

HEX SCHMITT-TRIGGER INVERTERS

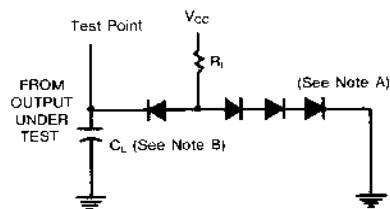
Description

This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.

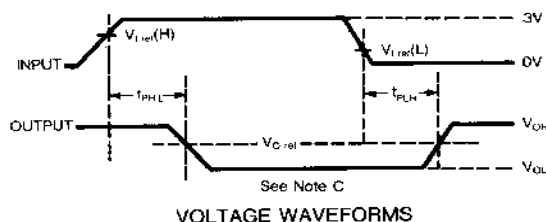
Function Table (each inverter)

INPUT	OUTPUT
A	Y
L	H
H	L

Parameter Measurement Information



Load Circuit



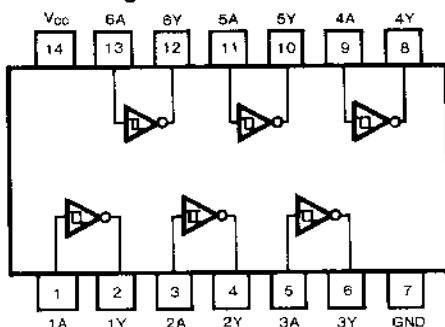
Note: A. All diodes are IN916 or IN3064

B. C. includes probe and jig capacitance

Absolute Maximum Ratings

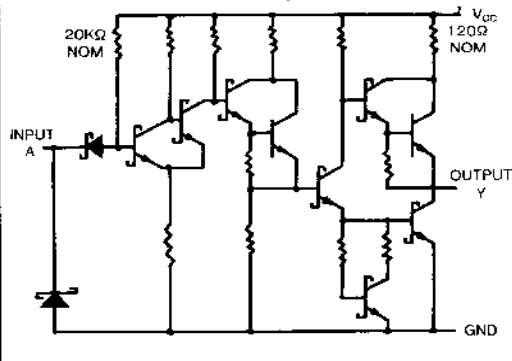
- | | |
|--|----------------|
| • Supply voltage, Vcc | 7V |
| • Input voltage | 7V |
| • Operating free-air temperature range 54LS | -55°C to 125°C |
| 74LS | 0°C to 70°C |
| • Storage temperature range | -65°C to 150°C |

Pin Configuration



Suffix-Blank: Plastic Dual In Line Package
Suffix-J : Ceramic Dual In Line Package

Circuit Schematics (each inverter)



Note C: Generator characteristics and reference voltage are

Generator Characteristics				Reference Voltage		
Z _{OUT}	PRR	tr	tf	V _I ref(H)	V _I ref(L)	V _O ref
50Ω	1MHz	15ns	6ns	1.6V	0.8V	1.3V

Recommended Operating Conditions

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I_{OH}	High-level output current	54, 74			-400	μA
I_{OL}	Low-level output current	54			4	mA
		74			8	
T_A	Operating free-air temperature	54	-55		125	$^{\circ}C$
		74	0		70	

