

**SN5437, SN54LS37, SN54S37,
SN7437, SN74LS37, SN74S37**
QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

DECEMBER 1983—REVISED MARCH 1986

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

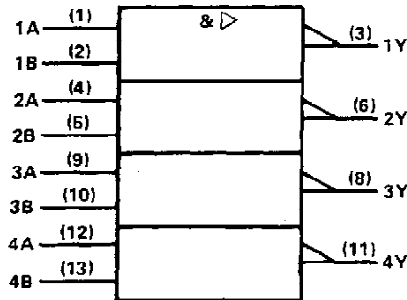
These devices contain four independent 2-input NAND buffer gates.

The SN5437, SN54LS37 and SN54S37 are characterized for operation over the full military range of -55°C to 125°C. The SN7437, SN74LS37 and SN74S37 are characterized for operation from 0°C to 70°C.

FUNCTION TABLE (each gate)

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

logic symbol†



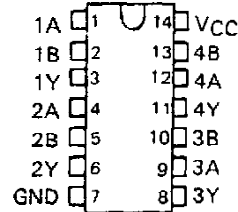
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for D, J, N, and W packages.

SN5437, SN54LS37, SN54S37 . . . J OR W PACKAGE
SN7437 . . . N PACKAGE

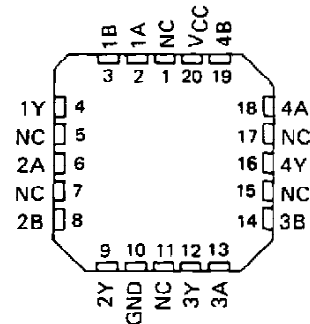
SN74LS37, SN74S37 . . . D OR N PACKAGE

(TOP VIEW)



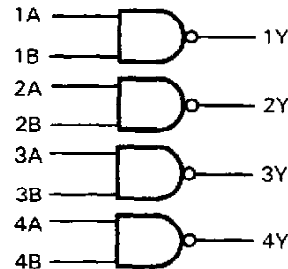
SN54LS37, SN54S37 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

logic diagram



positive logic

$$Y = A \cdot B \text{ or } Y = \overline{A + B}$$

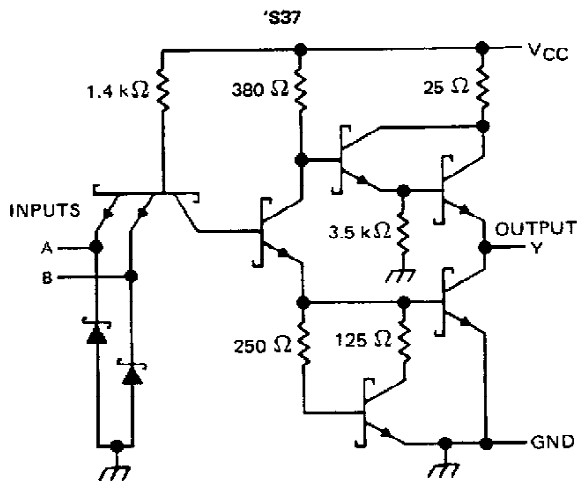
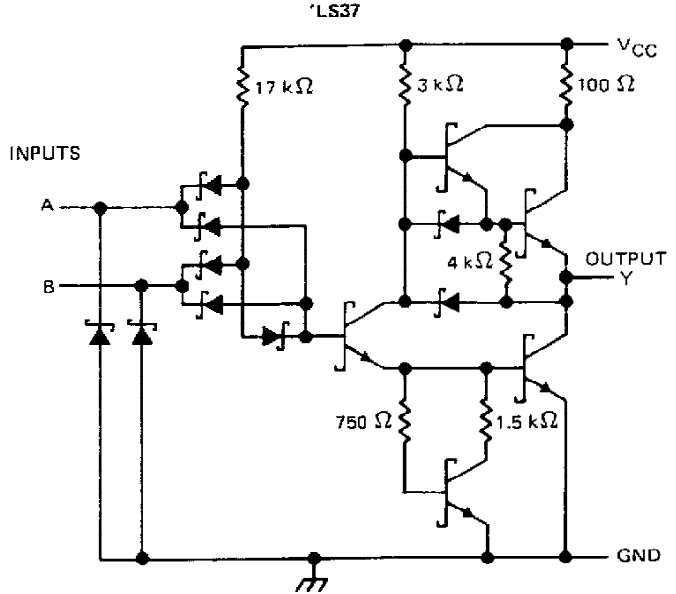
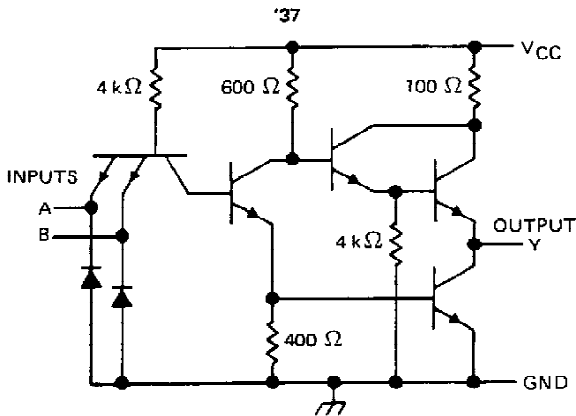
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**SN5437, SN54LS37, SN437
SN7437, SN74LS37, SN7437
QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS**

schematics (each gate)



Resistor values shown are nominal.

