = 7,0V$	$V_{CC} \text{ max.}$	$I_{IH(1)}$	-	100,0	μA
	$V_{IH(2)} = 2,7V$	$V_{CC} \text{ max.}$	$I_{IH(2)}$	-	20,0	μA
Low level input current	$V_{IL} = 0,4V$	$V_{CC} \text{ max.}$	$-I_{IL}$	-	0,4	mA
Input clamping voltage	$-I_{IC} = 18,0mA$	$V_{CC} \text{ min.}$	$-V_{ICA}$	-	1,5	V
Output voltage All types 64/74/84LS	$I_{OL(1)} = 4,0mA \text{ (2)}$	$V_{CC} \text{ min.}$	$V_{OL(1)}$	-	0,4	V
	$I_{OL(2)} = 8,0mA \text{ (3)}$		$V_{OL(2)}$	-	0,5	V
Propagation times All types from A input from B1 input	$T_{amb} = 25^{\circ}\text{C}^*$ $C_L = 15pF$ $R_L = 2K\Omega$ $C_L = 15pF$ $R_L = 6K\Omega$	$V_{CC} = 5,0V$	t_{PLH}	-	100,0	ns
			t_{PHL}	-	100,0	ns
			t_{PLH}	-	100,0	ns
			t_{PHL}	-	100,0	ns

(1) To all inputs, (2) Fan out = 10, (3) Fan out = 20,

* See 3.2.1 of this specification.

3.3 Supplementary information

3.3.1 Change of typical propagation time with output loading



Propagation time Vs. load capacitance

3.3.2 Variation of propagation time with temperature