Electrical Characteristics over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP (Note 1)	MAX	UNIT
V_{T+}	Positive-Going Input Threshold Voltage (Note 1)	$V_{CC}=5V$	1.4	1.6	1.9	V
V_{T-}	Negative-Going Input Threshold Voltage (Note 1)	$V_{CC}=5V$	0.5	0.8	1	V
V_{IK}	Input clamp voltage	$V_{CC}=\text{Min}, I_I=-18mA$			-1.5	V
$V_{T+}-V_{T-}$	Input Hysteresis (Note 1)	$V_{CC}=5V$	0.4	0.8		V
V_{OH}	High-level output voltage	$V_{CC}=\text{Min}$ $I_{OH}=\text{Max}$ $V_I=V_{T-}\text{Min}$	54 74	2.5 2.7	3.4 3.4	V
V_{OL}	Low-level output voltage	$V_{CC}=\text{Min}$ $V_I=V_{T+}\text{Max}$ $I_{OL}=4mA$	54, 74		0.25	V
		$I_{OL}=8mA$	74		0.35	
I_{T+}	Input Current at Positive-Going Threshold	$V_{CC}=5V, V_I=V_{T+}$		-0.14		mA
I_{T-}	Input Current at Negative-Going Threshold	$V_{CC}=5V, V_I=V_{T-}$		-0.18		mA
I_I	Input current at maximum input voltage	$V_{CC}=\text{Max}, V_I=7V$			0.1	mA
I_{IH}	High-level input current	$V_{CC}=\text{Max}, V_I=2.7V$			20	μA
I_{IL}	Low-level input current	$V_{CC}=\text{Max}, V_I=0.4V$			-0.4	mA
I_{OS}	Short-circuit output current	$V_{CC}=\text{Max}$ (Note 2)	-20		-100	mA
I_{CCH}	Supply current	Total with outputs high $V_{CC}=\text{Max}$		8.6	16	mA
I_{CCL}		Total with outputs low $V_{CC}=\text{Max}$		12	21	mA

Note 1: All typical values are at $V_{CC}=5V, T_A=25^{\circ}C$.

Note 2: Note more than one output should be shorted at a time, and the duration should not exceed one second.

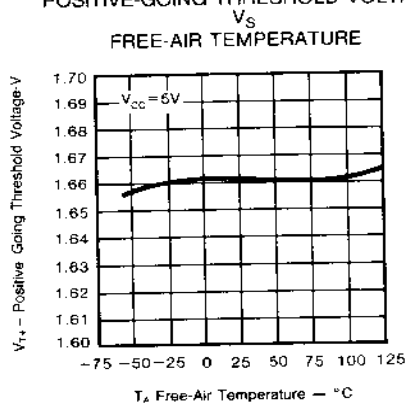
Switching Characteristics, $V_{CC}=5V, T_A=25^{\circ}C$

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L=15pF, R_L=2k\Omega$		15	22	ns
t_{PHL}	Propagation delay time, high-to-low-level output			15	22	ns

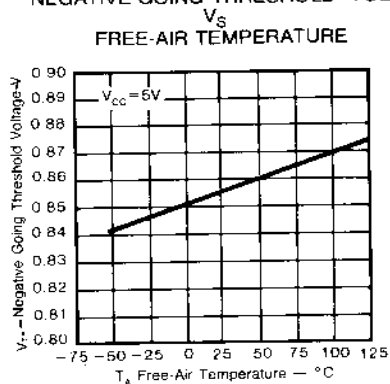
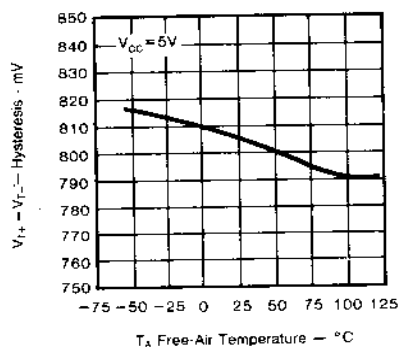
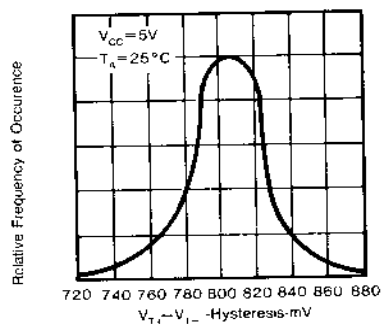
#For load circuit and voltage waveforms, see page 3-11.

