

74S135
Gate

Quad Exclusive OR/NOR Gate
Product Specification

Logic Products

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74S135	9ns	65mA

FUNCTION TABLE

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

H = HIGH voltage level
L = LOW voltage level

ORDERING CODE

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 5\%$; $T_A = 0^\circ C$ to $+70^\circ C$
Plastic DIP	N74S135N

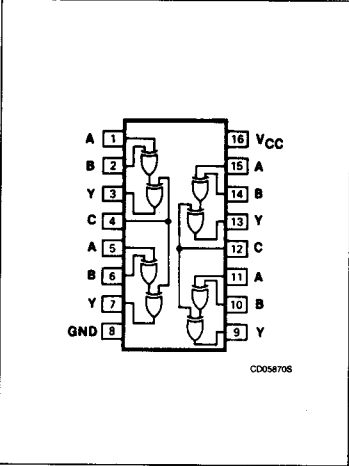
NOTE:
For information regarding devices processed to Military Specifications, see the Signetics Military Products Data Manual.

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

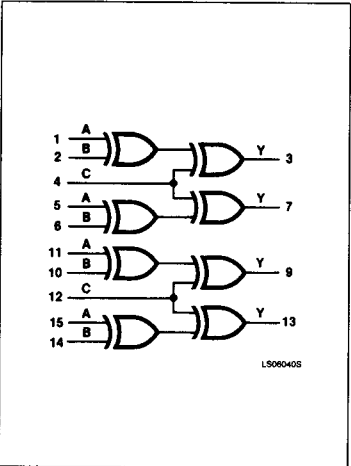
PINS	DESCRIPTION	74S
All	Inputs	1Sul
All	Outputs	10Sul

NOTE:
A 74S unit load (Sul) is understood to be $50\mu A$ I_{IH} and $-2.0mA$ I_{IL} .

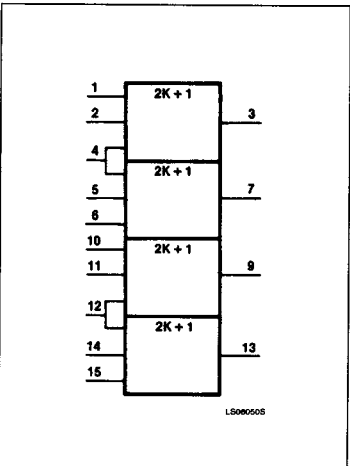
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



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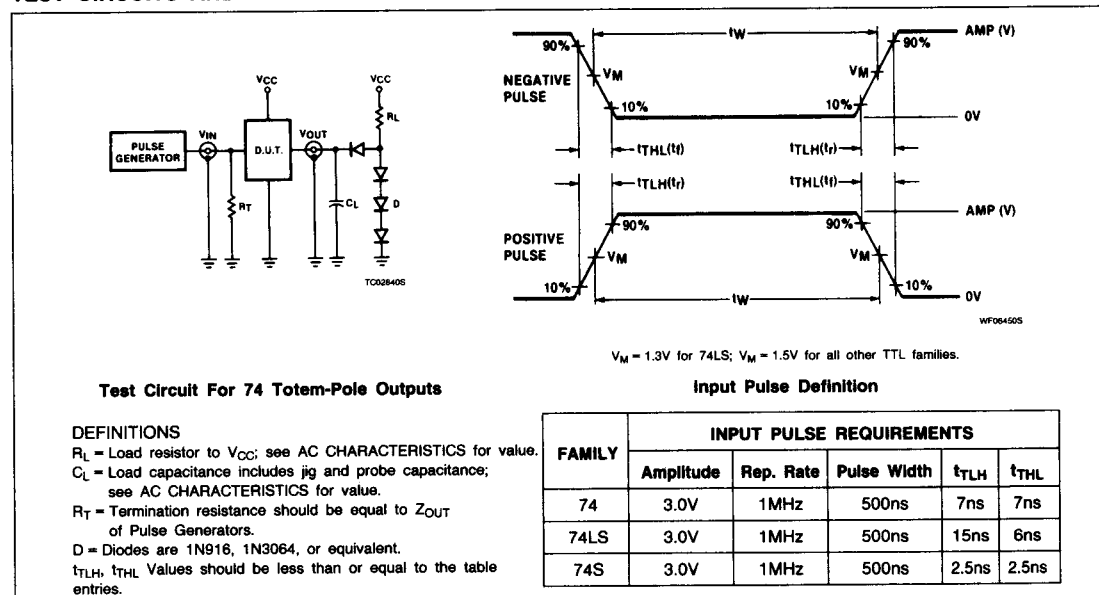
ABSOLUTE MAXIMUM RATINGS (Over operating free-air temperature range unless otherwise noted.)

