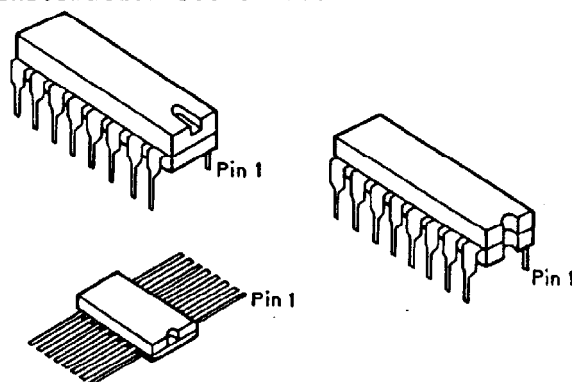


BRITISH STANDARDS INSTITUTION 2 PARK STREET, LONDON, W1A 2BS	BS CECC 90103 - 064 ISSUE 1 JULY 1981 Page 1 of 18 pages
Specification available from:- AS SHOWN IN PD 9002 AND CECC 00 200 AND	
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH: BS CECC 90 000 : 1976 BS CECC 90 100 : 1977	MANUFACTURERS TYPE NUMBER 54LS156 64LS156 74LS156 84LS156 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)	DUAL 2-LINE TO 4-LINE DECODER/DEMULTIPLEXERS WITH OPEN COLLECTOR 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)

2-LINE TO 4-LINE DECODER OR
1-LINE TO 4-LINE DEMULTIPLEXER

INPUTS				OUTPUTS			
SELECT		STROBE DATA		1Y0	1Y1	1Y2	1Y3
B	A	G1	C1				
X	X	H	X	H	H	H	H
L	L	L	H	L	H	H	H
L	H	L	H	H	L	H	H
H	L	L	H	H	H	L	H
H	H	L	H	H	H	H	L
X	X	X	L	H	H	H	H

2-LINE TO 4-LINE DECODER OR
1-LINE TO 4-LINE DEMULTIPLEXER

INPUTS				OUTPUTS			
SELECT		STROBE DATA		2Y0	2Y1	2Y2	2Y3
B	A	G2	C2				
X	X	H	X	H	H	H	H
L	L	L	L	L	H	H	H
L	H	L	L	H	L	H	H
H	L	L	L	H	H	L	H
H	H	L	L	H	H	H	L
X	X	X	H	H	H	H	H

3-LINE TO 8-LINE DECODER,
OR 1-LINE TO 8-LINE DEMULTIPLEXER

INPUTS				OUTPUTS							
SELECT			STROBE OR DATA	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
+C	B	A	+G	2Y0	2Y1	2Y2	2Y3	1Y0	1Y1	1Y2	1Y3
X	X	X	H	H	H	H	H	H	H	H	H
L	L	L	L	L	H	H	H	H	H	H	H
L	L	H	L	H	L	H	H	H	H	H	H
L	H	L	L	H	H	L	H	H	H	H	H
L	H	H	L	H	H	H	L	H	H	H	H
H	L	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	L	H	H
H	H	L	L	H	H	H	H	H	H	L	H
H	H	H	L	H	H	H	H	H	H	H	L

