

7445 Decoder/Driver

BCD-To-Decimal Decoder/Driver (Open Collector)
Product Specification

Logic Products

FEATURES

- 80mA output sink capability
- 30V output breakdown voltage
- Ideally suited as lamp or solenoid driver
- See '42 for standard TTL output version
- See '145 for "LS" version

DESCRIPTION

The '45 decoder accepts BCD inputs on the A_0 to A_3 address lines and generates 10 mutually exclusive active LOW outputs. When an input code greater than "9" is applied, all outputs are off. This device can therefore be used as a 1-of-8 decoder with A_3 used as an active LOW enable.

The '45 can sink 20mA while maintaining the standardized guaranteed output LOW voltage (V_{OL}) of 0.4V, but it can sink up to 80mA with a guaranteed V_{OL} of less than 0.9V.

The '45 features an output breakdown voltage of 30V and is ideally suited as a lamp or solenoid driver.

TYPE	MAX I_{OL}	TYPICAL SUPPLY CURRENT (TOTAL)
7445	80mA	43mA

ORDERING CODE

PACKAGES	COMMERCIAL RANGE $V_{CC} = 5V \pm 5\%$; $T_A = 0^\circ C$ to $+70^\circ C$
Plastic DIP	N7445N

NOTE:

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

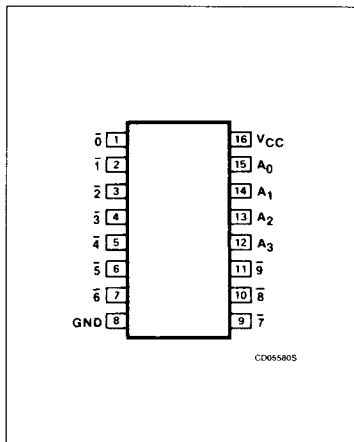
INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74
$A_0 - A_3$	Inputs	1uI
$\bar{0} - \bar{9}$	Outputs	12.5uI

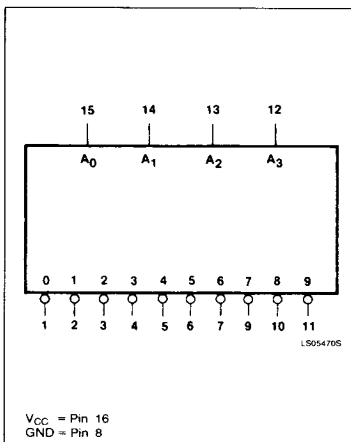
NOTE:

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

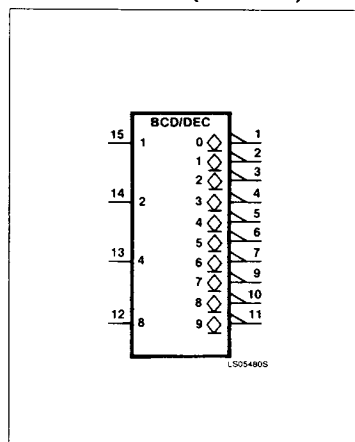
PIN CONFIGURATION



LOGIC SYMBOL



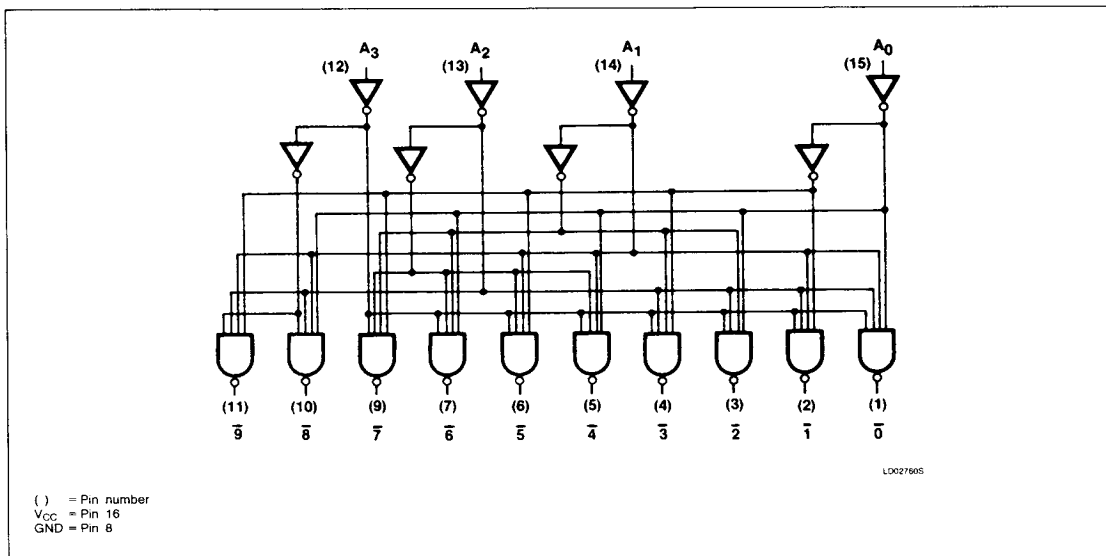
LOGIC SYMBOL (IEEE/IEC)