PARAMETER		74S	UNIT
V_{CC}	Supply voltage	7.0	V
V_{IN}	Input voltage	-0.5 to +5.5	V
I_{IN}	Input current	-30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state	-0.5 to + V_{CC}	V
T_A	Operating free-air temperature range	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER		74S			UNIT
		Min	Nom	Max	
V_{CC}	Supply voltage	4.75	5.0	5.25	V
V_{IH}	HIGH-level input voltage	2.0			V
V_{IL}	LOW-level input voltage			+0.8	V
I_{IK}	Input clamp current			-18	mA
I_{OH}	HIGH-level output current			-1000	μA
I_{OL}	LOW-level output current			20	mA
T_A	Operating free-air temperature	0		70	°C

TEST CIRCUITS AND WAVEFORMS



Gate

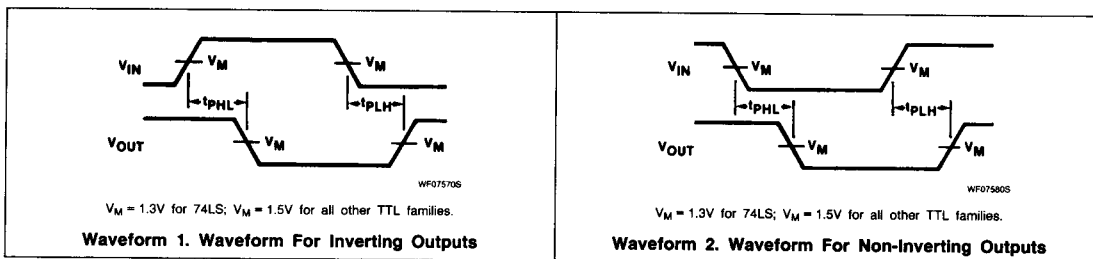
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DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER	TEST CONDITIONS ¹	74S135			UNIT
		Min	Typ ²	Max	
V_{OH} HIGH-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}, I_{OH} = \text{MAX}$	2.7	3.4		V
V_{OL} LOW-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}, I_{OL} = \text{MAX}$			0.5	V
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = I_{IK}$			-1.2	V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5\text{V}$			1.0	mA
I_{IH} HIGH-level input current	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$			50	μA
I_{IL} LOW-level input current	$V_{CC} = \text{MAX}, V_I = 0.5\text{V}$			-2	mA
I_{OS} Short-circuit output current ³	$V_{CC} = \text{MAX}$	-40		-100	mA
I_{CC} Supply current ⁴ (total)	$V_{CC} = \text{MAX}$		65	99	mA

NOTES:

- 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 $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.
- I_{OS} is tested with $V_{OUT} = +0.5\text{V}$ and $V_{CC} = V_{CC} \text{ MAX} + 0.5\text{V}$. Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.
- Measure I_{CC} with the inputs grounded and the outputs open.

AC WAVEFORMS**AC ELECTRICAL CHARACTERISTICS** $T_A = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$

PARAMETER		TEST CONDITIONS	74S		UNIT
			$C_L = 15\text{pF}, R_L = 280\Omega$		
			Min	Max	
t_{PLH} t_{PHL}	Propagation delay A or B to output	Waveform 2, C = LOW, B or A = LOW		13 15	ns
t_{PLH} t_{PHL}	Propagation delay A or B to output	Waveform 1, C = LOW, B or A = HIGH		12 13.5	ns
t_{PLH} t_{PHL}	Propagation delay A or B to output	Waveform 1, C = HIGH, B or A = LOW		15 10	ns
t_{PLH} t_{PHL}	Propagation delay A or B to output	Waveform 2, C = HIGH, B or A = HIGH		12 11	ns
t_{PLH} t_{PHL}	Propagation delay C to output	Waveform 2, A = B		12 14.5	ns
t_{PLH} t_{PHL}	Propagation delay C to output	Waveform 1, A $\neq$ B		11.5 12	ns