Typical Characteristics

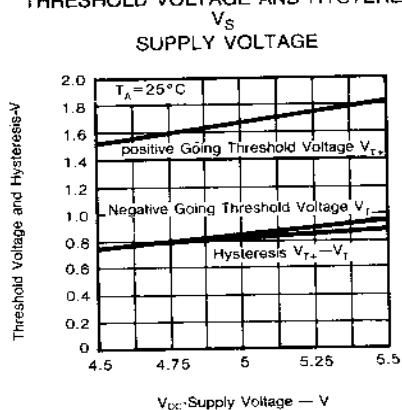
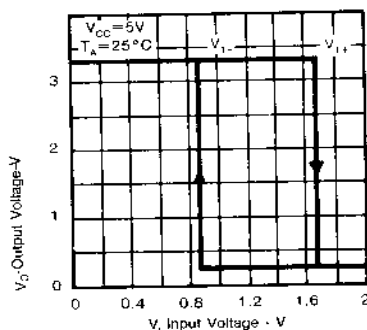
POSITIVE-GOING THRESHOLD VOLTAGE



NEGATIVE-GOING THRESHOLD VOLTAGE

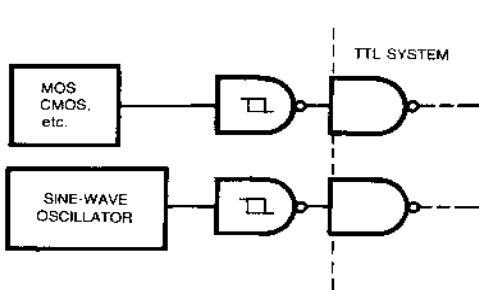
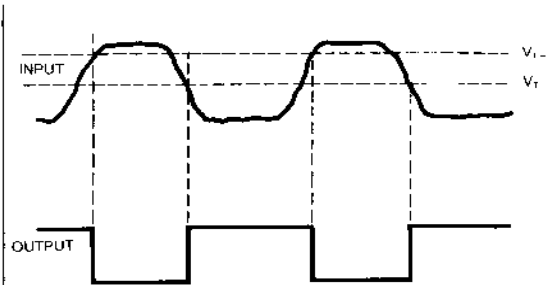
HYSTERESIS
 V_S
FREE-AIR TEMPERATUREDISTRIBUTION OF UNIT
 V_S
FOR HYSTERESIS

THRESHOLD VOLTAGE AND HYSTERESIS

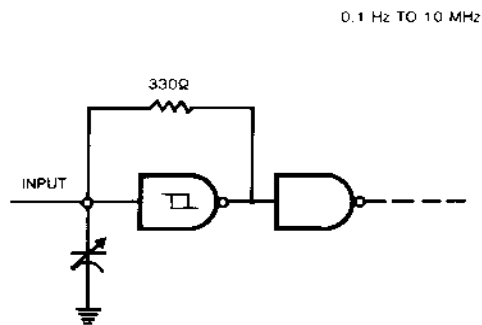
OUTPUT VOLTAGE
 V_S
INPUT VOLTAGE

Typical Application Data

TYPICAL APPLICATION DATA

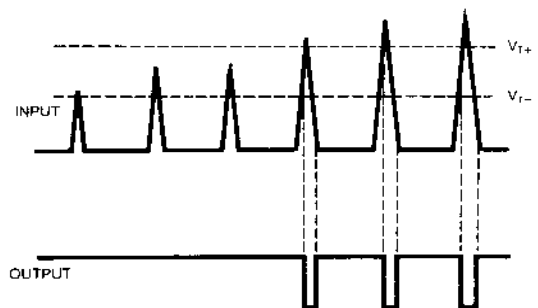
TTL SYSTEM INTERFACE
FOR SLOW INPUT WAVEFORMS

PULSE SHAPER

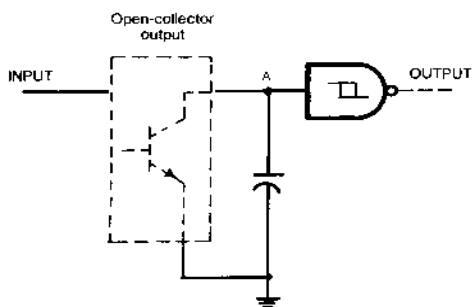


MULTIVIBRATOR

0.1 Hz TO 10 MHz



THRESHOLD DETECTOR



PULSE STRETCHER

