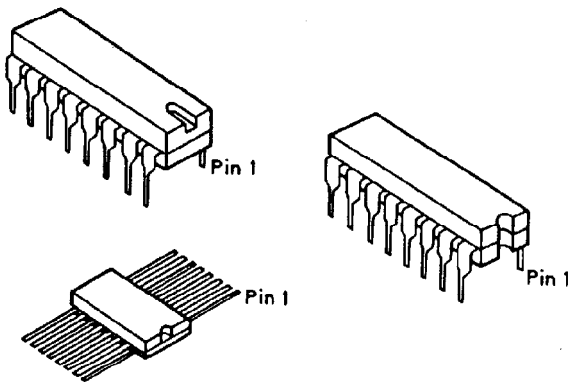


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON. W1A 2BS	BS CECC 90103 - 057 ISSUE 1 JULY 1981 Page 1 of 18 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	 MANUFACTURERS TYPE NUMBER 54LS138 64LS138 74LS138 84LS138 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)	3-TO-8 LINE DECODERS/ DEMULTIPLEXERS 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

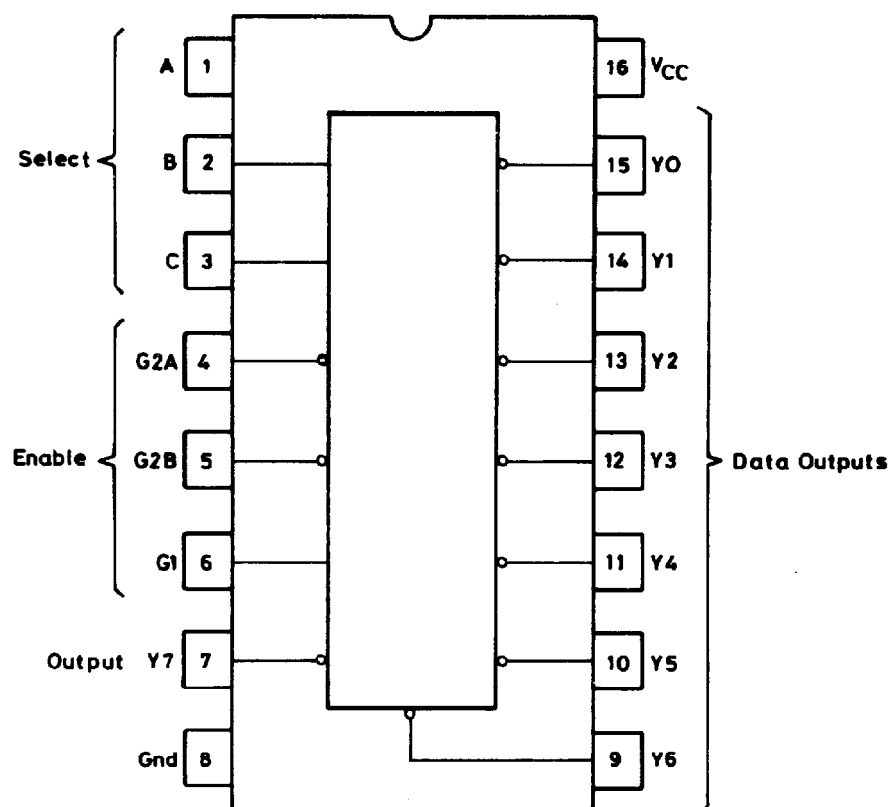
1.1 Truth table (contd)

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

*G2 = G2A + G2B
H = High level
L = Low level
X = Logic level irrelevant

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



3-to-8 Line decoders/demultiplexers

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74LS138J	N	W
-25 + 85	84LS138J		
-40 + 85	64LS138J		
-55 +125	54LS138J		

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).

1. 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						-0,5V +7,0V
2.2.1	Maximum input voltage	V_I					+5,5V
2.2.2	Maximum input voltage between multiple emitter transistor inputs	V_{II}					
2.3	Minimum and maximum operating ambient temperatures	$T_{amb}(^{\circ}C)$	min. max.	-55 +125	64LS +85	74LS +70	84LS -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
Minimum 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			

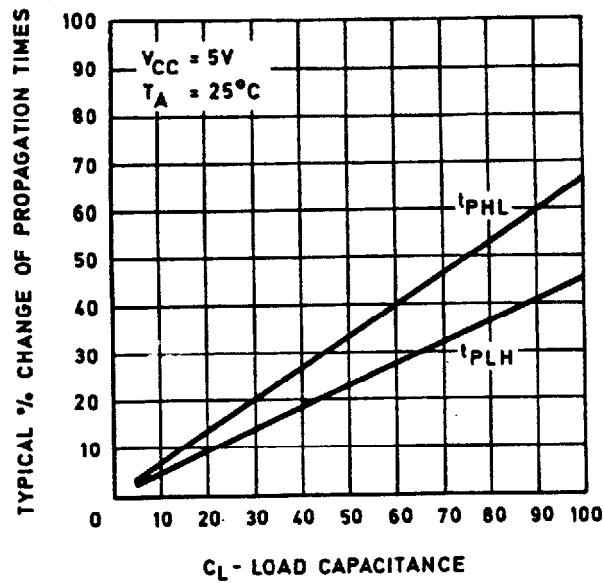
3.2.2

Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Total supply current per package	Outputs enabled and open	V_{CC} max.	I_{CC}	-	10,0	mA
High level input current	$V_{IH(1)} = 7,0V$ $V_{IH(2)} = 2,7V$	V_{CC} max.	$I_{IH(1)}$	-	100,0	μA
			$I_{IH(2)}$	-	20,0	μA
Low level input current	$V_{IN} = 0,4V$	V_{CC} max.	$-I_{IL}$	-	0,4	mA
Input clamping voltage	$-I_{IC} = 18,0mA$	V_{CC} min.	$-V_{ICA}$	-	1,5	V
Output voltage	54LS $I_{OH} = -400,0\mu A$	V_{CC} min.	V_{OH}	2,5	-	V
	64/74/84LS $I_{OH} = -400,0\mu A$		V_{OH}	2,7	-	V
	All types $I_{OL(1)} = 4,0mA$ (1)		$V_{OL(1)}$	-	0,4	V
	64/74/84LS $I_{OL(2)} = 8,0mA$ (2)		$V_{OL(2)}$	-	0,5	V
Output short circuit current	$V_O = 0V$ (3) or 4,5V	V_{CC} max.	$-I_{OS}$	5,0	130,0	mA
Propagation time	$T_{amb} = 25^\circ C^*$ test conditions as in Sub-group A5	5,0V				
Binary select inputs to any output	(2 levels of delay) (3 levels of delay)		t_{PLH}	-	20,0	ns
			t_{PLH}	-	27,0	ns
Enable inputs to any output	(2 levels of delay) (3 levels of delay)		t_{PLH}	-	18,0	ns
			t_{PLH}	-	26,0	ns
Binary select inputs to any output	(2 levels of delay) (3 levels of delay)		t_{PHL}	-	41,0	ns
			t_{PHL}	-	39,0	ns
Enable inputs to any outputs	(2 levels of delay) (3 levels of delay)		t_{PHL}	-	32,0	ns
			t_{PHL}	-	38,0	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

Supplementary information

Change of typical propagation time with output loading



Propagation time Vs. load capacitance

3.2 Variation of propagation time with temperature

