

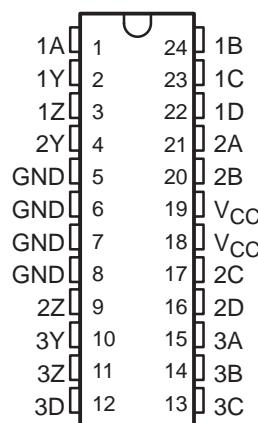
- Suitable for Use in Applications Such as:
 - Differential Line Drivers
 - Complementary Input Circuits for Decoders and Code Converters
- Flow-Through Architecture Optimizes PCB Layout
- Center-Pin V_{CC} and GND Pin Configurations Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C

description

The 74AC11800 is a triple 4-input AND/NAND gate. Elimination of decode spikes in symmetrical decoder and code-converter applications makes the device useful for applications such as a decoder or differential line driver.

The 74AC11800 is characterized for operation from –40°C to 85°C.

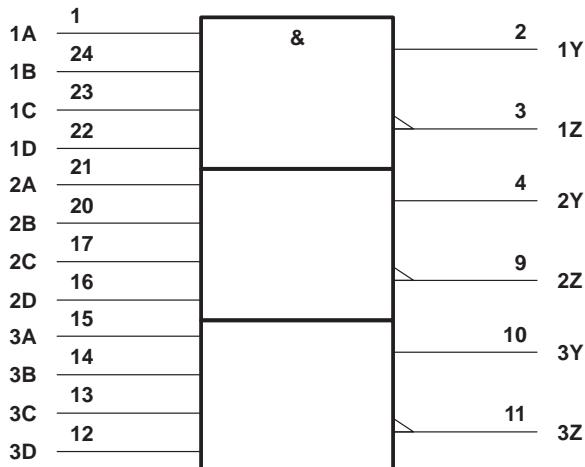
DW PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS				OUTPUTS	
A	B	C	D	Y	Z
L	X	X	X	L	H
X	L	X	X	L	H
X	X	L	X	L	H
X	X	X	L	L	H
H	H	H	H	H	L

logic symbol†



logic diagram, each section (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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TEXAS
INSTRUMENTS

74AC11800

TRIPLE 4-INPUT AND/NAND GATES

SCAS233 – AUGUST 1992 – REVISED APRIL 1993

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

Supply voltage range, V_{CC}	–0.5 V to 7 V
Input voltage range, V_I (see Note 1)	–0.5 V to V_{CC} + 0.5 V
Output voltage range, V_O (see Note 1)	–0.5 V to V_{CC} + 0.5 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$)	±50 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	±50 mA
Continuous current through V_{CC} or GND	±150 mA
Storage temperature range	–65°C to 150°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions (see Note 2)

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	3	5	5.5	V
V_{IH}	High-level input voltage	$V_{CC} = 3$ V	2.1		V
		$V_{CC} = 4.5$ V	3.15		
		$V_{CC} = 5.5$ V	3.85		
V_{IL}	Low-level input voltage	$V_{CC} = 3$ V	0.9		V
		$V_{CC} = 4.5$ V	1.35		
		$V_{CC} = 5.5$ V	1.65		
V_I	Input voltage	0	V_{CC}		V
V_O	Output voltage	0	V_{CC}		V
I_{OH}	High-level output current	$V_{CC} = 3$ V	–4		mA
		$V_{CC} = 4.5$ V	–24		
		$V_{CC} = 5.5$ V	–24		
I_{OL}	Low-level output current	$V_{CC} = 3$ V	12		mA
		$V_{CC} = 4.5$ V	24		
		$V_{CC} = 5.5$ V	24		
$\Delta t/\Delta v$	Input transition rise or fall rate	0	10		ns/V
T_A	Operating free-air temperature	–40	85		°C

NOTE 2: Unused or floating inputs must be held high or low.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
V _{OH}	I _{OH} = -50 µA	3 V	2.9		2.9	V		
		4.5 V	4.4		4.4			
		5.5 V	5.4		5.4			
	I _{OH} = -4 mA	3 V	2.58		2.48			
		4.5 V	3.94		3.8			
	I _{OL} = -24 mA	5.5 V	4.94		4.8			
		5.5 V			3.85			
	I _{OH} = -75 mA†							
V _{OL}	I _{OL} = 50 µA	3 V	0.1		0.1	V		
		4.5 V	0.1		0.1			
		5.5 V	0.1		0.1			
	I _{OL} = 12 mA	3 V	0.36		0.44			
		4.5 V	0.36		0.44			
	I _{OL} = 24 mA	5.5 V	0.36		0.44			
		5.5 V			1.65			
I _I	V _I = V _{CC} or GND	5.5 V		±0.1		±1	µA	
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V		4		40	µA	
C _i	V _I = V _{CC} or GND	5 V		4			pF	

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t _{PLH}	A, B, C, or D	Y or Z	2.5	5.8	9.8	2.5	10.7	ns
			2.7	6.2	10.9	2.7	12	

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			MIN	MAX	UNIT
			MIN	TYP	MAX			
t _{PLH}	A, B, C, or D	Y or Z	2.2	4.6	7.2	2.2	7.7	ns
			2.3	4.8	7.7	2.3	8.4	

operating characteristics, V_{CC} = 5 V, T_A = 25°C

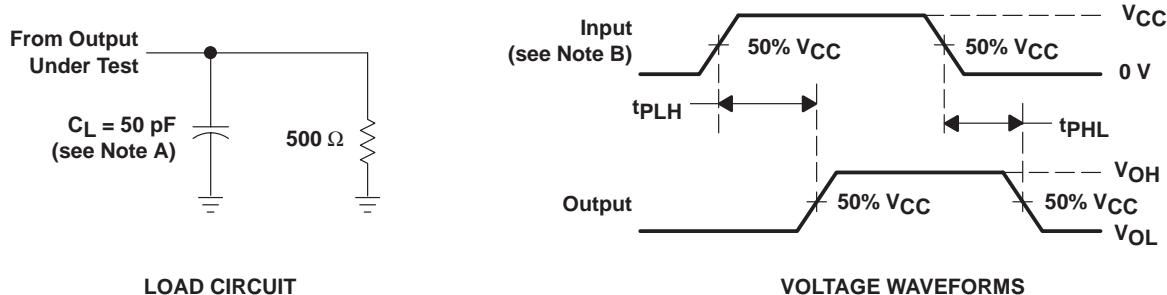
PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd}	Power dissipation capacitance per gate	63	pF

74AC11800

TRIPLE 4-INPUT AND/NAND GATES

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PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.
B. Input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_O = 50 \Omega$, $t_r = 3$ ns, $t_f = 3$ ns.
C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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