

74AC11810

Quadruple 2-Input Exclusive-NOR Gates

These devices contain four independent Exclusive-NOR gates. They perform the Boolean functions $Y = \overline{A \oplus B} = (A + \overline{B}) \cdot (\overline{A} + B)$ in positive logic.

A common application is a true/complement element. If one of the inputs is high, the other input will be reproduced in true form at the output. If one of the inputs is low, the signal on the other input will be reproduced inverted at the output.

The 54AC11810 is characterized for operation over the full military temperature range of -55°C to 125°C. The 74AC11810 is characterized for operation from -40°C to 85°C.

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All re-creations are done with the approval of the Original Component Manufacturer (OCM).

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
 - Class Q Military
 - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
 - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

FOR REFERENCE ONLY

**54AC11810, 74AC11810
QUADRUPLE 2-INPUT EXCLUSIVE-NOR GATES**

T-43-21-00

D3580, JUNE 1990

- Flow-Through Architecture to Optimize PCB Layout
- Center-Pin V_{CC} and GND Configurations to Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs

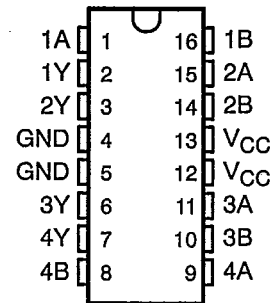
description

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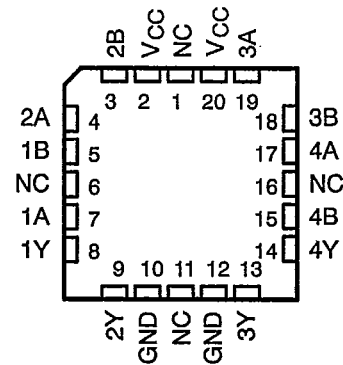
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54AC11810... J PACKAGE
74AC11810... D OR N PACKAGE
(TOP VIEW)



54AC11810... FK PACKAGE
(TOP VIEW)



NC - No internal connection

FUNCTION TABLE

INPUTS		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	H

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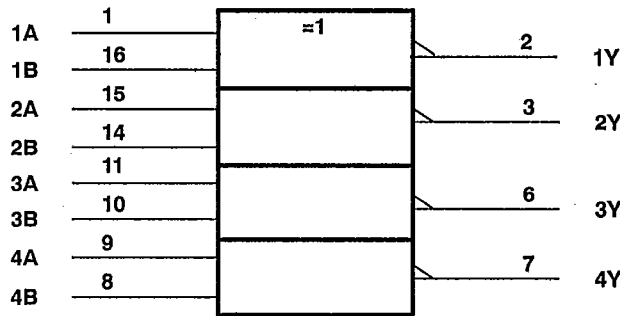


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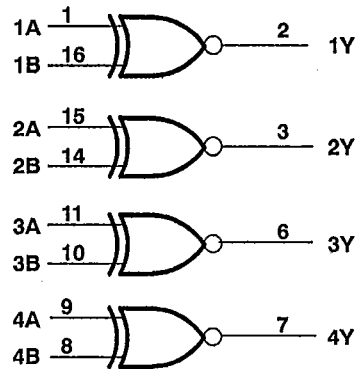
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logic symbol†



logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin numbers shown are for D, J, and N packages.

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 to $V_{CC} + 0.5$ V
Output voltage range, V_O (see Note 1)	-0.5 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 pins	± 100 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 current ratings are observed.

recommended operating conditions

		54AC11810			74AC11810			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	3	5	5.5	3	5	5.5	V
V_{IH}	High-level input voltage	$V_{CC} = 3$ V		2.1	2.1		V	
		$V_{CC} = 4.5$ V		3.15	3.15			
		$V_{CC} = 5.5$ V		3.85	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}	0	V_{CC}	V	
V_O	Output voltage	0		V_{CC}	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	0	10	ns/V	
T_A	Operating free-air temperature	-55		125	-40	85	°C	

PRODUCT PREVIEW information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals. Texas Instruments reserves the right to change or discontinue these products without notice.



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QUADRUPLE 2-INPUT EXCLUSIVE-NOR GATES

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

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			54AC11810		74AC11810		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V _{OH}	I _{OH} = -50 μA	3 V	2.9			2.9		2.9	V	
		4.5 V	4.4			4.4		4.4		
		5.5 V	5.4			5.4		5.4		
	I _{OH} = -4 mA	3 V	2.58			2.4		2.48		
		4.5 V	3.94			3.7		3.8		
	I _{OH} = -24 mA	5.5 V	4.94			4.7		4.8		
		5.5 V				3.85				
5.5 V							3.85			
V _{OL}	I _{OL} = 50 μA	3 V			0.1		0.1	0.1	V	
		4.5 V			0.1		0.1	0.1		
		5.5 V			0.1		0.1	0.1		
	I _{OL} = 12 mA	3 V			0.36		0.5	0.44		
		4.5 V			0.36		0.5	0.44		
	I _{OL} = 24 mA	5.5 V			0.36		0.5	0.44		
		5.5 V					1.65			
5.5 V							1.65			
I _I	V _I = V _{CC} or GND	5.5 V			± 0.1		± 1	± 1	μA	
I _{CC}	V _I = V _{CC} or GND, I _O = 0	5.5 V			4		80	40	μA	
C _i	V _I = V _{CC} or GND	5 V			3.5				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 (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			54AC11810		74AC11810		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A or B	Y	1.7	5.5	7.7	1.8	10.1	1.7	9	ns
t _{PHL}			1.8	5.1	7	1.8	9.1	1.8	8.3	

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			54AC11810		74AC11810		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A or B	Y	1.5	3.9	6.1	1.5	7.9	1.5	7	ns
t _{PHL}			1.6	3.9	5.8	1.6	7.5	1.6	7	

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

PARAMETER	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance	C _L = 50 pF, f = 1 MHz	24	pF

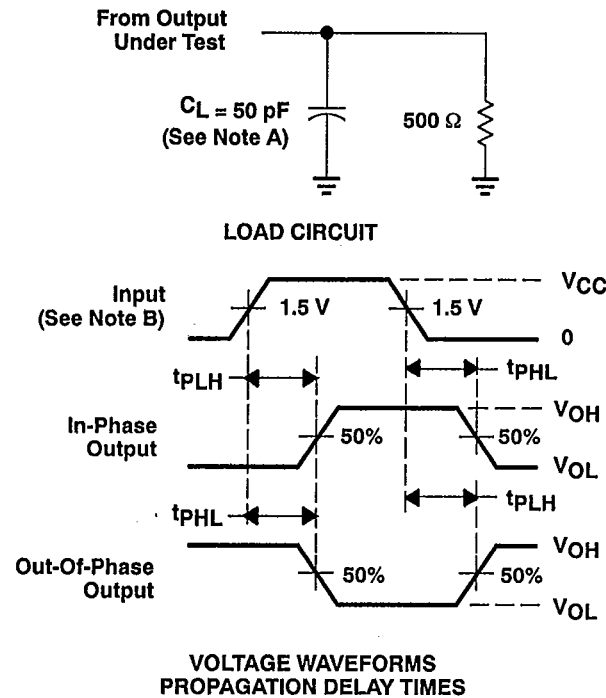
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PARAMETER MEASUREMENT INFORMATION



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

Figure 1. Load Circuit and Voltage Waveforms