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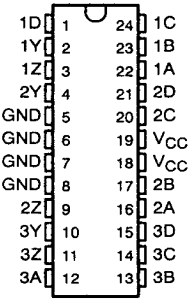
- **Inputs Are TTL-Voltage Compatible**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise**
- **500-mA Typical Latch-Up Immunity at 125°C**
- **EPIC™ (Enhanced-Performance Implanted CMOS) 1-μm Process**
- **Package Options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

54ACT11802 . . . JT PACKAGE
74ACT11802 . . . DW OR NT PACKAGE
(TOP VIEW)

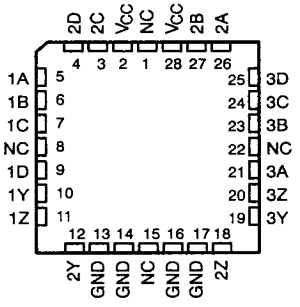


description

The 'ACT11802 contains three independent 4-input AND/NAND gates. They perform the Boolean functions in positive logic $Y = A + B + C + D$ and $Z = \overline{A + B + C + D}$. These devices are designed to have low skew between outputs for clock driver applications.

The 54ACT11802 is characterized for operation over the full military temperature range of –55°C to 125°C. The 74ACT11802 is characterized for operation from –40°C to 85°C.

54ACT11802 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

FUNCTION TABLE

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

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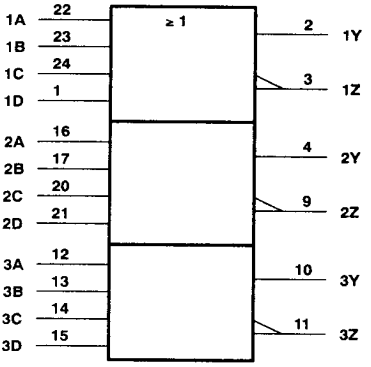
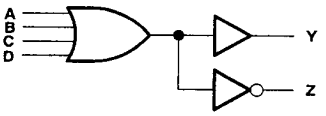
logic symbol†



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

logic diagram (positive logic) (one section)



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 pins . . . . . ± 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 current ratings are observed.

recommended operating conditions

		54ACT11802		74ACT11802		UNIT
		MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V_{IH}	High-level input voltage	2			2	V
V_{IL}	Low-level input voltage		0.8		0.8	V
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		– 24		– 24	mA
I_{OL}	Low-level output current		24		24	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	10	0	10	ns/V
TA	Operating free-air temperature	– 55	125	– 40	85	°C

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

PARAMETER	TEST CONDITIONS	V_{CC}	T_A = 25°C			54ACT11802		74ACT11802		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	I_{OH} = – 50 μA	4.5 V	4.4			4.4		4.4		V
		5.5 V	5.4			5.4		5.4		
	I_{OH} = – 24 mA	4.5 V	3.94			3.7		3.8		
		5.5 V	4.94			4.7		4.8		
	I_{OH} = – 50 mA †	5.5 V				3.85				
	I_{OH} = – 75 mA †	5.5 V						3.85		
V_{OL}	I_{OL} = 50 μA	4.5 V			0.1		0.1		0.1	V
		5.5 V			0.1		0.1		0.1	
	I_{OL} = 24 mA	4.5 V			0.36		0.5		0.44	
		5.5 V			0.36		0.5		0.44	
	I_{OL} = 50 mA †	5.5 V					1.65			
	IOL = 75 mA †	5.5 V							1.65	
I_I	V_I = V_{CC} or GND	5.5 V			± 0.1		± 0.1		± 0.1	mA
I_{CC}	V_I = V_{CC} or GND, I_O = 0	5.5 V			4		80		40	mA
ΔI_{CC} ‡	One input at 3.4 V, Other inputs at GND or V_{CC}	5.5 V			0.9		1		1	mA
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.
‡ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather that 0 V to V_{CC}.

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			54AC11802		74AC11802		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	Y		3.8						ns
t_{PHL}				3.8						

NOTE 2: Load circuit and voltage waveforms are shown in Section 1.

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

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance per gate	C_L = 50 pF, f = 1 MHz	27	pF

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