

Dual AND-OR gate

74HC58

FEATURES

- Output capability: standard
- I_{CC} category: SSI

GENERAL DESCRIPTION

The 74HC58 is a high-speed Si-gate CMOS device and is pin compatible with low power Schottky TTL (LSTTL). It is specified in compliance with JEDEC standard no. 7A.

The "58" provides two sections of AND-OR gates. One section contains a 2-wide, 3-input (1A to 1F) AND-OR gate and the second section contains a 2-wide, 2-input (2A to 2D) AND-OR gate.

QUICK REFERENCE DATA

GND = 0 V; $T_{amb} = 15\text{ }^{\circ}\text{C}$; $t_r = t_f = 6\text{ ns}$

SYMBOL	PARAMETER	CONDITIONS	TYPICAL	UNIT
			HC	
t_{PHL}/t_{PLH}	propagation delay	$C_L = 15\text{ pF}$; $V_{CC} = 5\text{ V}$		
	1n to 1Y		11	ns
	2n to 2Y		9	ns
C_I	input capacitance		3.5	pF
C_{PD}	power dissipation capacitance per gate	notes 1 and 2	18	pF

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μW):

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz

f_o = output frequency in MHz

C_L = output load capacitance in pF

V_{CC} = supply voltage in V

$\sum (C_L \times V_{CC}^2 \times f_o)$ = sum of outputs

2. For HC the condition is $V_I = \text{GND to } V_{CC}$

ORDERING INFORMATION

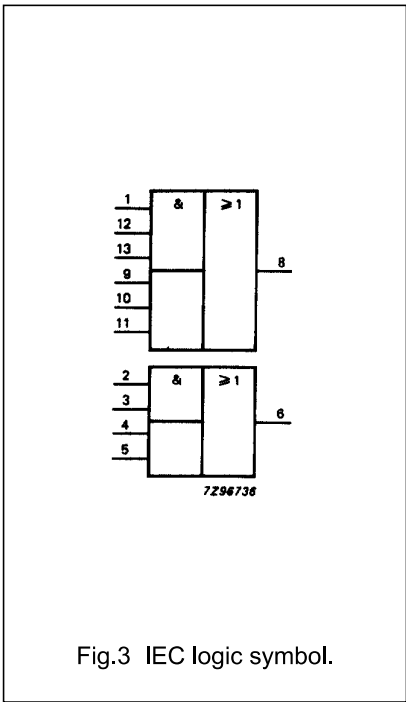
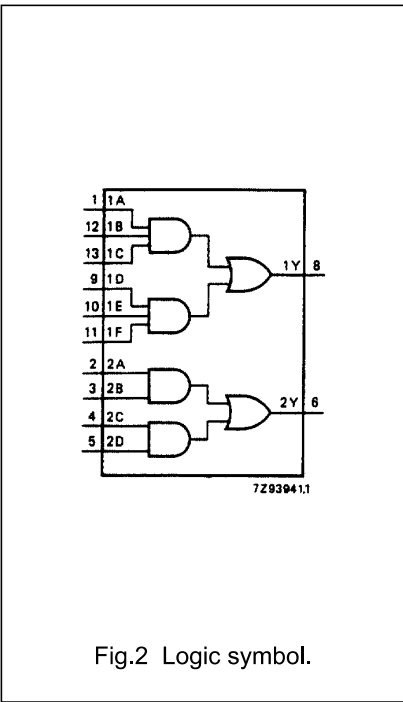
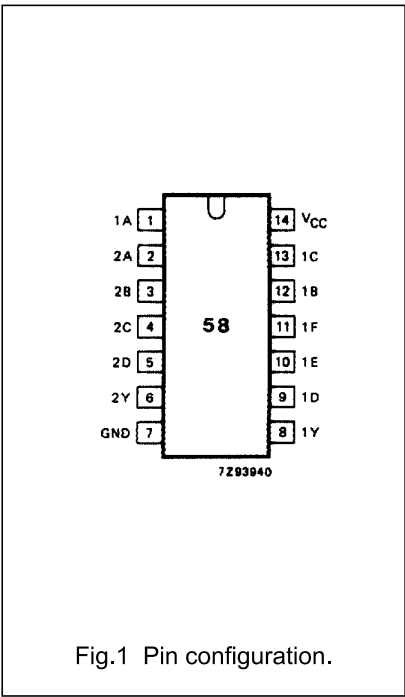
See "74HC/HCT/HCU/HCMOS Logic Package Information".

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PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1, 12, 13, 9, 10, 11	1A to 1F	data inputs
2, 3, 4, 5	2A to 2D	data inputs
8, 6	1Y, 2Y	data outputs
7	GND	ground (0 V)
14	V _{CC}	positive supply voltage



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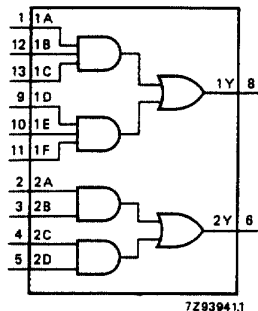


Fig.4 Functional diagram.

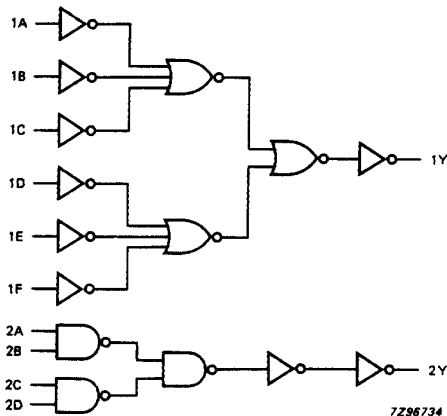


Fig.5 Logic diagram.

FUNCTION TABLE (1)

INPUTS						OUTPUT
1A	1B	1C	1D	1E	1F	1Y
L	X	X	L	X	X	L
L	X	X	X	L	X	L
L	X	X	X	X	L	L
X	L	X	L	X	X	L
X	L	X	X	L	X	L
X	L	X	X	X	L	L
X	X	L	L	X	X	L
X	X	L	X	L	X	L
X	X	L	X	X	L	L
X	X	X	H	H	H	H
H	H	H	X	X	X	H

INPUTS				OUTPUT
2A	2B	2C	2D	2Y
L	X	L	X	L
L	X	X	L	L
X	L	L	X	L
X	L	X	L	L
X	X	H	H	H
H	H	X	X	H

Note

- 1. H = HIGH voltage level
- L = LOW voltage level
- X = don't care

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DC CHARACTERISTICS FOR 74HC

Output capability: standard
I_{CC} category: SSI

AC CHARACTERISTICS FOR 74HC

GND = 0 V; t_r = t_f = 6 ns; C_L = 50 pF

SYMBOL	PARAMETER	T _{amb} (°C)							UNIT	TEST CONDITIONS	
		74HC								V _{CC} (V)	WAVEFORMS
		+25			−40 to +85		−40 to +125				
		min.	typ.	max.	min.	max.	min.	max.			
t _{PHL} / t _{PLH}	propagation delay 1A,1B,1C,1D,1E, 1F to 1Y		36 13 10	115 23 20		145 29 25		175 35 30	ns	2.0 4.5 6.0	Fig.6
t _{PHL} / t _{PLH}	propagation delay 2A,2B,2C,2D to 2Y		30 11 9	100 20 17		125 25 21		150 30 26	ns	2.0 4.5 6.0	Fig.6
t _{THL} / t _{TLH}	output transition time		19 7 6	75 15 13		95 19 16		110 22 19	ns	2.0 4.5 6.0	Fig.6

AC WAVEFORMS

