SN54136, SN54LS136 ... J OR W PACKAGE
SN74136 ... N PACKAGE
SN74LS136 ... D OR N PACKAGE
(TOP VIEW)

1A 1 1 1 14 VCC

SN54LS136 ... FK PACKAGE (TOP VIEW) Ø 4 2 2 3 8

> 2 10 11 12 13 2 9 2 8 8

NC - No internal connection

13 4B

12 4A

110 47

10 3B

9 3A 8 3Y

17[] NC

16 74Y

15 [NC

14 [] 3B

18 □2

1Y 🗆3

2A 🛮 4

28 □5

2Y 🛮 6

GND [

1Y] 4 NC] 5 2A] 6 NC] 7

28 18

FUNCTIO	N TABLE

INP	UTS	OUTPUT
A	8	Y
L	L	L
L	H	н
н	L	н
н	н	L

H = high level, L = low level

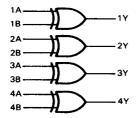
logic symbol†

(3)		
1A (1)	=1 ♀	(3) 1Y
1B (2) 2A (4)	×	.,
2A (4)		(6)
2B (5)		
2B (9) 3A (10)		(8)
38 (10)	1	(6) 3Y
38 (10) 4A (12)		(22)
4B (13)		(11) 4Y
4D	1	I

[†]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.

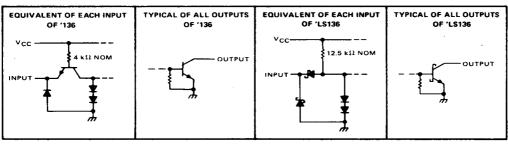
logic diagram (each gate)



positive logic

$$Y = A \oplus B = \overline{A} \cdot B + A \cdot \overline{B}$$

schematics of inputs and outputs



Resistor values shown are nominal.

PRODUCTION DATA documents contain information current as of publication data. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include setting of all parameters.



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TTL Devices

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

recommended operating conditions

		6		UNIT			
	MIN	NOM	MAX	MIN	NOM	MAX	Civil
Supply voltage, VCC	4.5	5	5.5	4.75	5	5.25	>
High-level input voltage, VIH	2			2			>
Low-level input voltage, VIL			0.8			0.8	
High-level output voltage, VOH			5.5			5.5	V.
Low-level output current, IQL			16			16	mA
Operating free-air temperature, TA	- 55		125	0		70	°C

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

						SN5413	6		6	UNIT	
PARAMETER	TEST CONDITIONS					TYP [‡]	MAX	MIN	TYP [‡]	MAX	Olvii
	V _{CC} = MIN,	I ₁ = -8 mA					- 1.5			- 1.5	>
VIK	VCC = MIN,	V _{IH} = 2 V,		V _{OH} = 5.5 V						0.25	mA
юн	V _{CC} = MIN,	V _{IH} = 2 V,					0.25				
Voi	V _{CC} = MIN,			I _{OL} = 16 mA		0.2	0.4		0.2	0.4	
VOL	V _{CC} = MAX,						1			1	mA
	VCC = MAX,						40			40	μΑ
<u> Чн</u>	$V_{CC} = MAX,$						- 1.6			- 1.6	mA
I _I L ICC	V _{CC} = MAX,	See Note 3				30	43		30	50	mA

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

NOTE 2: I_{CC} is measured with one input of each gate at 4.5 V, the other inputs grounded, and the outputs open.

switching characteristics, VCC = 5 V, TA = 25 C

PARAMETER*	FROM (INPUT)	TEST CO	NDITIONS	MIN	TYP	MAX	UNIT	
				1	12	18	l .	
tPLH	A or B	Other input low	Other input low	C _L = 15 pF,	-	39	50	ns
^t PHL	7, 0. 2		R _L = 400 Ω,	<u> </u>				
tniti			_		14	22	ns	
	A or B	Other input high	See Note 3		42	55	7 '''	
tPEH tPHL	A or B	Other input riigh	See Note 3		42	55	<u> </u>	

tpLH propagation delay time, low-to-high-level output



[‡] All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25 \,^{\circ}\text{C}$.

tpLH propagation delay time, high-to-low-level output

NOTE 3: Load circuits and voltage waveforms are shown in Section 1

SN54136, SN74136 QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS

absolute maximum ratings over o	

Supply voltage, VCC (see Note 1)													7 V
Input voltage													7 V
Operating free-air temperature range:	SN54LS136										-55°	C to	125°C
	SN74LS136										. 0	°C to	70°C
Storage temperature range											-65°	C to	150°C

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

recommended operating conditions

	SI	SN54LS136					UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	Civi
Supply voltage, VCC	4.5	5	5.5	4.75	5	5.25	٧
High-level output voltage, VOH			5.5			5.5	٧
Low-level output current, IQL			4			8	mA
Operating free-air temperature, TA	-55		125	0		70	°C

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

			SN54LS136		SN74LS136				
PARAMETER	TEST CONDITIONS	MIN	TYP! MA	X MIN	TYP	MAX	UNIT		
V _{1H} High-level input voltage		2		2			٧		
VIL Low-level input voltage			0	7		8.0			
VIK Input clamp voltage	V _{CC} = MIN, I _I = -18 r	nA	-1	5	-	-1.5	V		
IOH High-level output current	V _{CC} = MIN, V _{IH} = 2 V V _{IL} = V _{IL} max, V _{OH} = 5.	I	10	10		100	μА		
VOI Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V,	пA	0.25 0	.4	0.25	0.4			
VOE LOW CONTROL VOICE	VIL = VIL max OL = 8 r	nA			0.35	0.5			
Input current at maximum input voltag	V _{CC} = MAX, V _I = 7 V		0	2		0.2	mA		
IIH High-level input current	V _{CC} = MAX, V ₁ = 2.7 \	/		10	-	40	μА		
IL Low-level input current	V _{CC} = MAX, V _I = 0.4 \	,	0	.8		-0.8	mA		
ICC Supply current	V _{CC} = MAX, See Note	2	6.1	0	6.1	10	mA		

[†]For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
‡All typical values are at Voc. = 5 V. Th. = 25°C.

 \ddagger All typical values are at V_{CC} = 5 V, T_A = 25 °C. NOTE 2: \dagger _{CC} is measured with one input of each gate at 4.5 V, the other inputs grounded, and the outputs open.

switching characteristics, VCC = 5 V, TA = 25°C

PARAMETER¶	FROM (INPUT)	TEST CO	NDITIONS	MIN	TYP	MAX	UNIT
tPLH	A or B	Other input low	C _L = 15 pF,	T	18	30	ns
tPHL.	A or B	Other impat low	$R_1 = 2 k\Omega_1$		18	30	
^t PLH	A or B	Other input high	(See Note 3)		18	30	ns
tPHL	AUIB	Other input night	(560 11012 0)		18	30	

[¶]tpLH propagation delay time, low-to-high-level output tpLH propagation delay time, high-to-low-level output

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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