

### DIGITAL 54/74 TTL SERIES

#### FEATURES

##### N74S11 ACTIVE PULL-UP

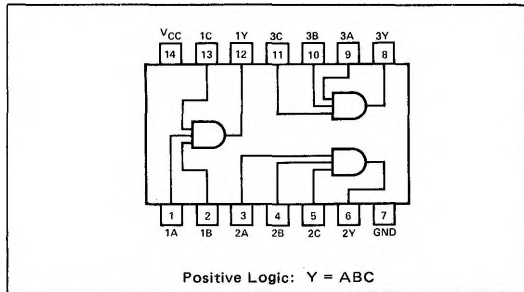
- TYPICAL PROPAGATION TIME
- TYPICAL POWER DISSIPATION AT 50% DUTY CYCLE

5 ns at  $C_L = \text{pF}$   
32 mW PER GATE

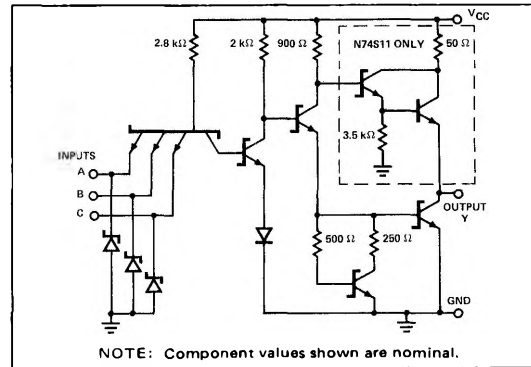
##### N74S15 OPEN-COLLECTOR

- TYPICAL PROPAGATION TIME
- TYPICAL POWER DISSIPATION AT 50% DUTY CYCLE

6 ns at  $C_L = 15 \text{ pF}$   
29 mW PER GATE



#### SCHEMATIC (each gate)



#### RECOMMENDED MAXIMUM FAN-OUT FROM EACH OUTPUT

	N74S11	N74S15
Loads at a high logic level	20	10
Loads at a low logic level	10	10

#### ELECTRICAL CHARACTERISTICS (over operating free-air temperature range unless otherwise noted)

PARAMETER	TEST CONDITIONS*	N74S11			N74S15			UNIT
		MIN	TYP**	MAX	MIN	TYP**	MAX	
$V_{IH}$ High-level input voltage		2			2			V
$V_{IL}$ Low-level input voltage				0.8			0.8	V
$V_I$ Input clamp voltage	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$			-1.2			-1.2	V
$V_{OH}$ High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, I_{OH} = -1 \text{ mA}$	2.7	3.4					V
$I_{OH}$ High-level output current	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{OH} = 5.5 \text{ V}$					250		$\mu\text{A}$
$V_{OL}$ Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = 0.8 \text{ V}, I_{OL} = 20 \text{ mA}$			0.5		0.5		V
$I_I$ Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$			1		1		mA
$I_{IH}$ High-level input current (each input)	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$			50		50		$\mu\text{A}$
$I_{IL}$ Low-level input current (each input)	$V_{CC} = \text{MAX}, V_I = 0.5 \text{ V}$			-2		-2		mA
$I_{OS}$ Short-circuit output current ‡	$V_{CC} = \text{MAX}$	-40		-100				mA
$I_{CCH}$ Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX}, \text{ All inputs at } 5 \text{ V}$	4.5	8		3.5	6.5		mA
$I_{CCL}$ Supply current, low-level output (Average per gate)	$V_{CC} = \text{MAX}, \text{ All inputs at } 0 \text{ V}$	8	14		8	14		mA

\*For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable series on the second page of this section.

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

‡Not more than one output should be shorted at a time, and duration of the short-circuit test should not exceed one second.

#### SWITCHING CHARACTERISTICS, $V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}, N = 10$

PARAMETER	TEST CONDITIONS NOTE 1	N74S11			N74S15			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
$t_{PLH}$ Propagation delay time, low-to-high-level output	$C_L = 15 \text{ pF}, R_L = 280 \Omega$	2.5	4.5	7	2.5	5.5	8.5	ns
	$C_L = 50 \text{ pF}, R_L = 280 \Omega$		6			8.5		
$t_{PHL}$ Propagation delay time, high-to-low-level output	$C_L = 15 \text{ pF}, R_L = 280 \Omega$	2.5	5	7.5	2.5	6	9	ns
	$C_L = 50 \text{ pF}, R_L = 280 \Omega$		7.5			8		

NOTE 1: Load circuits and waveforms are shown on page 2-293