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage: '37, 'S37	5.5 V
'LS37	7 V
Operating free-air temperature: SN54'	-55°C to 125°C
SN74'	0°C to 70°C
Storage temperature range	-65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.



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SN5437, SN7437
QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

recommended operating conditions

	SN5437			SN7437			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC} Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH} High-level input voltage	2			2			V
V _{IL} Low-level input voltage			0.8			0.8	V
I _{OH} High-level output current			-1.2			-1.2	mA
I _{OL} Low-level output current			48			48	mA
T _A Operating free-air temperature	-55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS †	SN5437			SN7437			UNIT
		MIN	TYP ‡	MAX	MIN	TYP ‡	MAX	
V _{IK}	V _{CC} = MIN, I _I = -12 mA			-1.5			-1.5	V
V _{OH}	V _{CC} = MIN, V _{IL} = 0.8 V, I _{OH} = -1.2 mA	2.4	3.3		2.4	3.3		V
V _{OL}	V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 48 mA		0.2	0.4		0.2	0.4	V
I _I	V _{CC} = MAX, V _I = 6.5 V			1			1	mA
I _{IH}	V _{CC} = MAX, V _I = 2.4 V			40			40	µA
I _{IL}	V _{CC} = MAX, V _I = 0.4 V			-1.6			-1.6	mA
I _{OS} §	V _{CC} = MAX	-20		-70	-18		-70	mA
I _{CCH}	V _{CC} = MAX, V _I = 0 V		9	15.5		9	15.5	mA
I _{CCL}	V _{CC} = MAX, V _I = 4.5 V		34	54		34	54	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t _{PLH}	A or B	Y	R _L = 133 Ω, C _L = 45 pF		13	22	ns
t _{PHL}				8	15	ns	

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

SN54LS37, SN74LS37 QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

recommended operating conditions

	SN54LS37			SN74LS37			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC} Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH} High-level input voltage	2			2			V
V _{IL} Low-level input voltage	0.7			0.8			V
I _{OH} High-level output current	-1.2			-1.2			mA
I _{OL} Low-level output current	12			24			mA
T _A Operating free-air temperature	-55			125			°C

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

PARAMETER	TEST CONDITIONS †	SN54LS37			SN74LS37			UNIT
		MIN	TYP ‡	MAX	MIN	TYP ‡	MAX	
V _{IK}	V _{CC} = MIN, I _I = -18 mA	-1.5			-1.5			V
V _{OH}	V _{CC} = MIN, V _{IL} = MAX, I _{OH} = -1.2 mA	2.5	3.4		2.7	3.4	V	
V _{OL}	V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 12 mA	0.25	0.4		0.25	0.4	V	
	V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 24 mA				0.35	0.5		
I _I	V _{CC} = MAX, V _I = 7 V	0.1			0.1			mA
I _{IH}	V _{CC} = MAX, V _I = 2.7 V	20			20			µA
I _{IL}	V _{CC} = MAX, V _I = 0.4 V	-0.4			-0.4			mA
I _{OS} §	V _{CC} = MAX	-30	-130		-30	-130	mA	
I _{CCH}	V _{CC} = MAX, V _I = 0 V	0.9			0.9			mA
I _{CCL}	V _{CC} = MAX, V _I = 4.5 V	6	12		6	12	mA	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time, and the duration of the short-circuit should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t _{PLH}	A or B	Y	R _L = 667 Ω,	C _L = 46 pF		12	24	ns
t _{PHL}						12	24	ns

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



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SN54S37, SN74S37 QUADRUPLE 2-INPUT POSITIVE-NAND BUFFERS

recommended operating conditions

	SN54S37			SN74S37			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
V _{CC} Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V _{IH} High-level input voltage	2			2			V
V _{IL} Low-level input voltage				0.8			V
I _{OH} High-level output current				-3			mA
I _{OL} Low-level output current				60			mA
T _A Operating free-air temperature	-55			125			°C

