

7416, 17 Inverter/Buffer/Drivers

'16 Hex Inverter Buffer/Driver (Open Collector)

'17 Hex Buffer/Driver (Open Collector)

Product Specification

Logic Products

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
7416	10ns (t _{PLH}) 15ns (t _{PHL})	31mA
7417	6ns (t _{PLH}) 20ns (t _{PHL})	25mA

ORDERING CODE

PACKAGES	COMMERCIAL RANGE V _{CC} = 5V ±5%; T _A = 0°C to +70°C
Plastic DIP	N7416N, N7417N
Plastic SO	N7417D

NOTE:

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

FUNCTION TABLE

'16		'17	
INPUT	OUTPUT	INPUT	OUTPUT
A	Y	A	Y
L	H	L	L
H	L	H	H

H = HIGH voltage level
L = LOW voltage level

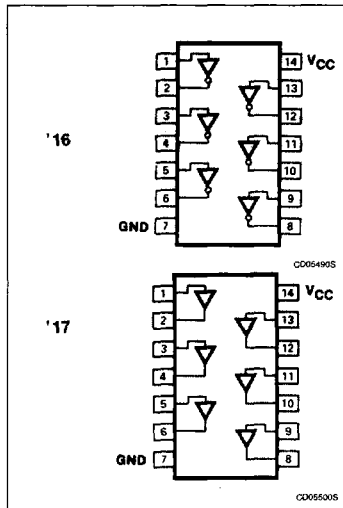
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74
A	Input	1ul
Y	Output	10ul

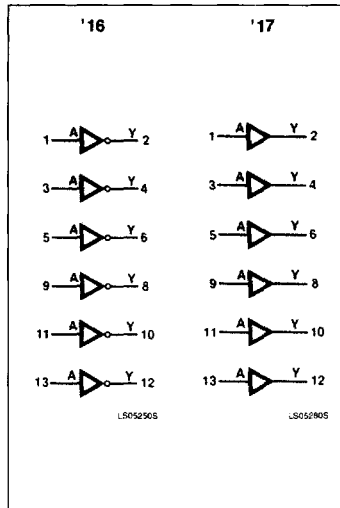
NOTE:

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

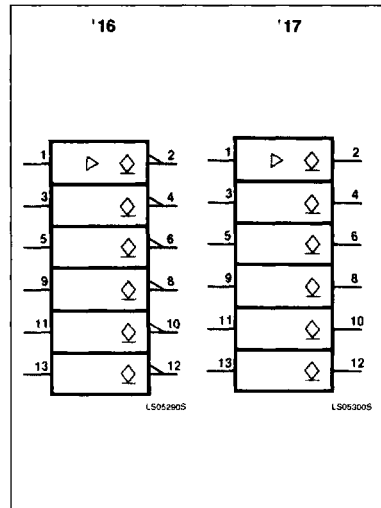
PIN CONFIGURATION



LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



Inverter/Buffer/Drivers

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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 +15	V
T _A	Operating free-air temperature range	0 to 70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER	74			UNIT
	Min	Nom	Max	
V _{CC}	4.75	5.0	5.25	V
V _{IH}	2.0			V
V _{IL}			+0.8	V
I _{IK}			-12	mA
V _{OH}			15	V
I _{OL}			40	mA
T _A	0		70	°C

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TEST CIRCUITS AND WAVEFORMS

Test Circuit For 74 Open Collector Outputs

Input Pulse Definition

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

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.

D = Diodes are 1N916, 1N3064, or equivalent.

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

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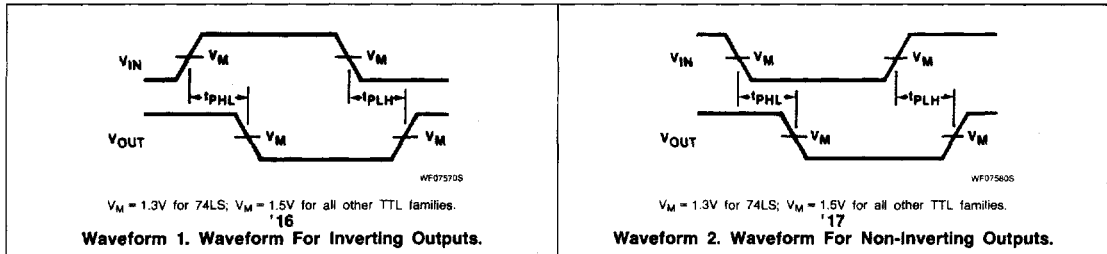
DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

PARAMETER	TEST CONDITIONS ¹	7416, 7417			UNIT	
		Min	Typ ²	Max		
I_{OH} HIGH-level output current	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}, V_{OH} = 15\text{V}$			250	μA	
V_{OL} LOW-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}$	$I_{OL} = 16\text{mA}$		0.4	V	
		$I_{OL} = 30\text{mA}$				
		$I_{OL} = 40\text{mA}$		0.7	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} Outputs HIGH	'16	30	48	mA
		I_{CCL} Outputs LOW		32	51	mA
		I_{CCH} Outputs HIGH	'17	29	41	mA
		I_{CCL} Outputs LOW		21	30	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 WAVEFORMS



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

PARAMETER	TEST CONDITIONS	7416		7417		UNIT
		$C_L = 15\text{pF}, R_L = 110\Omega$		$C_L = 15\text{pF}, R_L = 110\Omega$		
		Min	Max	Min	Max	
t_{PLH} t_{PHL} Propagation delay	Waveform 1, '16 Waveform 2, '17		15 23		10 30	ns