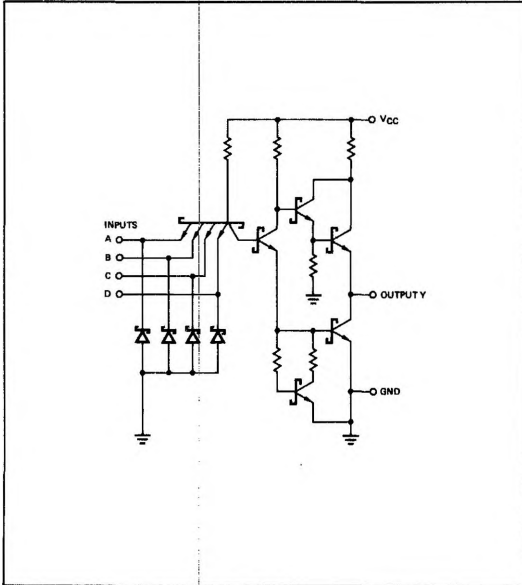


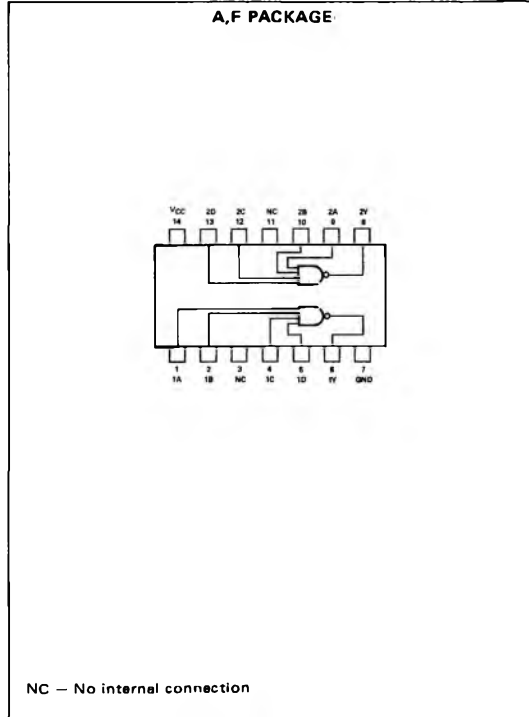
S54S40-A,F,W • S54S140-A,F,W • N74S40-A,F • N74S140-A,F

DIGITAL 54/74 TTL SERIES

**SCHEMATIC (each gate)**



**PIN CONFIGURATIONS**



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

Loads at a high logic level	60
Load at a low logic level	30

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

PARAMETER	TEST CONDITIONS*	MIN	TYP**	MAX	UNIT		
$V_{IH}$	High-level input voltage	2			V		
$V_{IL}$	Low-level input voltage			0.8	V		
$V_I$	Input clamp voltage			-1.2	V		
$V_{OH}$	High-level output voltage	$V_{CC} = \text{MIN},$ $V_{CC} = \text{MIN},$ $I_{OH} = -3\text{mA}$	$I_I = -18\text{mA}$ $V_{IL} = 0.8\text{V},$ Series 54S Series 74S	2.5 2.7	3.4 3.4	V	
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{MIN},$ $R_O = 50\Omega \text{ To GND}$	$V_I = 0.5\text{V},$ S54S140 N74S140	2		V	
$I_I$	Input current at maximum input voltage	$V_{CC} = \text{MIN},$ $I_{OL} = 60\text{mA}$	$V_{IH} = 2\text{V},$		0.5	V	
$I_{IH}$	High-level input current (each input)	$V_{CC} = \text{MAX},$	$V_I = 5.5\text{V}$		1	mA	
$I_{IL}$	Low-level input current (each input)	$V_{CC} = \text{MAX},$	$V_I = 2.7\text{V}$		100	$\mu\text{A}$	
$I_{OS}$	Short-circuit output current†	$V_{CC} = \text{MAX},$	$V_I = 0.5\text{V}$		-4	mA	
$I_{CCH}$	Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX},$	All inputs at 0V	-50	-225	mA	
$I_{CCL}$	Supply current, low-level output (average per gate)	$V_{CC} = \text{MAX},$	All inputs at 5V		5 12.5	9 22	mA

**DIGITAL 54/74 TTL SERIES ■ S54S40, N74S40, S54S140, N74S140**

**SWITCHING CHARACTERISTICS,  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ ,  $N = 30$**

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	Propagation delay time, low-to-high-level output	C <sub>L</sub> = 50pF, R <sub>L</sub> = 93Ω	NOTE 1	2	4	6.5	ns
		C <sub>L</sub> = 150pF, R <sub>L</sub> = 93Ω			6		ns
t <sub>PHL</sub>	Propagation delay time, high-to-low-level output	C <sub>L</sub> = 50pF, R <sub>L</sub> = 93Ω	NOTE 1	2	4	6.5	ns
		C <sub>L</sub> = 150pF, R <sub>L</sub> = 93Ω			6		ns

\* 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  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

† Not more than one output should be shorted at a time, and duration of the short-circuit test should not exceed 100 milliseconds.

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