+C = inputs C1 and C2 connected together

+G = inputs G1 and G2 connected together

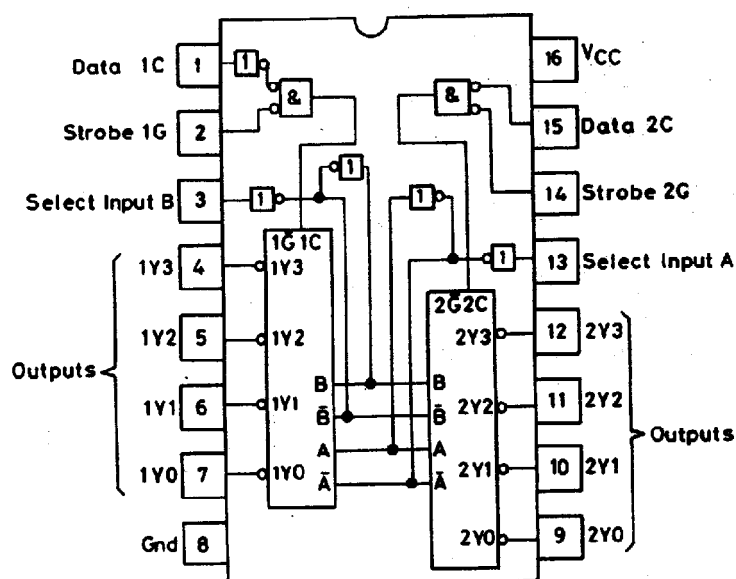
H = High level

L = Low level

X = Logic level irrelevant

1.2 Terminal identification, type designation and marking

1.2.1 Terminal identification



Dual 2-line to 4-line decoders/demultiplexers
with open collector outputs

1.2.2 Type designation

TEMPERATURE RANGE	PACKAGE		
	Ceramic Dual-in-Line	Plastic Dual-in-Line	Ceramic Flatpack
0 + 70	74LS156J	N	W
-25 + 85	84LS156J		
-40 + 85	64LS156J		
-55 +125	54LS156J		

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 voltage	V_I						-0,5V +7,0V
2.3	Minimum and maximum operating ambient temperatures	$T_{amb}(^{\circ}C)$	min. max.	54LS -55 +125	64LS -40 +85	74LS 0 +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
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 leakage for each output at V_{OH}	$-I_{OHX}$	All types	100,0	μA
Maximum value of applied off-state output voltage	V_{OHA}	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} = 4,5V to inputs A, B and C1. Other inputs at 0V outputs open	V _{CC} max.	I _{CC}	-	10,0	mA
High level input current	V _{IH(1)} = 7,0V	V _{CC} max.	I _{IH(1)}	-	0,1	mA
	V _{IH(2)} = 2,7V	V _{CC} max.	I _{IH(2)}	-	20,0	µA
Low level input current	V _{IN} = V _{OLA}	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 All types 64/74/84LS	I _{OL(1)} = 4,0mA (1)	V _{CC} min.	V _{OL(1)}	-	0,4	V
	I _{OL(2)} = 8,0mA (2)		V _{OL(2)}	-	0,5	V
Propagation times All types	T _{amb} = 25°C* test conditions as in Sub-group A5	5,0V				
High to Low level A,B,C2,C1 or C2 to Y (2 levels of logic) Input select A or B to Y (3 levels of logic) Data C1 to Y (3 levels of logic)			t _{PHL}	-	51,0	ns
			t _{PHL}	-	51,0	ns
			t _{PHL}	-	48,0	ns

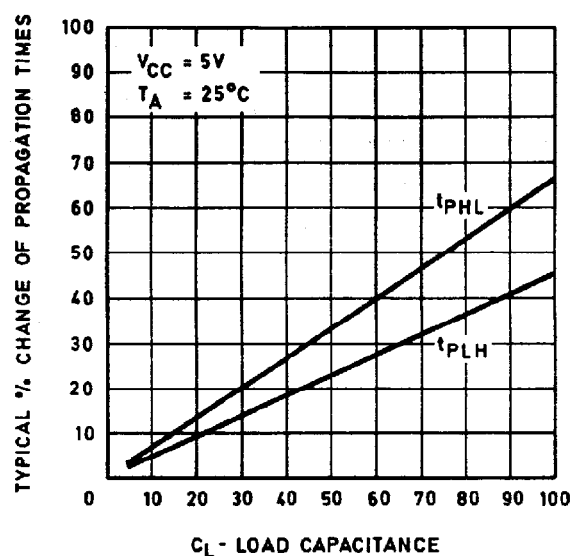
(1) Fan out = 10, (2) Fan out = 20,
*See 3.2.1 of this specification

3.2.2 (contd)

Characteristics	Conditions	$V_{CC}(V)$	Symbol	Min.	Max.	Unit
Low to High level A,B,C2,G1 or G2 to Y (2 levels of logic)			t_{PLH}	-	40,0	ns
Input select A or B to Y (3 levels of logic)			t_{PLH}	-	46,0	ns
Data C1 to Y (3 levels of logic)			t_{PLH}	-	48,0	ns

3.3 Supplementary information

3.3.1 Change of typical propagation time with output loading



Propagation times Vs. load capacitance