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

PARAMETER	TEST CONDITIONS †	SN54S37			SN74S37			UNIT	
		MIN	TYP ‡	MAX	MIN	TYP ‡	MAX		
V _{IK}	V _{CC} = MIN, I _I = -18 mA	-1.2			-1.2			V	
V _{OH}	V _{CC} = MIN, V _{IL} = 0.8 V, I _{OH} = -3 mA	2.5	3.4		2.7	3.4		V	
V _{OL}	V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 60 mA	0.5			0.5			V	
I _I	V _{CC} = MAX, V _I = 5.5 V	1			1			mA	
I _{IH}	V _{CC} = MAX, V _I = 2.7 V	0.1			0.1			mA	
I _{IL}	V _{CC} = MAX, V _I = 0.5 V	-4			-4			mA	
I _{OS} §	V _{CC} = MAX	-50		-225	-50		-225	mA	
I _{CCH}	V _{CC} = MAX, V _I = 0 V	20			20			36	mA
I _{CCL}	V _{CC} = MAX, V _I = 4.5	46			46			80	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed 100 milliseconds.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t _{PLH}	A or B	Y	R _L = 93 Ω, C _L = 50 pF	4	6.5		ns
t _{PHL}				4	6.5		ns
t _{PLH}			R _L = 93 Ω, C _L = 150 pF	6			ns
t _{PHL}				6			ns

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


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SN74S37, Quad 2-input positive-NAND buffers

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54S37	SN74S37
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.75 to 5.25
Input Level	TTL	TTL
Output Level	TTL	TTL
Output Drive (mA)		-3/60
No. of Gates	4	4
Static Current		58
tpd max (ns)		6.5

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- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

DESCRIPTION

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These devices contain four independent 2-input NAND buffer gates.

The SN5437, SN54LS37 and SN54S37 are characterized for operation over the full military range of -55°C to 125°C. The SN7437, SN74LS37 and SN74S37 are characterized for operation from 0°C to 70°C.

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- [Evaluation of Nickel/Palladium/Gold-Finished Surface-Mount Integrated Circuits \(SZZA026](#) - Updated: 06/20/2001)
- [Input and Output Characteristics of Digital Integrated Circuits \(SDYA010](#) - Updated: 10/01/1996)
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- [Military Semiconductors Selection Guide 2002 \(Rev. B\) \(SGYC003B, 1648 KB](#) - Updated: 04/22/2002)

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DEVICE INFORMATION							TI INVENTORY STATUS AS OF 3:00 PM GMT, 26 Sep 2002			REPORTED DISTRIBUTOR INVENTORY AS OF 3:00 PM GMT, 26 Sep 2002		
ORDERABLE DEVICE	STATUS	PACKAGE TYPE PINS	TEMP (°C)	PRODUCT CONTENT	BUDGETARY PRICING QTY SUS	STD PACK QTY	IN STOCK	IN PROGRESS QTY DATE	LEAD TIME	DISTRIBUTOR COMPANY REGION	IN STOCK	PURCHASE
SN74S37D	ACTIVE	SOP (D) 14	0 TO 70	View Contents	1KU 0.50	50	1000	> 10k 14 Oct	5 WKS			
SN74S37DR	ACTIVE	SOP (D) 14	0 TO 70	View Contents	1KU 0.53	2500	N/A*	1026 25 Sep	5 WKS			
								> 10k 11 Oct				
SN74S37N	ACTIVE	PDIP (N) 14	0 TO 70	View Contents	1KU 0.48	25	500	1800 19 Sep	5 WKS	Avnet AMERICA	> 1k	BUY NOW
								13 25 Sep				
								> 10k 30 Sep				
								250 03 Oct				
								> 10k 07 Oct				
SN74S37N3	OBSOLETE	PDIP (N) 14	0 TO 70	View Contents	1KU		N/A*		Not Available			
SN74S37NSR	ACTIVE	SOP (NS) 14		View Contents	1KU 0.50	2000	N/A*	366 23 Sep	5 WKS			
								> 10k 11 Oct				

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SN74LS37, Quad 2-input positive-NAND buffers

DEVICE STATUS: **ACTIVE**

PARAMETER NAME	SN54LS37	SN74LS37
Voltage Nodes (V)	5	5
Vcc range (V)	4.5 to 5.5	4.75 to 5.25
Input Level	TTL	TTL
Output Level	TTL	TTL
Output Drive (mA)		-1.2/24
No. of Gates	4	4
Static Current		7
tpd max (ns)		24

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DESCRIPTION

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SN74LS37D	OBSOLETE	SOP (D) 14	0 TO 70	View Contents	1KU		N/A*		Not Available			
SN74LS37N	ACTIVE	PDIP (N) 14	0 TO 70	View Contents	1KU 0.31	25	N/A*	> 10k 04 Oct	4 WKS	Avnet AMERICA	> 1k	BUY NOW
								> 10k 07 Oct				
								6821 04 Nov				
								> 10k 12 Nov				
								> 10k 25 Nov				
SN74LS37N3	OBSOLETE	PDIP (N) 14	0 TO 70	View Contents	1KU		N/A*		Not Available			
SN74LS37NSR	ACTIVE	SOP (NS) 14		View Contents	1KU 0.31	2000	N/A*	1215 23 Sep	4 WKS			
								> 10k 04 Oct				
								> 10k 11 Oct				
								> 10k 18 Oct				
								> 10k 08 Nov				

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