

7439 Buffer

Quad Two-Input NAND Buffer (Open Collector)
Product Specification

Logic Products

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
7439	11ns	4.5mA (I_{CCH}) 30mA (I_{CCL})

ORDERING CODE

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 5\%$; $T_A = 0^\circ C$ to $+70^\circ C$
Plastic DIP	N7439N

NOTE:

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

FUNCTION TABLE

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

H = HIGH voltage level
L = LOW voltage level

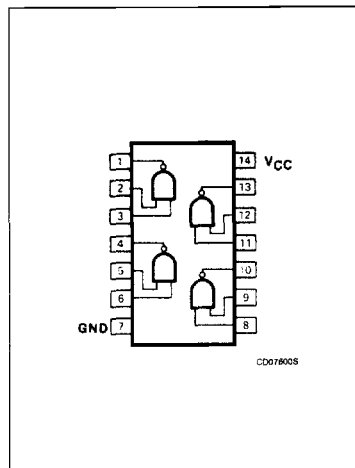
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74
A, B	Inputs	1ul
Y	Output	30ul

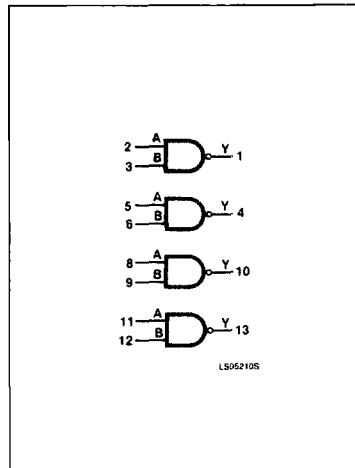
NOTE:

A 74 unit load (ul) is understood to be $40\mu A I_{IH}$ and $-1.6mA I_{IL}$.

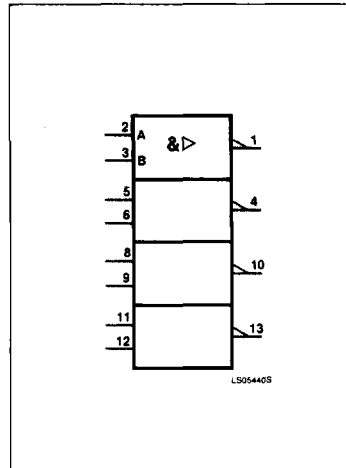
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



Buffer

7439

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

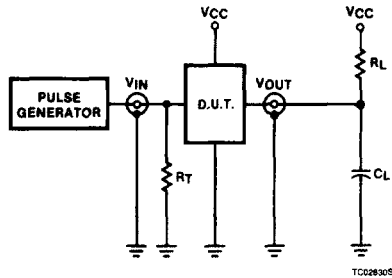
PARAMETER		74	UNIT
V _{CC}	Supply voltage	7.0	V
V _{IN}	Input voltage	-0.5 to +5.5	V
I _{IN}	Input current	-30 to +5	mA
V _{OUT}	Voltage applied to output in HIGH output state	-0.5 to +V _{CC}	V
T _A	Operating free-air temperature range	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

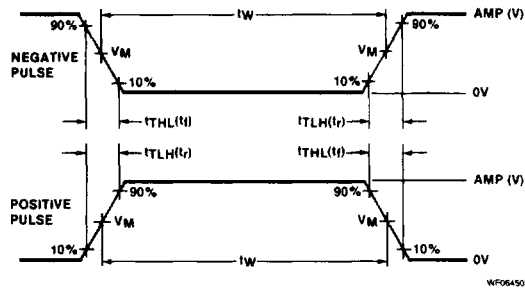
PARAMETER	74			UNIT	
	Min	Nom	Max		
V _{CC}	Supply voltage	4.75	5.0	5.25	V
V _{IH}	HIGH-level input voltage	2.0			V
V _{IL}	LOW-level input voltage			+0.8	V
I _{IK}	Input clamp current			-12	mA
V _{OH}	HIGH-level output current			5.5	V
I _{OL}	LOW-level output current			48	mA
T _A	Operating free-air temperature	0		70	°C

5

TEST CIRCUITS AND WAVEFORMS



Test Circuit For 74
Open Collector Outputs



V_M = 1.3V for 74LS; V_M = 1.5V for all other TTL families.

Input Pulse Definition

DEFINITIONS

R_L = Load resistor to V_{CC}; see AC CHARACTERISTICS for value.

C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.

R_T = Termination resistance should be equal to Z_{OUT} of Pulse Generators.

t_{TLH}, t_{THL} Values should be less than or equal to the table entries.

FAMILY	INPUT PULSE REQUIREMENTS				
	Amplitude	Rep. Rate	Pulse Width	t _{TLH}	t _{THL}
74	3.0V	1MHz	500ns	7ns	7ns
74LS	3.0V	1MHz	500ns	15ns	6ns
74S	3.0V	1MHz	500ns	2.5ns	2.5ns

Buffer

7439

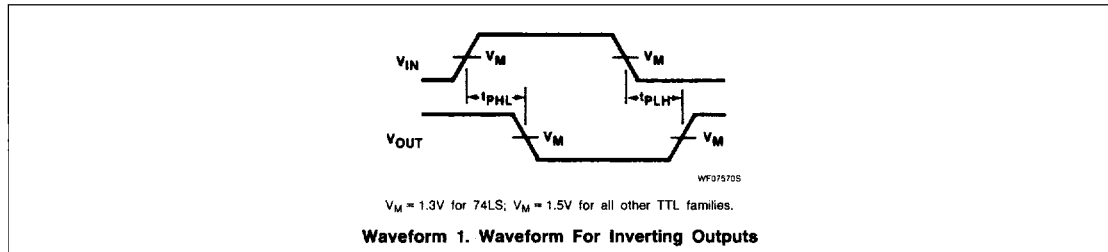
DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER	TEST CONDITIONS ¹	7439			UNIT	
		Min	Typ ²	Max		
I_{OH} HIGH-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}, V_{OH} = 5.5\text{V}$			250	μA	
V_{OL} LOW-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, I_{OL} = \text{MAX}$		0.2	0.4	V	
V_{IK} Input clamp voltage	$V_{CC} = \text{MIN}, I_I = I_{IK}$			-1.5	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	$V_{CC} = \text{MAX}, V_I = 2.4\text{V}$			40	μA	
I_{IL} LOW-level input current	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$			-1.6	mA	
I_{CC} Supply current (total)	$V_{CC} = \text{MAX}$	I_{CCH} Output HIGH		4.5	8.5	mA
		I_{CCL} Outputs LOW		30	54	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 $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}$.

AC WAVEFORM



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

PARAMETER	TEST CONDITIONS	74		UNIT
		$C_L = 45\text{pF}, R_L = 133\Omega$		
		Min	Max	
t_{PLH} t_{PHL} Propagation delay	Waveform 1		22 18	ns