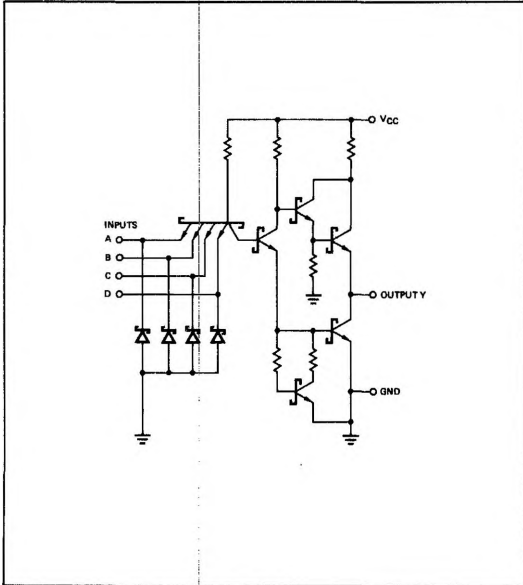


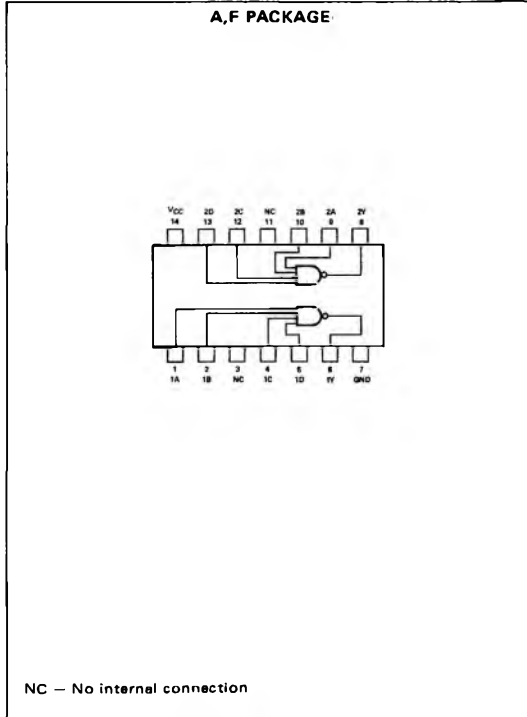
S54S40-A,F,W • S54S140-A,F,W • N74S40-A,F • N74S140-A,F

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	$V_{CC} = \text{MIN},$ $R_O = 50\Omega \text{ To GND}$	$V_I = 0.5\text{V},$ $V_{IH} = 2\text{V},$	S54S140 N74S140	2		V	
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX},$	$V_I = 5.5\text{V}$			1	mA	
I_{IH}	High-level input current (each input)	$V_{CC} = \text{MAX},$	$V_I = 2.7\text{V}$			100	μA	
I_{IL}	Low-level input current (each input)	$V_{CC} = \text{MAX},$	$V_I = 0.5\text{V}$			-4	mA	
I_{OS}	Short-circuit output current†	$V_{CC} = \text{MAX}$				-50	-225	mA
I_{CCH}	Supply current, high-level output (average per gate)	$V_{CC} = \text{MAX},$	All inputs at 0V			5	9	mA
I_{CCL}	Supply current, low-level output (average per gate)	$V_{CC} = \text{MAX},$	All inputs at 5V			12.5	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 _{PLH}	Propagation delay time, low-to-high-level output	C _L = 50pF, R _L = 93Ω	NOTE 1	2	4	6.5	ns
		C _L = 150pF, R _L = 93Ω			6		ns
t _{PHL}	Propagation delay time, high-to-low-level output	C _L = 50pF, R _L = 93Ω	NOTE 1	2	4	6.5	ns
		C _L = 150pF, R _L = 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