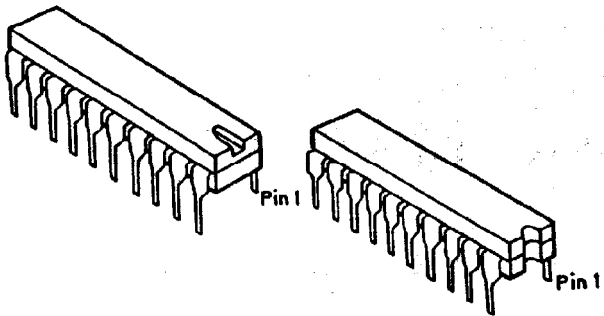


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON. W1A 2BS	BS CECC 90103 - 091 ISSUE 1 NOVEMBER 1981 Page 1 of 20 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	MANUFACTURERS TYPE NUMBER 54LS244 64LS244 74LS244 84LS244 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 Appendix A1.3 Dual-in-Line (ceramic)	OCTAL BUFFERS/LINE DRIVERS NON-INVERTED 3-LEVEL OUTPUTS 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

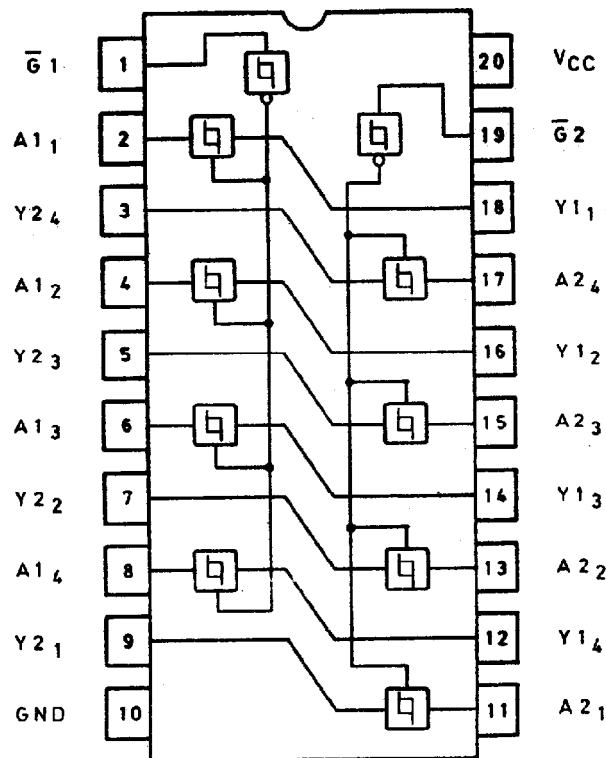
1.1 Truth table (contd)

INPUTS		OUTPUT
ENABLE $\bar{G}$	A	Y
H	X	Z
L	L	L
L	H	H

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

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



Octal buffers/line drivers
 non-inverted 3-level outputs

1.2.1 (contd)

Three level device

A device whose output can be driven into a High, Low or high-impedance level.

High-impedance level

That level of a device in which the output acquires a high-impedance characteristic.

High-impedance leakage current

The current measured at the output terminal with input conditions applied such as to cause the switching element to be in the high-impedance level.

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74LS244J	N	W
-25 + 85	84LS244J		
-40 + 85	64LS244J		
-55 +125	54LS244J		

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}
 $+5,5V$

2.3 Minimum and maximum operating ambient temperatures

 $T_{amb}(^{\circ}C)$

min.
max.

54LS 64LS 74LS 84LS

-55 -40 0 -25
+125 +85 +70 +85

2.4 Minimum and maximum storage temperatures

 $T_{stg}(^{\circ}C)$

min.
max.

-65 (All types)
+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
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	12,0 24,0	mA mA
Maximum value of output current for each output at V_{OH}	$-I_{OHA}$	54LS 64/74/84LS	12,0 15,0	mA mA
High impedance level output (leakage) current	$-I_{OHZ}$	All types	20,0	μA
	$-I_{OLZ}$	All types	20,0	μA
D.C. noise margin at Low level ($V_{ILA} - V_{OLA}$) at High level ($V_{OHB} - V_{IHB}$)	V_{NL}	All types	0,3	V
	V_{NH}	54LS	0,5	V
		64/74/84LS	0,7	V
Hysteresis (at $V_{T+} - V_{T-}$)	V_{HSTB}	All types	0,2	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	$V_{CC}(\text{V})$	Symbol	Min.	Max.	Unit
Total supply current per package	Outputs High	V_{CC} max.	I_{CCH}	-	27,0	mA
	Outputs Low		I_{CCL}	-	46,0	mA
	Outputs Disabled		I_{CCZ}	-	54,0	mA
High level input current	$V_{IH(1)} = 7,0\text{V}$	V_{CC} max.	$I_{IH(1)}$	-	0,1	mA
	$V_{IH(2)} = 2,7\text{V}$	V_{CC} max.	$I_{IH(2)}$	-	20,0	μA
Low level input current	$V_{IN} = 0,4\text{V}$	V_{CC} max.	$-I_{IL}$	-	0,2	mA
Input clamping voltage	$-I_{IC} = 18,0\text{mA}$	V_{CC} min.	$-V_{ICA}$	-	1,5	V
Output voltage	$V_{IN} = V_{ILA}^*$ or 2,0V as appropriate	V_{CC} min.				
	$-I_{OH} = 3,0\text{mA}$		V_{OH}	2,4	-	V
	$I_{OH} = -I_{OHA}^*$		V_{OH}	2,0	-	V
	All types $I_{OL} = 12,0\text{mA}$ (1)		V_{OL}	-	0,4	V
	64/74/84LS $I_{OL} = 24,0\text{mA}$ (2)		V_{OL}	-	0,5	V

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

*See 3.2.1 of this specification

3.2.2 (contd)

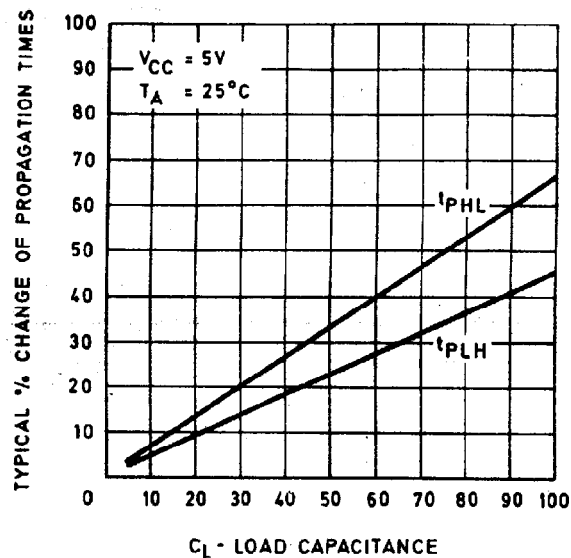
Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Output short circuit current	$V_{IN} = 0V$ or $4,5V$ $V_O = 0V$ (3)	$V_{CC} \text{ max.}$	$-I_{OSA}$	40,0	225,0	mA
Propagation times All types	$T_{amb} = 25^{\circ}C$ * test conditions as in Sub-group A5	5,0V	t_{PHL} t_{PLH}	- -	18,0 18,0	ns ns
High impedance to Low level (output enable)			t_{PZL}	-	30,0	ns
High impedance to High level (output enable)			t_{PZH}	-	23,0	ns
Low level to high impedance (output disable)			t_{PLZ}	-	25,0	ns
High level to high impedance (output disable)			t_{PHZ}	-	18,0	ns

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

*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