Decoder/Driver

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LOGIC DIAGRAM



FUNCTION TABLE

A ₃	A ₂	A ₁	A ₀	0	1	2	3	4	5	6	7	8	9
L	L	L	L	L	H	H	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	H	H	H
L	L	H	L	H	H	L	H	H	H	H	H	H	H
L	L	H	H	H	H	H	L	H	H	H	H	H	H
L	H	L	L	H	H	H	H	H	L	H	H	H	H
L	H	L	H	H	H	H	H	H	H	L	H	H	H
L	H	H	L	H	H	H	H	H	H	H	L	H	H
L	H	H	H	H	H	H	H	H	H	H	H	L	H
H	L	L	L	H	H	H	H	H	H	H	H	H	L
H	L	L	H	H	H	H	H	H	H	H	H	H	H
H	L	H	L	H	H	H	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H	H	H	H	H
H	H	L	L	H	H	H	H	H	H	H	H	H	H
H	H	L	H	H	H	H	H	H	H	H	H	H	H
H	H	H	L	H	H	H	H	H	H	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H

H = HIGH voltage levels

L = LOW voltage levels

Decoder/Driver

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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 +30	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 voltage			30	V
I_{OL}	LOW-level output current			80	mA
T_A	Operating free-air temperature	0		70	°C

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

PARAMETER	TEST CONDITIONS ¹		7445			UNIT
			Min	Typ ²	Max	
I_{OH}	HIGH-level output current	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}, V_{OH} = 30V$			250	μA
V_{OL}	LOW-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = \text{MIN}, V_{IL} = \text{MAX}$			0.4	V
		$I_{OL} = 20\text{mA}$				
		$I_{OL} = 80\text{mA}$		0.5	0.9	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	$V_{CC} = \text{MAX}, V_I = 5.5V$			1.0	mA
I_{IH}	HIGH-level input current	$V_{CC} = \text{MAX}, V_I = 2.4V$			40	μA
I_{IL}	LOW-level input current	$V_{CC} = \text{MAX}, V_I = 0.4V$			-1.6	mA
I_{CC}	Supply current ³ (total)	$V_{CC} = \text{MAX}$		43	70	mA

NOTES:

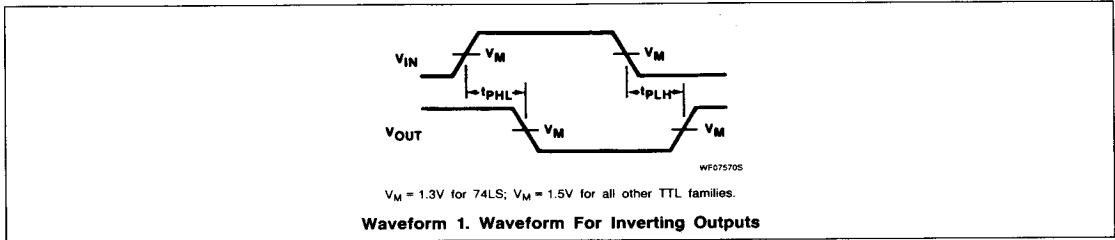
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.

2. All typical values are at $V_{CC} = 5V, T_A = 25^\circ C$.3. Measure I_{CC} with all inputs grounded and outputs open.

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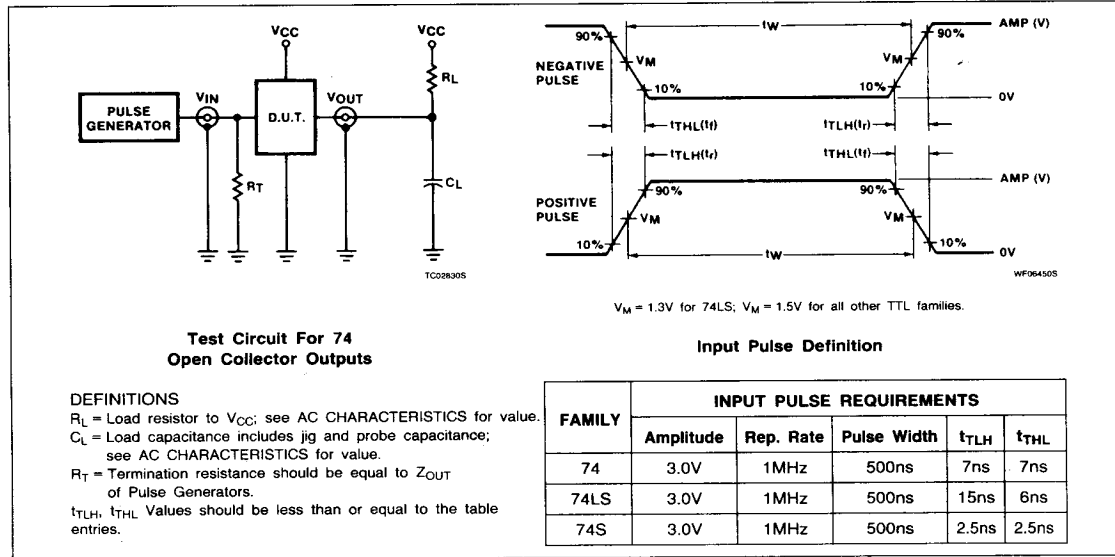
AC WAVEFORM



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

PARAMETER		TEST CONDITIONS	74		UNIT
			C _L = 15pF, R _L = 100Ω		
			Min	Max	
t _{PLH}	Propagation delay	Waveform 1		50	ns
t _{PHL}	Address to output			50	

TEST CIRCUITS AND WAVEFORMS



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