

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 recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed 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 OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

SN54136, SN54LS136, SN74136, SN74LS136 QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS

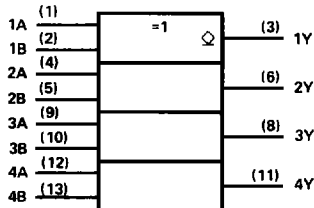
DECEMBER 1972 - REVISED MARCH 1988

FUNCTION TABLE

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

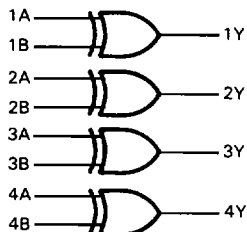
H = high level, L = low level

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.

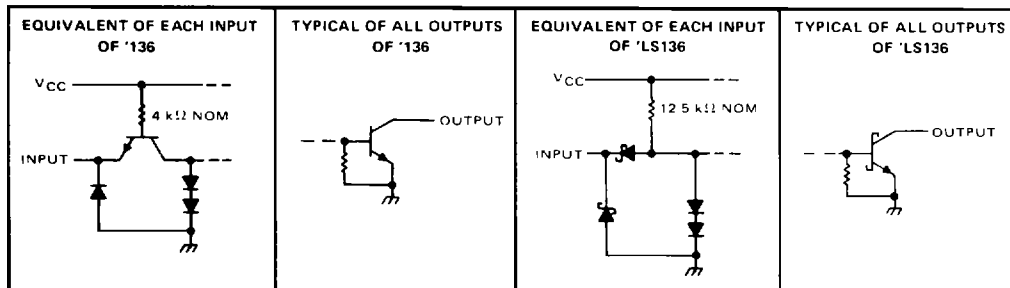
logic diagram (each gate)



positive logic

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

schematics of inputs and outputs



Resistor values shown are nominal.

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

TEXAS
INSTRUMENTS

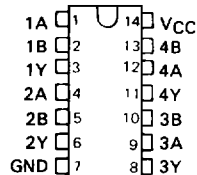
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SN54136, SN54LS136 . . . J OR W PACKAGE

SN74136 . . . N PACKAGE

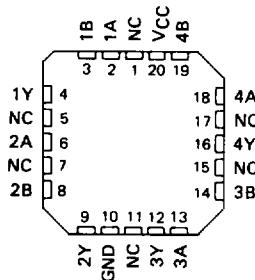
SN74LS136 . . . D OR N PACKAGE

(TOP VIEW)



SN54LS136 . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

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TTL Devices

SN54LS136, SN74LS136 QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES WITH OPEN-COLLECTOR OUTPUTS

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	5.5 V
Operating free air temperature range: SN54136	-55°C to 125°C
SN74136	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

	SN54136			SN74136			UNIT	
	MIN	NOM	MAX	MIN	NOM	MAX		
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V	
High-level input voltage, V_{IH}	2			2			V	
Low-level input voltage, V_{IL}	0.8			0.8			V	
High-level output voltage, V_{OH}	5.5			5.5			V	
Low-level output current, I_{OL}	16			16			mA	
Operating free-air temperature, T_A	-55			0			70	°C

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

PARAMETER	TEST CONDITIONS [†]	SN54136			SN74136			UNIT
		MIN	TYP [‡]	MAX	MIN	TYP [‡]	MAX	
V_{IK}	$V_{CC} = \text{MIN}$, $I_I = -8 \text{ mA}$	-1.5			-1.5			V
I_{OH}	$V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = 0.8 \text{ V}$, $V_{OH} = 5.5 \text{ V}$				0.25			mA
	$V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = 0.7 \text{ V}$, $V_{OH} = 5.5 \text{ V}$				0.25			
V_{OL}	$V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $V_{IL} = 0.8 \text{ V}$, $I_{OL} = 16 \text{ mA}$	0.2	0.4		0.2	0.4	V	
I_I	$V_{CC} = \text{MAX}$, $V_I = 5.5 \text{ V}$	1			1			mA
I_{IH}	$V_{CC} = \text{MAX}$, $V_I = 2.4 \text{ V}$	40			40			μA
I_{IL}	$V_{CC} = \text{MAX}$, $V_I = 0.4 \text{ V}$	-1.6			-1.6			mA
I_{CC}	$V_{CC} = \text{MAX}$. See Note 2	30	43		30	50	mA	

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

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

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, $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER [†]	FROM (INPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
		Other input low	Other input high				
[†] PLH	A or B	Other input low	$C_L = 15 \text{ pF}$, $R_L = 400 \Omega$, See Note 3	12	18	ns	
[†] PHL				39	50		
[†] PLH	A or B	Other input high	See Note 3	14	22	ns	
[†] PHL				42	55		

[†]PLH propagation delay time, low-to-high-level output

[†]PHL propagation delay time, high-to-low-level output

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

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TTL Devices

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

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

Supply voltage, V_{CC} (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

	SN54LS136			SN74LS136			UNIT	
	MIN	NOM	MAX	MIN	NOM	MAX		
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V	
High-level output voltage, V_{OH}	5.5			5.5			V	
Low-level output current, I_{OL}	4			8			mA	
Operating free-air temperature, T_A	-55			0			70	C

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

PARAMETER	TEST CONDITIONS†	SN54LS136			SN74LS136			UNIT	
		MIN	TYP‡	MAX	MIN	TYP‡	MAX		
V_{IH} High-level input voltage		2			2			V	
V_{IL} Low-level input voltage		0.7			0.8			V	
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$	-1.5			-1.5			V	
I_{OH} High-level output current	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}, V_{OH} = 5.5 \text{ V}$	100			100			μA	
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 4 \text{ mA}$	0.25	0.4	0.25	0.4	V		
		$I_{OL} = 8 \text{ mA}$			0.35	0.5			
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7 \text{ V}$	0.2			0.2			mA	
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$	40			40			μA	
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$	-0.8			-0.8			mA	
I_{CC} Supply current	$V_{CC} = \text{MAX},$ See Note 2	6.1			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 $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$

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, $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$

PARAMETER‡	FROM (INPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	A or B	Other input low	$C_L = 15 \text{ pF}, R_L = 2 \text{ k}\Omega,$ (See Note 3)	18	30	ns	
t_{PHL}				18	30		
t_{PLH}	A or B	Other input high		18	30	ns	
t_{PHL}				18	30		

† t_{PLH} propagation delay time, low-to-high-level output

‡ t_{PHL} propagation delay time, high-to-low-level output

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

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TTL Devices